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Research Article

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Perception and practice regarding infection control measures among healthcare workers in a tertiary center, South India

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ABSTRACT

Infection control is the discipline concerned with preventing nosocomial or healthcare-associated infection, a practical (rather than academic) sub-discipline of epidemiology. It is an essential, though often under recognized and under supported, part of the infrastructure of health care. Hence the objective of the present study was to assess perception & practice of infection control measures among healthcare workers in district government hospital of Tumkur. A cross sectional study was conducted among hospital employees using a pretested questionnaire which had four domains. 78.5% of health care workers had knowledge about sterilization procedures for infection control and regarding the sterilization procedures used. When observed for practice had many lacunaes. Knowledge towards infection control procedures was goo but attitude as well as practice was very poor indicating the need for motivation & training.

Key words: Infection control, Health care workers, Hospital acquired infections.

INTRODUCTION

Healthcare-associated infections (HCAI) are a major setback to any organization. The prevalence of HCAI varies widely across the globe. Worldwide it is estimated that almost 10% of the hospitalized patients acquire at least one HCAI. [1,2] The prevalence of HCAI in developing countries can become as high as 30-50%. [3,4] Many of these pathogens in HCAI are multi-drug resistant and are able to survive in the environment for a long period of time. [5,6] The most important mechanism of spread of these HCAI is via the contaminated hands of the healthcare givers that is doctors, nurses, other staff or relatives/friends of the patients. Contaminated environmental surfaces are another important reservoir for spread of these infections. [5,6] However, they are often un-recognized. Infection can also spread to patients by drugs, intravenous solutions or by foodstuffs. [5,6] These HCAI are associated with increased morbidity, mortality and healthcare expenditures. Due to these clinical, ethical and financial factors, healthcare providers are increasingly paying more attention to surveillance and prevention of HCAI. [7]

Hence, healthcare workers must know the various measures for their own protection. They should improve organization of work, implement standard precautions and dispose biomedical waste properly to prevent occupational exposure. Cross infection makes infection control practices important for health care personal's to protect both patient as well as themselves. Effective implementation of infection control procedures and adherence to standard precautions are challenging especially in resource-limited settings.

So, the purpose of the present study is to know the perception & practice regarding infection control measures among health care workers of district hospital, Tumkur city.

EXPERIMENTAL SECTION

Design: A cross sectional study was conducted among hospital employees in district referral hospital, Tumkur city who had direct contact with patients or their immediate environment in the month of September 2013.

Subjects: Study participants were nursing/ technical professionals and interns.

Questionnaire: An anonymous, structured, self- administered questionnaire printed in local language (Kannada) was pre tested and kappa statistics (0.80) was used for internal & external validity. The questionnaire was divided into four domains:

1) Knowledge about standard infection control procedures.
2) Attitude towards the utility of guidelines/protocols compliance of infection control.
3) Perception of Environmental cleaning & about their training in Infection control procedures.
4) Practice of various ways to prevent the hospital acquired infections.

Apart from demographic variables, the experience in direct patient care (in years) was recorded.

The first domain of the proforma judged the knowledge of health care workers on the correct method of instrument sterilization, use of protective barriers while handling patients and in various procedures, appropriate hand washing, disposal of used syringes and needles, their recapping after use & disposal of biomedical waste.

The second domain of the proforma judged the attitude of healthcare workers in the incident of a needle-stick injury, about hepatitis B immunization, and necessity of the awareness about various infection-control measures.

The third domain of the proforma had questions to assess the perception of various activities that prevent HAIs and the satisfaction about their training regarding that. It also had questions on accidental exposure to infected blood samples, provision in hospitals for reporting this, the support offered by the hospital for training programmes and any working infection control committee in the hospital. The last part was filled by investigator after observing the work of health care workers in wards/labs.

Data collection and analysis:
The permission to conduct the study was taken from the District surgeon & medical superident of the govt, hospital. Ethical clearance was obtained by institutional ethical review board. The participants were approached in the hospitals. After obtaining the written informed consent, data was collected by a self-administered questionnaire for assessing the perception whereas practices of nurses and technicians with respect to infection control were observed. The questionnaires were distributed and adequate time was given to complete and return. The nursing and other technical staffs working in three different shifts per day were included by contacting at their scheduled timings to include all the health care workers of the hospital. Observations were recorded on a pre-tested semi-structured proforma.

The collected data was entered and analyzed using Statistical Package for Social Sciences (SPSS) Version 11.5, and Chi-square test and *p* value of 0.05 was used to see association.

