KNOWLEDGE, ATTITUDE, AND PRACTICES OF BIOMEDICAL WASTE MANAGEMENT AMONG HOUSEKEEPING STAFF OF A CORPORATE HOSPITAL

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ABSTRACT

Introduction

Biomedical waste is hospital waste containing infectious material, radioactive waste, and anatomical parts. COVID-19 has resulted in tons of biomedical waste. Inappropriate handling of this waste can lead to serious health problems and environmental issues.

Objective

The study focuses on the knowledge, attitude, and practices of biomedical waste management among the housekeeping staff of a corporate hospital in Hyderabad.

Methodology

An interview schedule was designed and administered to the housekeeping staff in the local language on various aspects of biomedical waste management knowledge, attitude, and practices. A comparison of KAP scores among the housekeeping staff with respect to different demographic profiles was done using ANOVA test.

Result

A significant difference in Knowledge, Attitude, and Practices scores was observed among different demographic groups of housekeeping staff.

Conclusion

The majority of the housekeeping staff showed average Knowledge, Attitude, and Practice scores. Continuous training programs can help in bridging this gap.

KEYWORDS: Biomedical waste, Knowledge, Attitude, and practices

INTRODUCTION

Rapid industrialization and population growth have led to the generation of a huge quantity of waste in India. This waste includes plastic, glass, organic waste, metals, textiles, paints, hospital waste, hazardous waste, and e-waste. Waste management is a strategy an organization uses to treat and dispose this waste. Modern waste management strategies are aimed toward sustainability.

The waste generated from healthcare facilities is termed biomedical waste. It includes general waste, infectious waste, pharmaceutical waste, chemical waste, and sharps. This waste is capable of causing infections and injury if not handled properly. Proper management and disposal of biomedical waste is a very important aspect of environmental protection. 80-85% of this biomedical waste is non-hazardous. The remaining 10-15% is hazardous and needs special attention. Exposure to this waste can affect doctors, nurses, technicians, housekeeping staff, workers at the waste disposal facility, patients, visitors, and the general public. Further, improper segregation and treatment increase the chances of syringes and needles being reused. To address this issue, Biomedical waste (management and handling) rules were enacted in the year 1998. The was further amended in the year 2016. All healthcare establishments generating biomedical waste are covered under these rules.

REVIEW OF LITERATURE

According to Sandeep Boora et al (2020), Hospital administration plays an important role in containing COVID-19. It includes monitoring biomedical waste, training the staff, providing PPEs, developing infrastructure to augment critical care, evolving infection control policies, establishing a triage system, conducting mock drills, and preventing nosocomial infections.

According to K Deepika(2019), Housekeeping staff had inadequate knowledge and poor practices of biomedical waste management.

Rao D. et al conducted a study on Knowledge, Attitude, and Practices of biomedical waste management among healthcare workers at a teaching hospital in Mysuru(2018). Gaps were observed in all cadres. Doctors had the best knowledge scores, whereas nurses and technicians exhibited best practices. The Knowledge and Attitude scores were the lowest among housekeeping staff. Priya Dutta(2018) emphasizes that biomedical waste management is teamwork.

According to Ajai Singh and Rajeshwar Nath Srivastava (2013), doctors are more focused on curative aspects of the patient and are less focused on support services like waste segregation. Nurses have a better understanding and are more responsible in the implementation of biomedical waste disposal.

The Knowledge, Attitude, and Practice (KAP) model is a rational model in health education. It is based on the notion that increasing personal knowledge will influence behavior change (WHO 2012).

Proper handling, treatment, and disposal of biomedical waste management is an important element of the infection control programme (Veda Hegde, 2007).

Segregation of infectious and non-infectious waste and quantifying them is very important (Gayathri Patil and Kamala Pokhrel, 2005). It helps in reducing the burden on the environment and the chances of being mixed up with municipal waste.

The main purpose of KAP is to explore the level of knowledge, attitude, and practices of a community (K. Kaliyaperumal, 2004).

As per the findings of the literature review, it is identified that only a few studies on biomedical waste management are conducted in Hyderabad, and Housekeeping staff being an important section of healthcare workers, require special attention.

RESEARCH METHODOLOGY
Objectives
The study has the following as its objectives
- To study the Knowledge, Attitude, and Practices of Biomedical Waste Management among housekeeping staff of a corporate hospital
- To analyze the difference in Knowledge, Attitude, and Practices of Biomedical Waste Management among the demographic groups of housekeeping staff.

Sources of Data
The study includes both primary data and secondary data. Primary data was collected using an interview schedule. The interview schedule was designed for the housekeeping staff based on the inputs of experts in the field of biomedical waste management. The interview schedule consisted of four sections. Section A has demographic information, and sections B, C, and D have questions on various aspects of biomedical waste management knowledge, attitude, and practices respectively.
Secondary data was collected from various books, journals, theses, and reports.

