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Original Research Article

Knowledge, attitude and practice of infection control methods among health care workers

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ABSTRACT

Background: Disposal of biomedical waste is neglected issue even in the urban heath care settings. So chances of transmission of infection increase which leads to high morbidity and mortality. Spread of disease can also be controlled by establishing isolation ward and it can be monitored through Hospital Infection Control Committee.
Methods: This is a cross sectional study conducted in urban and rural health care settings of Ahmedabad district to assess the knowledge, attitude and practice of health care workers. In the present study 300 HCWs including Doctors, Nurses, Technicians and Servants were interviewed. Pre-tested questionnaire was used to collect the data regarding knowledge of infection control methods and various waste disposal practices.
Results: Only 51% of health care workers were aware about the Isolation ward and 60% of HCWs were aware about hospital infection control committee. 87% nurses were correctly disposing gloves in urban health care settings. All the HCWs were using disposable syringe. Even in urban settings also 33% of doctors and 20% of nurses were recapping needle after using it.
Conclusions: Constant reinforcement of knowledge should be done and regular training should be given to change the behavior regarding biomedical waste disposal.

Keywords: Bio-medical waste disposal, Urban heath care setting, Rural health care setting

INTRODUCTION

Healthcare workers (HCWs) are defined as all persons, paid and unpaid, working in ambulatory care settings who have the potential for exposure to patients and/or to infectious materials, including body substances, contaminated medical supplies and equipment, contaminated environmental surfaces, or contaminated air.[1]

Universal precautions (UPs) is utmost important in terms of infection prevention to patients and to HCWs also so it should be followed without fail for each and every procedure. It should be used considering every source as infectious and regardless of patient's diagnosis. Compliance to UPs will protect HCWs by reducing the risk of infection.[2,3]

No epidemiological evidence suggests that traditional waste-disposal practices of health-care facilities have caused disease in either the health-care setting or the general community.[4] The most practical approach to medical waste management is to identify wastes that represent a sufficient potential risk of causing infection during handling and disposal; and for which some precautions likely are prudent.[5]

Biomedical waste should be carefully disposed and segregated in various colour coded bags according to guideline before it is collected and sent for final

treatment.[6] To combat hospital infection, it is essential that the hospital according to its available resources and requirement, establishes a Hospital Infection Control Committee.[7] Along with specialists from various departments who serve as members, representative from nursing and housekeeping staff should also be involved. Hospital infection control committee with the help of surveillance staff ensures smooth surveillance and control of hospital infection. For highly infectious disease like diphtheria, swine flu there should be an isolation ward which curbs the spread of infection. Knowledge of isolation ward among HCWs makes them more concern with various infections.

Now a day in most of the health care settings disposable syringe is used but handling of needle requires reinforcement through training. Apart from doctors and nurses, technicians and servants are also at the risk of getting accidental exposure to infectious sources. In India, many studies have been conducted for assessing knowledge and practice of doctors and nurses. So this study was conducted to assess knowledge, attitude and practice of infection control methods even among technicians and servants along with doctors and nurses where ever it is applicable.

METHODS

Ahmedabad district is seventh in India and first in Gujarat in terms of population with the population of 72,08,200 (census 2011). Ahmedabad civil hospital is the biggest hospital of Asia. It has various specialty and super specialty departments and has high drains of patients from all over Gujarat and from nearby states like Rajasthan, Madhya Pradesh. In the study; knowledge, attitude and practice of universal precautions, waste disposal, sterilization methods and post exposure prophylaxis among heath care workers including Doctors, Nurses, Technicians and Servants were assessed in urban and rural Health care setting of Ahmedabad district. As it is not possible to mention all the data in one article so in present article assessment for waste disposal and other infection control methods is mentioned. Other aspects have been mentioned in separate article. Expecting the prevalence of correct knowledge regarding universal precautions to be 50%, alpha 5% and chance error ±10%, the sample size worked out to be 96.[8] There for 100 Health Care Workers from Rural and 200 HCWs from Urban area were taken in the study. In urban area sample was increased as it increases validity of the study and it is feasible to involve more participants in urban settings.