RESULTS

Of the total 186 hospital staff, 128 (84 hospital staff including nurses and technicians and 44 nursing students) participated in the present study.

Demographic variables:
Table 1 shows that majority of participants (66.4%) were in the age group of 20 -30 years. All the nurses had completed either BSc (Nursing) or Diploma, the technicians had done BSc in Medical Laboratory Technology (MLT) & the nursing students were from IInd and IIIrd year of BSc Nursing posted in government hospital for their clinical training. Majority of the participants were females 62.5% (100% of the nurses being females) & the remaining 37.5% were male staff and technicians. 63% were less than 5 years of experience, 14% were between 5-10 years, 16% were between 10 - 15 years & 6% were above 15years.

Table 2 describes majority of health care workers (78.5%) had knowledge about sterilization procedures for infection control and regarding the sterilization procedures used.

Table 1: Demographic details

CHARACTERISTICS	N (%)
Gender distribution	
Males	37.5%
Females	62.5%
Distribution of Participants	
Nurses	53.9%
Technicians	11.7%
Interns	34.4%
Age groups (In years)	
21-30	66.4%
31-40	27.3%
41-50	6.2%
Educational qualification	
BSc/ Diploma/ GNB	53.9%
MBBS - Interns	34.4%
MLT	11.7%
Level of experience	
< than 5 years	63%
5– 10 years	14%
10– 15 years	16%
> Than 15 years	06%

Table 2: Knowledge of HCWS on Infection control procedures:

	Hospital Staff	Students
Sterilizer used	**Response in Percentage**	
Autoclave	63.1	34.1
Boiling	36.9	65.9
χ^2 Value – 9.755 p-value - 0.002		
Immediate action taken when in direct contact with HIV patients		
Anti HIV immunoglobulins	**22.6**	**20.5**
Anti HIV drugs	**48.8**	**25.0**
Blood test	**21.4**	**38.6**
Dont know	**7.1**	**15.9**
χ^2 Value – 9.403 p-value – 0.24		
Personnel protective measures used		
Gloves, Mouth mask, Apron	**77.4**	**80.5**
Gloves, Mouth mask	**13.1**	**10.9**
Gloves	**9.5**	**8.6**
Protective eye ware	**0**	**0**
χ^2 Value – 1.576 , p-value – 0.45		

Table 3: Comparison of Knowledge of HCWs on Infection control procedures

	Hospital Staff	Students
Sterilizer used	**Response in Percentage**	
Autoclave	63.1	34.1 **S**
Boiling	36.9	65.9
χ^2 Value – 9.755 p-value - 0.002		
Immediate action taken when in direct contact with HIV patients		
Anti HIV immunoglobulins	22.6	20.5
Anti HIV drugs	48.8	25.0 **NS**
Blood test	21.4	38.6
Dont know	7.1	15.9
χ^2 Value – 9.403 p-value – 0.24		
Personnel protective measures used		
Gloves, Mouth mask, Apron	77.4	80.5 **NS**
Gloves, Mouth mask	13.1	10.9
Gloves	9.5	8.6
Protective eye ware	0	0
χ^2 Value – 1.576 , p-value – 0.45		

***S** – Significant: **NS** – Not Significant.*

Table 3 depicts the comparison in knowledge about sterilization procedures among hospital staff & students. 63% of the Hospital workers said Autoclave compared to students & this difference was statistically significant.

80.5% of participants had answered that they use Gloves, Mouth mask & Apron as personal protective measures but none reported for the use of protective eye glasses. 89.1% were aware of hepatitis B vaccination & vaccinated as well, and almost half (58.3%) of the healthcare workers (54.2% hospital staff and 64% students) were aware of the

six steps of hand washing and all of them reported using plain soap for maintaining hand hygiene. 61.7% reported that they dispose the gloves after its usage, but 31.3% still reported of its reuse.

93% of the health care workers had a attitude that they follow all the safety rules at work and 86.7% reported to use PPE to prevent cross infections & believe that it won't interfere their work.

Table 4 shows when the compliance for infection control procedures was checked with their year of experience, it was noted that as the number of years of experience increases the use of PPE decreases. And this was statistically significant.