Sample design
A simple random sampling method was used for this study. Housekeeping staff posted in all departments and working in different shifts were included in the study.

Sample Size
The interview schedule was administered to 80 housekeeping staff in the local language. Before administering this, the purpose of the study was explained to the housekeeping staff.

Scope of the Study
The study is confined to the housekeeping staff of a corporate hospital in Hyderabad.

Statistical tools used
The demographic data were tabulated systematically. ANOVA was used to test the hypotheses.

DATA ANALYSIS
Demographic profile of House Keeping Staff
Demographic information defines an individual or a population. These are independent variables. This interview schedule has 8 demographic variables such as age, gender, qualification, working department, working hours per day, experience, marital status, and monthly income.

Table 1: Age-wise distribution of housekeeping staff

Age	Frequency	Percentage
Less than 25 years	10	12.4
25-35 years	43	53.8
35-45 years	19	23.8
More than 45 years	8	10.0
Total	**80**	**100.0**

Source: Primary Data

An analysis of the data furnished in Table 1 shows the age-wise distribution of the housekeeping staff. The majority of the respondents are in the age group of 25-35 years, followed by the age groups 35-45 years, less than 25 years, and more than 45 years.

Table 2:Gender-wise distribution of housekeeping staff

Gender	Frequency	Percentage
Male	34	42.5
Female	46	57.5
Total	**80**	**100.0**

Source: Primary Data

An analysis of the data furnished in Table 2 shows the gender-wise distribution of housekeeping staff. From the table, it is clear that 57.5 percent of the respondents are females and 42.5 percent of the respondents are males.

Table 3: Educational Qualification-wise distribution of housekeeping staff

Educational Qualification	Frequency	Percentage
Below 10th	80	100.0
Up to 12th	0	0
Graduate	0	0
Total	**80**	**100.0**

Source: Primary Data

An analysis of the data furnished in table 3 shows the educational qualification-wise distribution of housekeeping staff. All the respondents had an educational qualification of less than standard 10th.

Table 4: Working Department-wise distribution of housekeeping staff

Working Department	Frequency	Percentage
OPD	17	21.3
ICU	16	20.0
OT	10	12.5
Wards	37	46.3
Total	**80**	**100.0**

Source: Primary Data

Table 4 indicates the working department-wise distribution of housekeeping staff. The majority of the respondents were posted in in-patient wards (46.3%), followed by the outpatient department (21.3%), intensive care unit (20%), and operation theatre (12.5%).

Table 5: Distribution of housekeeping staff by their working hours in a day

Working hours per day	Frequency	Percentage
Less than 8 hours	0	0
8 hours	51	63.8
More than 8 hours	29	36.2
Total	**80**	**100.0**

Source: Primary Data

Table 5 shows the distribution of housekeeping staff by their working hours per day. It is noticed that out of the total respondents, the majority of the staff (63.8%) had a working shift of 8 hours. Remaining 36.3% work for more than 8 hours a day. None of the respondents worked for less than 8 hours a day.

Table 6: Distribution of housekeeping staff by their years of experience in the field

Years of Experience	Frequency	Percentage
Less than 2 years	8	10.0
2-5 years	36	45.0
5-10 years	28	35.0
More than 10 years	8	10.0
Total	**80**	**100.0**

Source: Primary Data

Table 6 indicates the distribution of housekeeping staff by their years of experience in the field. As per the occupational experience, the majority (45%) had an experience of 2-5 years, followed by 5-10 years (35%), less than 2 years, and more than 10 years.

Table 7: Marital status-wise distribution of housekeeping staff

Marital Status	Frequency	Percentage
Single	14	17.5
Married	66	82.5
Total	**80**	**100.0**

Source: Primary Data

Table 7 shows the distribution of housekeeping staff according to their marital status. The majority (82.5 %) of the housekeeping staff are married.

Table 8: Distribution of housekeeping staff by their monthly income levels

Monthly income	Frequency	Percentage
Less than 8000	7	8.8
More than 8000	73	91.2
Total	**80**	**100.0**

Source: Primary Data

Table 8 shows the distribution of housekeeping staff by their monthly income levels. The majority (91.3%) had an income of more than 8000, remaining had an income of less than 8000.

Inferential Statistics

I.   **H_0 Hypothesis:** There is no significant difference in the knowledge levels of housekeeping staff based on their demographic profile.
H_1 Hypothesis: There is a significant difference in the knowledge levels of housekeeping staff based on demographic profiles.

