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Knowledge, Attitude and Practice of Universal Precautions: A Comparative Study between Urban and Rural Health Care Settings

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ABSTRACT

Introduction: Universal precaution is neglected issue in terms of spread of infection to patients; even in the urban heath care settings. So possibility of Health Care Associated Infection (HCAI) increases which leads to high morbidity and mortality.

Methodology: 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 (HCWs). In the present study 300 HCWs including Doctors, Nurses, Technicians and Servants were interviewed.

Results: Out of 300 HCWs; 80% were aware of various hand washing methods in urban health care settings. Practice of gloves usage was noted in 100% HCWs but correct practice of wearing and removing Personal Protective Equipment (PPE) was found only in 30% Doctors and 7% of Nurses.

Conclusion: Constant reinforcement of knowledge should be done and regular training should be given to change the behavior regarding Universal Precautions.

Key words: Universal Precautions, Urban Heath care Setting, Rural Health care setting, Health Care Associated Infection.

INTRODUCTION

Health Care Associated Infection (HCAI) occurs in about 5-10% of patient admitted in hospital in developed countries while this may exceed 25% in some developing countries.[1]Health Care Associated Infection attributes significant amount of morbidity and mortality among hospitalized patients worldwide and its control is a major challenge. About 75% of health infrastructure, medical man power and other health resources are concentrated in urban areas where 27% of the population liveswhile waterborne diseases and contagious infections like diarrhea, typhoid, amoebiasis, worm infestations show high morbidity in rural area.[2]

Hand hygiene is considered one of the most important infection control measures to prevent healthcare-associated infections as pathogens are generally transmitted via contaminated hands of Health Care Workers (HCWs). However, compliance with recommended hand hygiene procedures has remained below 50% of hand hygiene opportunities by heath care workers.[3]

Health care workers are at a great risk of exposure to blood and body fluids so they have high chances to get fatal infectious disease during their work. For creating awareness regarding occupation risk, CDC issued guideline as Universal Precaution (UPs) in 1987 which was later updated in 1996and 2007.[4] Even though the presence of guideline, Knowledge and understanding of Universal Precautions has been found to be inadequate among HCWs even in developed countries.[5]Occupational safety of HCWs has remained a neglected issue in developing countries like India where the situation is worse.[6]

Personal Protective Equipment (PPE) means a variety of barriers used alone or with combination to prevent skin, airways, mucous membranes and clothing from contamination with infectious agents. On the basis of patients interaction and the likely modes of disease transmission PPEs are selected. The order of wearing the Personal Protective Equipment is important as there are chances of getting contamination of PPE if they are not worn in particular order. PPE should also be removed in particular order.[7]

Evidence shows that the risk of infections can be reduced through good compliance with Universal Precautions which protect healthcare practitioners. However, there are many reasons for poor compliance. 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 Universal Precautions even among Technicians and Servants along with Doctors and Nurses where it is applicable.

MATERIAL AND METHODS

As per census 2011, Ahmedabad district is seventh highest in India in terms of population with 72,14,225 population.[8] Ahmedabad civil hospital is the biggest hospital of Asia. It has specialty and various super specialty departments and has high drains of patients from all over Gujarat and from nearby states like Rajasthan, Madhy 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 for urban and rural Health care setting of Ahmedabad district but it is not possible to mention all the data in one article so in present article only KAP of Universal Precaution is assessed. Expecting the prevalence of correct knowledge regarding Universal Precautions to be 50%, alpha 5% and Chance error ±10%, the sample size worker out to be 96; there for 100 Health Care Workers from Rural and 200 HCWs from Urban area were taken in the study.[9] 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.

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 Heath Care settings were selected through simple random technique which included 4 CHCs and 5 PHCs. Form these rural settings total 29 Doctors, 31 Nurses, 11 Technicians and 29 Servants were selected randomly.

These are the definitions used for the current study: (A) Social Hand Washing: Routine hand washing with soap and warm water to remove dirt and organic material, dead skin and most transient organisms. (B) Hygienic Hand Washing: Antiseptic hand disinfection with an antiseptic hand wash agent generally carried out for aseptic procedures on the ward and for areas of Isolation. (C) Surgical Hand Washing:Surgical hand washing requires the removal and killing of transient micro-organisms and substantial reduction and suppuration of the resident flora of the surgical team for the duration of the operation.[10]

Predesigned and pretested questionnaire was used for the data collection. Prior permission was taken from the respected authority for the data collection. The performa 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. Significance of difference is measured between urban settings and rural settings taking all the HCWs as one group. Tables in results are mentioned in different categories of HCWs to describe the proportion details.

RESULTS

Out of 200 HCWs in urban settings knowledge was more in doctors regarding hand washing methods while only 6(17.65%) servants knew about the various methods. The same situation was also seen in rural area. In general 80% (159) of HCWs were aware about various hand washing methods in urban area which was more as compare to rural area where awareness was among 57% (57) HCWs only and this difference was statistically significant with $P<0.05$ and $\chi^2=16.7$.**(Table 1)**

It was seen from the study that all the HCWs were using gloves in both urban and rural area but situations were different for using gloves.