For urban setting civil hospital and for rural setting CHCs and PHCs of Ahmedabad district were included in the study. This was carried out from June 2011 to January 2012.

In the hospital there are total 27 units including specialty and super specialty. So out of those 12 main units were selected which included medicine, surgery, orthopedics, obstetrics and gynecology, paediatric, pathology, ophthalmology, radiology, ICU, paediatric ICU, emergency and labour room. Out of these departments 63 doctors, 87 nurses, 16 technicians and 34 servants were selected randomly for the study.

There are total 13 CHCs and 36 PHCs in Ahmedabad district; out of which 9 health care settings were selected through simple random technique which included 4 CHCs and 5 PHCs. From these rural settings total 29 doctors, 31 nurses, 11 technicians and 29 servants were selected randomly.

Predesigned and pretested questionnaire was used for the data collection. Prior permission was taken from the respected authority for the data collection. The proforma was in English so in case of doctors, nurses and technicians data was filled by themselves but for servants, questions were asked in Gujarati and data was filled by investigator.

Data entry was done in excel 2007 and analyzed in Epi-info software version 7. Statistical tests like Percentage, chi-square test were used for the analysis.

RESULTS

Almost all the HCW knew the importance of mask requirement during splash in both urban and rural settings. Knowledge of eye protection was almost same in doctors 60 (95.24%) and nurses 82 (94.25%) while it was 100% in technicians in urban area. All the nurses (29) and the technicians (11) in rural area knew the importance of self-protection regardless of patient's diagnosis. As servants are not involved in diagnostic procedure they are not assessed for knowledge regarding routing testing done in patients undergoing surgery. Except for the knowledge of mask, the difference between urban and rural settings was not significant for other conditions (Table 1).

Isolation ward plays a good role in keeping the infectious diseases to limited area; even though knowledge about it was much less among HCWs of rural area and the difference was significant. The number of HCWs who were not even aware about Infection Control Committee was notably low and among the rest most of HCWs (48%) of rural settings did not know that it was present in their hospital and the difference between urban and rural settings was significant (Table 2).

Regarding waste disposal, correct practice was observed more in urban settings compare to rural area for all type of waste even though in urban areas also it was not satisfactory high. Food items and Sputum were correctly disposed by 71 (81.61%), 66 (75.86%) nurses respectively in urban area. In rural area all the nurses 31 (100%) were disposing human organ correctly. For room wastage correct practice was seen more in servants both in urban and rural settings 28 (82.35%), 10 (34.48%) respectively. Difference between urban and rural setting was statistically significant for all the waste disposal practice (Table 3).

Table 1: Knowledge of infection control.

		Respondents				
		Doctor (%)	Nurse (%)	Technician (%)	Servant (%)	χ^2
Mask required against splash	Urban	63 (100)	87 (100)	16 (100)	30 (88.3)	χ^2 =13.1, p<0.01
	Rural	27 (93.10)	31 (100)	11 (100)	18 (62.07)	
Eye protection required against splash	Urban	60 (95.24)	82 (94.25)	16 (100)	25 (73.53)	χ^2 = 9.4, p>0.01
	Rural	27 (93.10)	25 (80.65)	9 (81.82)	18 (62.07)	
Protection regardless of Patient's diagnosis	Urban	62 (98.41)	79 (90.80)	3 (18.75)	26 (76.47)	χ^2 = 0.9, p>0.01
	Rural	29 (100)	28 (90.32)	11 (100)	21 (72.41)	
UPs required only if patient is HIV positive	Urban	6 (9.52)	33 (37.93)	3 (18.75)	7 (20.59)	χ^2 =0.22, p>0.01
	Rural	10 (34.48)	11 (35.48)	2 (18.18)	4 (13.79)	
Routing testing mandatory for all patient undergoing surgery	Urban	60 (95.23)	82 (94.25)	3 (18.75)	NA	χ^2 = 0.0, p>0.01
	Rural	28 (96.55)	28 (90.32)	6 (54.55)	NA	
	Urban	63 (100)	87 (100)	16 (100)	34 (100)	
	Rural	29 (100)	31 (100)	11 (100)	29 (100)	

Table 2: Knowledge of isolation ward and hospital infection control committee.

