Knowledge, Attitude And Practices Of Bio-Medical Waste Management Amongst Staff Of Institutional Trauma Center Level II

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Abstract:

Background—Despite the statutory provision of Biomedical Waste Management, bio waste management practices in Indian Hospitals have not achieved the desired outcomes. The present study on Knowledge, Attitude and Practice (KAP) on the subject was carried out in the institutional trauma center of a medical teaching institute in Northern India.

Method and Materials—The hospital under scrutiny for KAP is a 290 bedded trauma center. The study is based on a questionnaire designed to understand the KAP of these staff involved in direct patient care. The KAP study enrolled 256 respondents, representing doctors, residents, nurses and paramedicals from patient care areas.

Observations and Results—A significant gap was observed in the knowledge, attitude and practice of the consultants, residents, nurses and paramedicals in regard to biomedical waste disposal.

Conclusions—The definite apathy of intellectuals towards the operational aspects of the BMW management can be attributed to the tubular vision of the professionals that is mainly focused on the treatment aspects of the patient. Residents showed very low KAP of BMW, may be because of their preoccupation in another aspect of patient care. Nursing professionals on the other hand, had an edge over the clinicians as far as attitude and practice of BMW management is concerned. This can be attributed to their accountability in ward management. The para-medical staff had less understanding on the subject, but had a relatively less positive attitude. Their attitude was lesser rigid than other worker, which may be attributed to fear for any punitive action.

Keywords:
Biomedical waste; Knowledge, Attitude and Practices; Trauma Center; Biomedical Waste Management; KAP of Biowaste management.

Introduction:
The problem of waste management has arisen recently in developing countries where there is little history of the implementation of formal and informal community environmental education, awareness program. [1] The data from developing countries indicate that the biomedical waste (BMW) production ranges from 1-2 kg per day per bed. [2]

Environmental attitude of young people appears to be crucial as they ultimately play a direct role in providing knowledge based solutions to these problems. Begum et al. [3] found that the majority of the doctors, nurses, and housekeepers have unsatisfactory knowledge and inadequate practice related to health care waste management.

The Objectives and rationale of BMW management are mainly to reduce waste generation, efficient collection, handling and disposal in such a way that it controls infection and provides safety for employees working in the system. [4] This study was therefore, conducted to understand the Knowledge, Attitude and Practices amongst the employees of trauma center in a teaching institution as regards to BMW management practices.

Method and Material:

This study was conducted in 290 bedded trauma center of C. S. M. Medical University, Lucknow. About 75% of all patients attending it, are direct (non-referred patients). There is an administrative team headed by Trauma Center Incharge, is assisted by one co-faculty incharge and two assistant faculty incharge. Trauma center has one clinical wing and other diagnostic wing. There is a 17 bedded casualty room, where all emergencies and patients lend first. After the primary treatment and stabilisation of the condition, patients are sent to the respective units for definitive
management. The trauma center has 05 units, which are orthopaedics (47 bedded), surgery (77 bedded), neurosurgery (25 bedded), general medicine (32 bedded) and paediatrics (30 bedded). Beside these, it has 22 bedded traumatic ventilator unit (TVU) and 24 bedded exclusive disaster ward. There are 04 major operation theaters, two minor rooms and one plaster room.

There is no exclusive independent staff, including doctors, residents, nurses and paramedics meant for the trauma center. So every day, there is a change in the ‘on call’ team of doctors and residents in these units and that of anesthetists on call team. Trauma center has a definite, very acute and serious shortage of nursing and paramedical staff. The majority of class IV staff is provided by contracting agency. So there is a very fast change of faces occurs in the trauma center. Sisters incharge of various wards and operation theaters are basically responsible for the sanitation and biowaste management. To assist them and supervise these activities, we have one sanitary inspector. The university BMW team took a regular round of the trauma centers and they took regular training programs of these staffers.

The present KAP study enrolled 256 respondents, representing doctors, residents, nurses and paramedics from patient care areas of trauma center. The staff includes consultants, Residents, Nurses, O.T. Staff, Sanitary staff and Laboratory staff and was grouped as Group I to Group VI accordingly. Total 500 structured validated questionnaires, were distributed. We relieved 256 feedbacks out of these 500. Out of these 256 respondents, there were only 28 consultants (10.9%), 33 residents (12.9%), 28 nurses (10.9%), 14 OT staff (5.5%), 10 laboratory staff (3.9%) and 143 sanitary staff (55.9%). The responses on attitude were classified into less favorable, favorable and most favorable. Those who had good practices were assumed to be managing the waste in the proper manner and be able protect themselves and environment from the negative impact of waste.