Table 1: Knowledge of Hand Washing Methods among Health Care Workers of Urban and Rural Settings. (n=300, Urban=200, Rural=100)

Knowledge	Health Care Workers			
	Doctors	Nurses	Technicians	Servants
No knowledge				
Urban	2 (3.17)	10 (11.49)	1 (6.25)	28 (82.35)
Rural	2 (6.89)	3 (9.67)	9 (81.82)	29 (100)
Knowledgeable				
Urban	61 (96.83)	77 (88.51)	15 (93.75)	6 (17.65)
Rural	27 (93.11)	28 (90.33)	2 (18.18)	0 (0)
Total				
Urban	63(100)	87 (100)	16(100)	34 (100)
Rural	29 (100)	31(100)	11(100)	29(100)
Surgical*				
Urban	55 (90.16)	59 (76.62)	4 (26.66)	2 (33.33)
Rural	23 (85.18)	59 (76.62)	0 (0)	0 (0)
Hygienic*				
Urban	16 (26.22)	48 (62.33)	9 (60.0)	4 (66.66)
Rural	12 (44.44)	16 (57.14)	2 (100)	0 (0)
Social*				
Urban	6 (9.83)	23 (29.87)	2 (13.33)	0 (0)
Rural	8 (29.62)	13 (46.42)	0 (0)	0 (0)

*calculated from those who know about hand washing,
*Multiple responses; Figure in parenthesis indicate percentage

Table 2: Practice of using gloves among Health Care Workers of Urban and Rural Settings (n=300, Urban=200, Rural=100)

Practice	Health Care Workers			
	Doctors	Nurses	Technicians	Servants
Using gloves				
Urban	63(100)	87 (100)	16(100)	34 (100)
Rural	29 (100)	31(100)	11(100)	29(100)
Changing in between patients				
Urban	50(79.37)	76(87.36)	2 (12.5)	1 (2.94)
Rural	25 (86.21)	25(80.65)	2(18.18)	10(34.48)
During specimen transportation				
Urban	54 (85.71)	74(85.06)	16(100)	25(73.53)
Rural	26 (89.66)	31 (100)	7(63.64)	29 (100)
During specimen collection				
Urban	60 (95.24)	81(93.10)	16(100)	NA
Rural	27 (93.10)	31 (100)	9(81.82)	NA
During examination				
Urban	53 (84.13)	60(68.97)	NA	NA
Rural	25 (86.21)	29(93.55)	NA	NA
Total (%)				
Urban	63(100)	87 (100)	16(100)	34 (100)
Rural	29 (100)	31(100)	11(100)	29(100)

Figure in parenthesis indicate percentage

In general Servants are not involved in specimen collection and examination while technicians are not involved in examination so they were not assessed for the respected practice. During patient's examination 90%(54) HCWs were using gloves in rural area while this proportion was as low as 75.3%(113) in urban settings. For other situations difference between urban and rural area was not so much, so for any of the situation difference was not statistically significant **(Table 2).**

In rural area compliance of mask usage was high est among doctors 27(93.1%) while in urban areas technicians shown the highest compliance 14(87.5%). None of the Technicians and Servants was using simple cotton mask in urban area. In urban settings out of 200, 162(81%) HCWs and in rural settings out of 100, 86(86%) HCWs were using mask but this difference was not significant **(Table 3).** Shoes and Goggles usage while operating is not applicable for technician and servant so they were excluded. No Significant difference is seen between urban and rural setting for the use of apron, shoes and goggles during operation (**Table 4).** It was observed that the number of HCWs knowing the correct order of wearing and removing PPE was same and the difference between urban and rural settings was not significant **(Table 5).** Attitude of Health Care Worker was very much positive as all the HCWs i.e. 200 in urban and 100 in rural health care settings felt that Universal Precaution was very much effective to prevent infection.

DISCUSSION

The success of preventing infection among HCWs is dependent upon the compliance to Universal Precaution which in turn depends upon their perception regarding UP's effectiveness.

It is unacceptable to put patients' lives at risk and which is mainly due to lack of awareness and recognition of HCAIs.[11] Incomplete understanding of the principles underlying UPs among HCWs affects their practice which leads to reduction in compliance.[9]

Many studies have been done assessing KAP of various HCWs but no one has compared urban and rural area so it is difficult to discuss in term of urban and rural settings. In this study it could be conclude that the level of knowledge regarding hand washing was more in doctor as compare to nurses which is similar with the study done by Anupam Kotwal.[9] It showed that misconceptions persist despite a high level of awareness regarding UPs and nurses had an overall low level of correct knowledge as compared with doctors. These findings are opposite to the study done by JB Suchitra et al which said doctors were least compliant while ward aides who were under direct supervision of a hospital supervisor complied the best.[12] The study done by Gershon et al showed that the compliance was maximum among nurses, intermediate for technicians and the least for doctors.[13] Low level of compliance with UPs among HCWs had also been noted in studies done by Roberts C, Kermode M et al and Vaziri S et al.[5,14,15]All the four groups whether it is urban or rural settings were more aware about surgical and hygienic hand washing the probable reason may be that, being HCWs they