Table 9: Knowledge-based differences among various demographic groups of Housekeeping staff toward biomedical waste management

Particulars	Category	N	Mean	Std. Dev	Std. Err	f-value	p-value
Age	less than 25 years	10	20.40	1.430	0.452	29.058	0.000**
	25-35 years	43	21.44	2.313	0.353		
	35-45 years	19	26.21	2.820	0.647		

	more than 45	8	27.75	3.615	1.278		
Gender	Male	34	23.82	4.203	0.721	2.604	0.111
	Female	46	22.52	3.017	0.445		
Working department	OPD	17	20.18	1.912	0.464	12.379	0.000**
	ICU	16	24.69	2.960	0.740		
	OT	10	26.90	3.542	1.120		
	Wards	37	22.68	3.275	0.538		
Working hours	8 hours	51	21.39	2.631	0.368	49.555	0.000**
	More than 8 hours	29	26.03	3.168	0.588		
Experience	less than 2 years	8	20.13	1.246	0.441	22.571	0.000**
	2-5 years	36	21.17	2.287	0.381		
	5-10 years	28	25.04	3.085	0.583		
	more than 10 years	8	27.75	3.615	1.278		
Marital Status	Single	14	20.07	1.592	0.425	13.687	0.000**
	Married	66	23.71	3.594	0.442		
Monthly income	less than 8,000	7	20.00	1.291	0.488	5.937	0.017*
	more than 8,000	73	23.37	3.619	0.424		
	Total	80	23.08	3.603	0.403		

Calculated at 1% Significance level

Analysis of data furnished in Table 9 shows knowledge-based differences among various demographic groups of housekeeping staff. Among various age groups, the highest knowledge score of 27.75 is perceived by the age group of 'more than 45' and least score of 20.40 by the age group of 'less than 25'. With the mean and SD, the f-value is calculated. This difference is statistically significant.

Male housekeeping staff showed marginally better knowledge levels than female housekeeping staff. However, this difference is not statistically significant.

Staff with an experience of 10 years or more scored better than others. Staff posted in Operation Theatre scored highest and those posted in the outpatient department scored lowest. This difference is statistically significant. This can be attributed to the fact that experienced staff are posted in Operation theatre. Staff with better monthly income also have better knowledge levels. This also can be attributed to the fact that salary increases with an increase in experience which in turn influences knowledge.

Other than gender all the other demographic features influence the biomedical waste management knowledge levels. Hence the null hypothesis is rejected.

II.   **H$_0$ Hypothesis:** There is no significant difference in attitude levels of housekeeping staff based on their demographic profile.

H$_1$ Hypothesis: There is a significant difference in attitude levels of housekeeping staff based on demographic profiles.

Table 10: Attitude-based differences among various demographic groups of Housekeeping staff toward biomedical waste management

Particulars	Category	N	Mean	Std. Dev	Std. Err	f-value	p-value
Age	less than 25 years	10	22.00	1.563	0.494	18.858**	0.000
	25-35 years	43	24.56	2.979	0.454		
	35-45 years	19	27.84	3.321	0.762		
	more than 45	8	30.50	2.070	0.732		
Gender	Male	34	26.21	4.340	0.744	1.523	0.221
	Female	46	25.17	3.143	0.463		
Working department	OPD	17	22.53	2.718	0.659	10.955**	0.000
	ICU	16	27.25	3.454	0.864		
	OT	10	29.10	2.767	0.875		
	Wards	37	25.38	3.303	0.543		
Working hours	8 hours	51	24.29	3.233	0.453	22.641**	0.000
	More than 8 hours	29	27.93	3.3800	0.628		
Experience	less than 2 years	8	21.50	1.195	0.423	22.896**	0.000
	2-5 years	36	24.00	2.715	0.453		
	5-10 years	28	27.46	3.180	0.601		
	more than 10 years	8	30.50	2.070	0.732		
Marital Status	Single	14	21.64	2.098	0.561	25.450**	0.000
	Married	66	26.45	3.425	0.422		
Monthly income	less than 8,000	7	21.57	1.272	0.481	10.160**	0.002
	more than 8,000	73	26.00	3.636	0.426		
	Total	80	25.61	3.709	0.415		

Calculated at 1% Significance level

Analysis of data furnished in Table 10 shows attitude-based differences among various demographic groups of housekeeping staff.

Among various age groups, the highest attitude score of 30.50 is perceived by the age group of more than 45 and least score of 22.00 by the age group of less than 25. With the mean and SD, the f-value is calculated. This value indicates a significant association between age and attitude levels.

Male housekeeping staff showed marginally better attitude levels than female housekeeping staff. However, this difference is not statistically significant.

Staff with an experience of 10 years or more scored better than others. Staff posted in Operation Theatre scored highest and those posted in the outpatient department scored lowest. This difference is statistically significant. This can be attributed to the fact that experienced staff are posted in Operation theatre. Staff with better monthly income also have

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better attitude levels. This also can be attributed to the fact that salary increases with an increase in experience which in turn influences knowledge and attitude.