On being asked about the procedure to be followed in the event of a needle-stick injury, 85.3% healthcare workers were aware of the appropriate sequence of events to be followed and its notification to the appropriate authority immediately. Some (16.4%) healthcare workers were already exposed to infectious blood samples but awareness regarding the Infection Control Committee in the hospital was very poor as only 12.3% were aware of the presence of such a committee. Among the hospital staff, 70% have not undergone any training program for infection control, this included 88.6% hospital staff and 88% students. 65.6% were not aware of biomedical waste management handling rules & reported municipal dustbin may be method employed to dispose the hospital waste. Nearly half of the staff reported lagging encouragement from the higher authority for training programmes & 48.4% somewhat disagreed that there will be a necessary support from the hospital authority to protect themselves in case of accidental exposure/injuries.

Observations with respect to infection-control practices of healthcare workers:
The observation was carried out among the hospital staff only as nursing students were not engaged in routine care and procedures in the ward. On observing the work of hospital staff (n = 84), it was observed that 62.3% respondents disposed the used syringes and needles in the correct way and 38.7% still recap the needles after use; 72% hospital staff washed their hands after every patient & only 28% threw the infected waste in a red/yellow bag. Segregation at the point of disposal was not done & the people who use to clean/carry the waste didn't follow any of the protective measures.

Table 4: Comparison of compliance to infection control procedures in different age groups

Wear disposable gloves whenever there is a possibility of exposure to blood or other body fluids	**Less than 70% of the time**	**More than 70% of the time**
< than 5 years	28.4	71.6
5– 10 years	66.7	33.3 **HS**
10– 15 years	57.1	42.9
> Than 15 years	75.0	25.0
χ^2 Value – 16.251, p-value – 0.001		
Wear a mask when there is potential exposure to an airborne respiratory communicable disease		
< than 5 years	33.3	66.7
5– 10 years	27.8	72.2 **S**
10– 15 years	52.4	47.6
> Than 15 years	50.0	50.0
χ^2 Value – 9.715 , p-value – 0.021		
Wear protective eyewear whenever there is a possibility of splashes of blood or other bodily fluids		
< than 5 years	98.8	1.2
5– 10 years	94.4	5.6
10– 15 years	85.7	14.3 **S**
> Than 15 years	100	0
χ^2 Value – 8.023 , p-value – 0.046		

***S** – Significant: **NS** – Not Significant: **HS** – Highly Significant.*

DISCUSSION

Considering the enormity of the challenge that infectious agents pose as well as their nature to continuously multiply in real time, the implementation of effective sterilization protocol among all healthcare communities is vital. The data from this study indicated that the current state of knowledge related to sterilization among health care workers was good but attitude towards practice & practice was poor. This was similar to the survey of Sessa et al on nurses of Italy where the attitude on Hospital Acquired Infections was not satisfactory making them to not to perform appropriately the disinfection in their work activity. [8]

Askarian et al state that their study showed a generally poor adherence to standard isolation precautions among dental health care professionals in Shiraz. [9] The literature knowledge emphasize that only having knowledge of infection control measures and a positive attitude towards them does not ensure adherence to the guidelines.

[10,11,12] This is similar to present study results. And present study found that although knowledge towards sterilizing is high, practice is not coherent with the literature knowledge. This was similar to a survey of hospital employees conducted in Kampala, Uganda. [13] The difference obtained regarding knowledge, attitude and practice of cleaning & sterilization of the instruments was statistically significant similar to a study by Y Jain A et al. [14] Hence, the findings of the present study marked the importance of training the healthcare workers and maintaining strict protocol regarding infection control procedures in the hospitals.

Along with that one should abide themselves to the universal guidelines like "Standard infection control and precautions", "OSHA regulations" and guidelines set by Center for Disease Control & Prevention. [12,15-19]

Suggested measures to overcome this problem:
Hospital Acquired Infection is a health hazard. It is important to minimize the risk of spread of infection to patients and staff in hospital. Training in infection control programme along with a formation of Infection Control Committee (ICC) in the hospital to help health care workers to report & get timely support should be encouraged. This helps in reducing patients' morbidity, mortality, length & cost associated with hospital stay & a sense of security for the health care workers.

CONCLUSION

Overall knowledge towards infection control procedures was good among the health care workers of a government district hospital, Tumkur. But, attitude as well as practice was very poor. To address these shortfalls and to improve the adherence to procedures constant motivation is required. Improved compliance with recommended infection control measures is required for all health care personnel's.

Continuing education programs and short-time training courses about cross infection and infection control procedures are suitable for students, assistants to upgrade as well as to reinforce the practices. Many lacunae's exist in educating, monitoring and upgrading the employs. Measures have to be taken to motivate the seniors to organize & encourage continuous education as well as training programmes.

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