Before it was used, the questionnaire was pretested in the pilot study. Split half method was used to calculate the reliability. Reliability of the questionnaire was .96, .94 and .96 for knowledge, attitude and practices questionnaire respectively. Information collected through questionnaire included (1) General information on respondents, including age, education, family type and size etc. (2) knowledge regarding waste management (3) attitude regarding waste management (4) practices regarding waste management.

The respondents were well informed about the purpose of the study and about the questionnaire by the research investigator prior to data collection. After collecting data, data were edited and tabulated before data analysis. Descriptive statistics, i.e. percentage, mean and standard deviation was used to describe studied variables. ‘t’ test and correlation tests were used according to the objective of this study.

**Table 1:**Positive answers of questionnaire by staff of different groups
Results and Discussion:
The results of questionnaire analysis show that about 85% and 81% amongst the consultant and resident respondents, respectively, have relevant knowledge of BMW management. Out of these there were 12 consultants of medical departments and rest 16 were of surgical side. Though all the consultants were having the relevant knowledge, but they were having varying attitude and practices. There was a significant difference amongst them, as far as attitude and practices of BMW were concerned. The details of these data have been shown in Table- 2. This shows that the people with higher education have more awareness about the environmental issues, national and international activities in Biomedical waste management and the rules prescribed there in; significantly the professional status and higher education were not having a direct positive impact on their attitudes towards the facts and thus their practices were also not corresponding.

Table 2: Showing KAP amongst positive respondent consultants and residents

<table>
<thead>
<tr>
<th>Group</th>
<th>Consultants (n=28)</th>
<th>Residents (n=33)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Medical Faculty</td>
<td>Surgical Faculty</td>
</tr>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>Knowledge</td>
<td>12</td>
<td>100</td>
</tr>
<tr>
<td>Attitude</td>
<td>12</td>
<td>100</td>
</tr>
<tr>
<td>Practice</td>
<td>04</td>
<td>33.3</td>
</tr>
</tbody>
</table>

The nursing staff is the backbone of the patient management. Though the trauma center has been a high pressure area of patient care, there is a significant and acute shortage of nursing staff in the trauma center. The other significant fact regarding nursing staff is concerned that as there is no independent staff marked for trauma center, so whatever nurses in ward are there, many of them are temporary with not much and appropriate training. There is a very serious complaint that these nurses are being very frequently transferred from their place of work. This fact is directly relevant and significant as this may directly affect the training of these nurses about BMW management. Despite of these facts, there was very
significant high knowledge and attitude of BMW management amongst the nursing staff of the trauma center. There were significantly low practices of biowaste management.

Operation theaters where one of the most pressure areas of biomedical waste was concerned. The biowaste management in this area may be directly having an impact on theater and patient management. The results showed that the knowledge of the subject and attitude towards the facts were significantly higher amongst the operation theater staff. Though only 71.4% of them were practicing the ‘do and do not’ of BMW management, but their higher attitude was much more significant.

**Table 3:** Showing grades of KAP amongst the positive respondents

<table>
<thead>
<tr>
<th>S.No</th>
<th>Variables</th>
<th>Category</th>
<th>Numbers</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Knowledge (n=201)</td>
<td>Low</td>
<td>52</td>
<td>25.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Medium</td>
<td>64</td>
<td>31.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>High</td>
<td>85</td>
<td>42.3</td>
</tr>
<tr>
<td>2</td>
<td>Attitude (n=211)</td>
<td>Less Favourable</td>
<td>101</td>
<td>47.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Favourable</td>
<td>42</td>
<td>19.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Most Favourable</td>
<td>68</td>
<td>32.3</td>
</tr>
<tr>
<td>3</td>
<td>Practices (n=115)</td>
<td>Poor</td>
<td>60</td>
<td>52.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Moderate</td>
<td>20</td>
<td>17.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Good</td>
<td>35</td>
<td>30.4</td>
</tr>
</tbody>
</table>

The results showed that there was a poor knowledge of the matter amongst them, but their relative attitude was higher and significant. As of other groups, the practices were not being followed amongst them, with an attitude these may be modified.

The comparison of Knowledge, with an Attitude and Practice of groups shows that the people with higher education, as consultants, Residents and Scientists though have very good knowledge but a relatively low percentage of people having the same kind of attitude and practice habits. At the same time if we compare the nurses or Operation Theatre staff, we find that they too have a good percentage of people with good knowledge, almost similar in all the three groups I and II and therefore, attitude and practice percentage is also very high. It has been mainly attributed to the instruction manual and the responsibility given to the nursing staff for implementation of rules by the authorities.