Other than gender all the other demographic features influence the biomedical waste management attitude levels. Hence the null hypothesis is rejected.

III. **H$_0$ Hypothesis:** There is no significant difference in practice levels of housekeeping staff based on their demographic profile.

H$_1$ Hypothesis: There is a significant difference in practice levels of housekeeping staff based on demographic profile.

Table 11: Practice-based differences among various demographic groups of housekeeping staff toward biomedical waste management

Particulars	Category	N	Mean	Std. Dev	Std. Err	f-value	p-value
Age	less than 25 years	10	19.50	2.550	0.806	9.441**	0.000
	25-35 years	43	21.67	3.414	0.521		
	35-45 years	19	25.00	2.055	0.471		
	more than 45	8	24.75	4.200	1.485		
Gender	Male	34	23.03	4.064	0.697	1.281	0.261
	Female	46	22.11	3.213	0.474		
Working department	OPD	17	19.94	3.092	0.750	7.375**	0.000
	ICU	16	24.56	2.632	0.658		
	OT	10	24.70	3.529	1.116		
	Wards	37	22.19	3.439	0.565		
Working hours	8 hours	51	21.29	3.372	0.472	19.427**	0.000
	More than8 hours	29	24.62	3.005	0.558		
Experience	less than 2 years	8	19.63	2.925	1.034	12.236**	0.000
	2-5 years	36	20.92	3.055	0.509		
	5-10 years	28	24.71	2.594	0.490		
	more than 10 years	8	24.75	4.200	1.485		
Marital Status	Single	14	18.36	2.468	0.660	30.919**	0.000
	Married	66	23.38	3.176	0.391		
Monthly income	less than 8,000	7	20.00	2.944	1.113	3.824*	0.054
	more than 8,000	73	22.74	3.586	0.420		
	Total	80	22.50	3.604	0.403		

Calculated at 1% Significance level

Analysis of data furnished in Table 11 shows practice-based differences among various demographic groups of housekeeping staff.

Among various age groups, the highest mean score of 25.00 is perceived by the age group of 35-45 and least score of 19.50 by the age group of less than 25. With the mean and SD, the f-value is calculated. This value indicates a significant association between age and practice levels.

Male housekeeping staff showed marginally better practice levels than female housekeeping staff. However, this difference is not statistically significant.

Staff with an experience of 10 years or more scored better than others. Staff posted in Operation Theatre scored highest and those posted in the outpatient department scored lowest. This difference is statistically significant. This can be attributed to the fact that experienced staff are posted in Operation theatre. Staff with better monthly income also have better practice levels. This also can be attributed to the fact that salary increases with an increase in experience and this experience, in turn, influences knowledge and attitude, and practice.

Other than gender all the other demographic features influence the biomedical waste management practice levels. Hence the null hypothesis is rejected.

FINDINGS

The present study was an attempt to understand the knowledge, attitude, and practices of biomedical waste management among the housekeeping staff of a corporate hospital in Hyderabad. The major findings arrived at from the findings are given below

1) There is a significant difference in knowledge levels among different groups of age, working department, working hours, years of experience, and marital status. Though male housekeeping staff exhibited better knowledge scores than female housekeeping staff, this difference is not statistically significant.

2) There is a significant difference in attitude levels among different groups of age, working department, working hours, years of experience, and marital status. Though male housekeeping staff exhibited better attitudes than female housekeeping staff, this difference is not statistically significant.

3) There is a significant difference in practice levels among different groups of age, working department, working hours, years of experience, and marital status. Though male housekeeping staff exhibited better practices than female housekeeping staff, this difference is not statistically significant.

4) Out of the 80 housekeeping staff, 21.2% had high knowledge scores, 71.3% had a medium level of knowledge scores and 7.5% had low knowledge scores. They had less clarity on the segregation aspect.

5) 27.5% of the housekeeping staff had a high level of attitude scores, 56.3% had a medium level of attitude scores and 16.2 % had low attitude scores. The majority of the respondents considered biomedical waste management as an additional burden on their work.

6) 25% of the housekeeping staff had a high level of practice scores, 58.7% had a medium level of practice scores and 16.3% had a low level of practice scores. The majority of the staff did not use Personal protective equipment during biomedical waste collection and transportation.

LIMITATIONS
This study has the following limitations
- Name of the hospital is not mentioned as it is confidential.
- Housekeeping staff of only one hospital are included in the study.

CONCLUSION
This study concludes that the majority of the housekeeping staff have average levels of knowledge, attitude, and practice scores. This can be attributed to the lack of awareness and low level of education. Regular training programs can help in filling this gap. Every member involved in biomedical waste management should be aware of its hazards and should actively participate to minimize these hazards and make the environment cleaner and safer.

Healthcare waste can be hazardous if not handled properly. The focus should be on reducing, reusing, and recycling the waste.

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