			Respondents				
			Doctor (%)	Nurse (%)	Technician (%)	Servant (%)	Total (%)
Isolation ward	Urban	Yes	49 (77.78)	64 (73.56)	13 (81.25)	16 (47.06)	142 (71)
		No	14 (22.22)	23 (26.44)	3 (18.75)	18 (52.94)	58 (29)
	Rural	Yes	2 (6.90)	8 (25.81)	0 (0)	3 (10.34)	13 (13)
		No	27 (93.10)	23 (74.19)	11 (100)	26 (89.66)	87 (87)
			χ^2 = 89.8, p<0.01				
Hospital infection control committee	Urban	Yes	59 (93.65)	76 (87.36)	3 (18.75)	18 (52.94)	156 (78)
		No	0 (0)	3 (3.45)	13 (81.25)	2 (5.88)	18 (9)
		Don't know	4 (6.35)	8 (9.2)	0 (0)	14 (41.18)	26 (13)
	Rural	Yes	10 (34.48)	8 (25.81)	1 (9.09)	6 (20.69)	25 (25)
		No	11 (37.93)	23 (74.19)	6 (54.55)	8 (27.59)	48 (48)
		Don't know	8 (27.59)	0 (0)	4 (36.36)	15 (51.72)	27 (27)
	Urban		63 (100)	87 (100)	16 (100)	34 (100)	200 (100)
	Rural		29 (100)	31 (100)	11 (100)	29 (100)	100 (100)
			χ^2 = 78.24, p<0.01				

Table 3: Practice of correct waste disposal in colour coded bags.

		Respondents				
		Doctor (%)	Nurse (%)	Technician (%)	Servant (%)	χ^2
Gloves	Urban	48 (76.19)	76 (87.36)	3 (18.75)	33 (97.06)	χ^2=56.98, p<0.01
	Rural	12 (41.38)	14 (45.16)	4 (36.36)	6 (20.69)	
Food items	Urban	29 (46.03)	71 (81.61)	3 (18.75)	23 (67.65)	χ^2=19.5, p<0.01
	Rural	10 (34.48)	15 (48.39)	5 (45.45)	6 (20.69)	
Sputum	Urban	42 (66.67)	66 (75.86)	12 (75)	18 (52.94)	χ^2=37.1, p<0.01
	Rural	10 (34.48)	14 (45.16)	4 (36.36)	4 (13.79)	
Urine	Urban	40 (63.49)	48 (55.17)	14 (87.50)	11 (32.35)	χ^2=33.9, p<0.01
	Rural	8 (27.59)	6 (19.35)	3 (27.27)	4 (13.79)	
Toxic Drugs	Urban	35 (55.56)	50 (57.47)	3 (18.75)	1 (2.94)	χ^2=8.6, p<0.01
	Rural	15 (51.72)	6 (19.35)	3 (27.27)	3 (10.34)	
Human Organ	Urban	45 (71.43)	72 (82.76)	13 (81.25)	26 (76.47)	χ^2=14.27, p<0.01
	Rural	14 (48.28)	31 (100)	6 (54.55)	6 (20.69)	
Room Wastage	Urban	32 (50.79)	55 (63.22)	3 (18.75)	28 (82.35)	χ^2=25.6, p<0.01
	Rural	10 (34.48)	6 (19.35)	2 (18.18)	10 (34.48)	
	Urban	63 (100)	87 (100)	16 (100)	34 (100)	
	Rural	29 (100)	31 (100)	11 (100)	29 (100)	

Table 4: Practice of using needle.