The sanitary staff of a trauma center is contractual and made available by a service agency. This fact leads to higher turnover of these workers. So the training of these staffers may not be off the mark.
staff, though has very poor knowledge about the BMW Act and rules, but a good percentage of this category has a positive attitude and practice habits. The laboratory staff was found to have recorded lowest in all the three aspects. This indicates that neither authority informed them in the form of instructions nor they supervised their Biomedical waste management practices.

Hebel-Ulrich et al.[5] (2005) has found that many responses regarding knowledge indicate that the awareness about hygiene exists, but is not being practiced. Also the observation of several risk behaviors, such as open defecation, lack of personal hygiene and irresponsible waste management suggests the need for hygiene educational program. According to Ehrampoush et.al.[1] (2005) the knowledge of the students regarding waste management was not appropriate. About 66% of students did not participate in segregation and recycling of solid waste. Pancake et.al. [6] (2006) observed that the majority of Asian students appeared to have lack of environmental consciousness and attitude needed to protect their environment. Therefore, it is important to develop skills, awareness, and attitude and put into practice. As per the study done by Saini et al.[2] (2005) measured the attitude regarding biomedical waste management of doctors, nurses, and other support staff. They found that the people with higher education and knowledge have better attitude towards the subject. Grodzinska et al.[7] (2002) also found that a correlation between the level of students’ knowledge and their activities was found regarding waste management. Wai ae et al.[8] (2005) that there was a significant association between knowledge and practices with a correlation coefficient of 0.39 and knowledge and attitude with a correlation coefficient of 0.289. But there was no significant association between attitude and practices for environmental sanitation. Lalita et al.[9] (2011) in her study concluded that The majority of the respondents have unsatisfactory knowledge attitude and inadequate practices related to waste management. This study has shown a need to improve the knowledge about waste management to protect the environment from the negative impact of waste. It is recommended to implement the need based training program for students at their school hostels and work places. Suchitra et al.[10] (2007) concluded in her study that education has a positive impact on retention of knowledge, attitudes and practices in all categories of staff. There is a need to develop a system of continuous education for all categories of staff. Hesse et al.[11] (2006) also concluded that good knowledge, attitude and practices are important to prevent HIV infection spread.Saini et al.[2] (2005) in her study observed a significant gap in the knowledge, attitude

<table>
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<th>Table 4: Showing demographic characteristics of the study</th>
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<tbody>
<tr>
<td>Consultants</td>
</tr>
<tr>
<td>Age (Av in Years)</td>
</tr>
<tr>
<td>Sex</td>
</tr>
<tr>
<td>Male</td>
</tr>
<tr>
<td>Female</td>
</tr>
<tr>
<td>Type of Job</td>
</tr>
<tr>
<td>Permanent</td>
</tr>
<tr>
<td>Temporary</td>
</tr>
<tr>
<td>Formally Trained</td>
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Sanitary
and practice of the consultants, residents and scientists with regard to biomedical waste disposal, to their
knowledge/understanding on the subject.

Conclusion:
This study showed that knowledge, attitude and practices have no correlation with each other. The definite callus
attitude of intellectuals towards the operational aspects of the BMW management system can be attributed to the
microscopic vision of these professionals that is mainly focused on the curative aspects of the patient care services,
with probable failure to understanding the role of support services in the overall context of comprehensive health care
delivery. Nursing professionals on the other hand, had an upper hand over the clinicians as far as attitude and practice
of BMW management is concerned, although their depth of knowledge on the subject was relatively low. This can be
attributed to their accountability and commitment in ward management and the predominance of female workforce,
which is by and large more disciplined. The para-medical staff, including laboratory and housekeeping staff had less
understanding on the subject, but had a higher positive attitude with more practical habits, which may be attributed to
strict instructions by authorities and fear for any punitive action.

Key Messages:

- Medical professionals have tubular vision regarding patient care, and lack attitude to this statutory provision
- Nurses have better understanding and are more responsible in the implementation
- Paramedical staff has less understanding, but better practical application of various aspects
- Motivation and change of mindset in key functionaries like a doctor is essential for successful implementation
  of the BMW management program.

Some suggestions which would act as remedial measures include:

- Intensive training programs at regular time interval for all the staff with special importance to the new comers.
- Need for orientation programs for newcomers to understand the hospital function.
- The entire waste management practices should be a part of total hygiene practice of the society rather than
  confining to hospital and health facility.

Limitations:
This study has limitations, but is also a good starting point for more extensive future research with the aim of giving
our patients optimal care whilst being careful not to compromise our own health in the process.

1. The sampled population is small making it difficult to generalize the findings
2. A few of the respondents are medical students (sub-interns) with limited clinical experience
3. Respondents did not answer every question which limited comparisons of responses
4. There is limited literature available on previous studies involving doctors and nurses in similar developing
countries.

References:
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