Table 3: Practice of using mask among Health Care Workers of Urban and Rural Settings (n=300, Urban=200, Rural=100)

Practice	Health Care Workers			
	Doctors	Nurses	Technicians	Servants
Using Double Layered Mask				
Urban	45 (71.42)	58 (66.66)	14 (87.5)	21 (61.77)
Rural	19 (65.51)	16 (51.61)	6 (54.55)	18 (62.07)
Using Simple Cotton Mask				
Urban	10 (15.88)	14 (16.10)	0 (0)	0 (0)
Rural	8 (27.59)	12 (38.71)	4 (36.36)	3 (10.34)
Not using Mask				
Urban	8 (12.70)	15 (17.25)	2 (12.5)	13 (38.23)
Rural	2 (6.90)	3 (9.68)	1 (9.09)	8 (27.59)
Total (%)*				
Urban	63(100)	87 (100)	16 (100)	34 (100)
Rural	29 (100)	31 (100)	11 (100)	29 (100)

*χ^2=1.16 , p=0.282; Figure in parenthesis indicate percentage

Table 4: Practice of using Apron, Shoes, Goggles among Health Care Workers of Urban and Rural Settings (n=300, Urban=200, Rural=100)

Practice	Health Care Workers				
	Doctor	Nurse	Technician	Servant	Total
Apron*					
Urban	35(55.56)	45(51.72)	16 (100)	24(70.59)	120(60)
Rural	17(58.62)	28(90.32)	9 (81.82)	10(34.48)	64 (64)
Shoes while operating#					
Urban	22(34.92)	32(36.78)	NA	NA	54 (36)
Rural	12(41.38)	12(38.71)	NA	NA	24 (40)
Goggles while operating$					
Urban	12(19.05)	27(31.03)	NA	NA	39 (26)
Rural	6 (20.69)	6 (19.35)	NA	NA	12 (20)

*P=0.502; #p=0.588; $P=0.359;
Chisquare test was used to calculate p value

Table 5: Practice of using Personal Protective Equipments among Health Care Workers of Urban and Rural Settings (n=300, Urban=200, Rural=100)

Personal Protective Equipment	Health Care Workers		
	Doctor (%)	Nurse (%)	Total (%)
Correct Order of wearing*			
Urban	16 (25.4)	8 (9.20)	24 (16)
Rural	12 (41.38)	0 (0)	12 (20)
Correct Order of Removing#			
Urban	16 (25.4)	8 (9.20)	24 (16)
Rural	12 (41.38)	0 (0)	12 (20)
Total			
Urban	63 (100)	87 (100)	150 (100)
Rural	29(100)	31(100)	60(100)

*P=0.487; #p=0.487; Chisquare test was used to calculate p value

are more frequently encountered to surgical and hygienic hand washing so they can more quickly recall these methods compare to social hand washing.

Anupam Kotwal reported in his study that practice of gloves was more in doctors (90%) as compare to nurses (80%).[9] In our study we could find out that all HCWs were using gloves at some point of time but looking at special condition like usage during specimen collection, specimen transportation compliance was more in technicians in urban setting while it was more in nurses in rural settings. High patient load could be the reason for not changing gloves during examination in urban settings.

Regarding practice of apron, eye protection and mask AnupamKotwal reported that 50% of doctors and 20% of nurses were using apron, 60% of doctors and 48% of nurses were using mask while no any doctor or nurses was using eye protection. So regarding eye protection, compliance was low in both urban and rural setting which is comparable with Anupam Kotwal.[9]

When asked about Universal Precaution 100% doctors and 84% nurses said that it was effective in study done by Anupam Kotwal.[9] In our study all the HCWs i.e. 92 doctors, 118 nurses, 27 technician and 63 servants said that Universal Precaution is effective in preventing disease transmission. JB Suchitra et al noted in the study that 58% and 32% doctors felt universal precaution protective and compulsory respectively as compared with 16% and 14% doctors who perceived universal precautions expensive and cumbersome respectively.[12] While universal precautions were felt protective and compulsory by 72% and 60% nurses respectively. Only 2% found it cumbersome and 14% found expensive. Among ward aides, a different trend of thoughts was observed. Most of them found universal precautions expensive (74%) and cumbersome (26%). Around 12% of the ward aides found it protective and 6% compulsory.

CONCLUSTION

It can be concluded that intensive IEC regarding hand hygiene is required in rural area as awareness was so much low that none of the servants was aware about hand washing technique in rural area; even in urban area servants had very much low knowledge of hand hygiene. Although all the HCWs were using gloves at some time but they were neglecting the use in some procedure so behavior change communication is required which make them realize that every procedure has potential to transmit the infection. In rural area none of the nurses knew correct order of putting up personal protective equipment.

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