		Respondents				
		Doctor (%)	Nurse (%)	Technician (%)	Total (%)	χ^2
Always Putting needles in sharp container	Urban	59 (93.65)	84 (96.55)	16 (100)	159 (95.78)	χ^2 =4.1
	Rural	28 (96.55)	25 (80.65)	10 (90.91)	63 (88.73)	p>0.01
Recapping Needle after using it	Urban	21 (33.33)	18 (20.69)	15 (93.75)	54 (32.53)	χ^2 =3.3
	Rural	14 (48.28)	12 (38.71)	6 (54.55)	32 (45.07)	p>0.01
	Urban	63 (100)	87 (100)	16 (100)	166 (100)	
	Rural	29 (100)	31 (100)	11 (100)	71 (100)	

All the HCWs i.e. 166 (100%) in urban and 71 (100%) in rural settings were using disposable syringe and needle. Out of these 159 (95.78%) HCWs in urban settings were putting needles in sharp container after using it. 32 (45.07%) HCWs in rural area were recapping needle after using it. For both this practice the urban and rural difference was not significant. As servants are not involved in using needles they were excluded for assessing this practice (Table 4).

DISCUSSION

Nosocomial infection and their control is a worldwide challenge. Next to the raised morbidity and mortality of patients, nosocomial infection furthermore increases the costs of healthcare due to added anti-microbial treatment and prolonged hospitalization.[9] In the present study, out of 300 HCWs, 200 were urban and 100 were rural healthcare workers and among them majority of were nurses. There were total 92 (30.6%) doctors, 118 (39.3%) nurses, 27 (9%) technicians, 63 (21%) servants in the study. While in the study conducted by Kotwal out of total 100 HCWs, 50 (50%) were doctors and 50 (50%) were nurses.[8] While in the study conducted by Suchitra et al, total 150 HCWs were taken and out of that 50 (33.3%) were doctors, 50 (33.3%) were nurses and 50 (33.3%) were ward aides.[10]

When assessing knowledge of mask if it was required or not for protection from splash 100% doctors gave the positive answer while it was only 80% in nurses in the study conducted by Kotwal.[8] In our study the positive answer were given by all the nurses (100%) and doctors (100%) in urban setting while it was 100% and 93% respectively in rural settings. Regarding knowledge of eye protection, it was found correct in 100% doctors and 74% nurses in study done by Kotwal.[8] While in our study 95% doctors and 94% nurses in urban setting; and 93% doctors and 80% nurses in rural setting gave the correct answer but this difference was not statistically significant. In study done by Kotwal, when HCWs were asked about self-protection regardless of patient diagnosis only 70% doctors and 74% nurses said yes.[8] While in our study 91 (99%) doctors and 107 (90%) nurses gave the positive answer. Regarding mandatory testing of patients undergoing surgery 80% doctors and 84% nurses gave the affirmative answer in study done by Kotwal.[8] While in our study it was in 95% (88) doctors and 93% (110) nurses. About the knowledge of HIV when they were asked about universal precaution 0% doctor and 42% nurses said that it is required only if patient is HIV positive in study done by Kotwal.[8] While in our study 16 (17%) doctors and 44 (37%) nurses said yes.

Correct practice of general waste disposal was noted in 69% of physician and 81% of nurses in the study conducted by Hakim et al.[11] While in our study 50% doctors and 63% nurses in urban settings and 34% doctors and 19% nurses in rural settings shown the correct waste disposal practice. Only 34% respondents shown the correct disposal of pharmaceutical waste in the study done by Sanjeev.[12] While in our study correct practice was seen in 89 (44.5%) HCWs in urban and 27 (27%) HCWs in rural settings. Das in his study noted that, in 33.3% observation, syringes were reused for the same patients and in 25% observation, syringes were reused for different patients but in our study all the HCWs were using the disposable syringes.[13]

CONCLUSION

From the above finding it can be concluded that all the HCWs were using disposable syringes but training regarding correct method of disposing various Bio-medical waste should be given from time to time as guideline is updated frequently by the government.

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