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AWARENESS ABOUT NOSOCOMIAL INFECTIONS AMONG NURSES AND HEALTHCARE WORKERS OF HOSPITAL IN MEERUT UP

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ABSTRACT

Physicians, nurses and health care workers are exposed to hospitals for long duration which increases their risk of acquiring infections. Infection control practices are geared towards reduction of occurrence and transmission of infectious diseases. Hundreds of millions of patients are affected by Hospital-acquired infection (HAI) worldwide each year, leading to significant patient mortality rates and financial losses for health systems. Education and training of healthcare workers about standard infection control can reduce the extent of risks of nosocomial infection. Nurses have a critical role to play in prevention measures and infection control and they should have the opportunity for continuous professional development. To assess the knowledge, and practices of nurses and Healthcare workers of Hospital in Meerut. A pre-designed, pre-tested, anonymous self-administered, semi-structured questionnaire was given to each respondent. Data was collected over a period of four months from September to December 2013. As results shows that, 102 respondents were participated in this study. There was poor knowledge about the hand hygiene 83.33%, use of gloves 61.76% and use of mask, goggle and gown 58.82%. Thus it was concluded that the knowledge about nosocomial infection was poor. A serious effort like educational training is needed to improve the knowledge on nosocomial infection is necessary for nurses and health workers.

Key words: Nosocomial Infection, Hand Hygiene, Knowledge And Practice, Nurses, Healthcare Workers.

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INTRODUCTION

Nosocomial infections are new localized or systemic infections that develop in patients receiving medical care in a hospital or other healthcare facilities. The infections are not incubating or present during a patient's admission into the healthcare facility and are identified at least forty-eight to seventy-two hours following the patient's admission. Hospital-acquired infection (HAI) or healthcare-associated infection (HAI), or nosocomial infection acquired in healthcare settings are the most frequent adverse events in healthcare delivery worldwide [1].

Hospital Acquired Infection also includes occupational infections among healthcare staff. Hundreds of millions of patients are affected by HAI worldwide each year, leading to significant patient mortality rates and financial losses for health systems [2].

The Center for Disease Control and Prevention (CDC) in 1996, introduced a revised version of a preventive concept against nosocomial infections that originated in the 1960s. Standard precautions have been recognized as an efficient and effective means to prevent and control health care-associated infections in patients and health workers [3].

Standard Precautions included hand hygiene, use of personal protective equipment (e.g., gloves, gowns, masks), safe injection practices, safe handling of potentially contaminated equipments or surfaces in the patient environment, and respiratory hygiene/cough etiquette [4].

Healthcare workers should be familiar with practices to prevent the occurrence and spread of Nosocomial infections. Health care professionals are constantly exposed to microorganisms. Many of which can cause serious or even lethal infections [5].

Nurses in particular are often exposed to various infections during the course of carrying out their nursing activities and due to accidental contamination during their practical occupational exposure [6].

World Health Organization (WHO) has compiled guidelines in this regard in order to reduce the prevalence of health care associated infections. [7]. Despite the guidelines developed in several countries, compliance with aseptic precautions is known to be "poor and lacking" [8].

Healthcare associated infections due to poor hand hygiene has been linked to an unacceptably high level of morbidity, mortality and healthcare costs [9].

A Study conducted by AbdElaziz KM et al, that compliance with hand hygiene protocols by health care workers (HCW) is poor due to several constraints, including heavy work load, high number of clinical procedures and skin conditions of the health care workers.[10] Another study conducted by Jang J.H., et al, suggested that the knowledge, attitudes, compliance and reasons for non-adherence to hand hygiene [11]. An another study revealed that contribute to non-compliance with standard precautions include lack of understanding and knowledge among health care workers on how to properly use protective barriers lack of time ,lack of resources, and lack of proper training [12].

The main objective of this study was to assess knowledge, and practices of nurses and paramedical health care workers in a Hospital of Meerut.

MATERIALS AND METHODS

This cross-sectional study was designed as a descriptive study to evaluate knowledge and attitudes and practice of 75 nurses and 27 paramedical health workers who are working in a Subharti hospital Meerut. Respondents were selected through random sampling for the study. A pre-designed, pre-tested, anonymous self-administered, semi-structured questionnaire was given to each respondent. Data was collected over a period of four months from September to December 2013.

The purpose of the study was explained to all participants and their consent was obtained. Confidentiality and anonymity of the respondents were maintained. A formal permission was obtained from the concerned authorities of institution. The study was approved by the departmental Health Ethical Committee. Data generated was analyzed and Chi square test was used. A p-value of equal to or less than 0.05 was considered statistically significant.

RESULTS

Table 1 shows the socio-demographic profile of respondents. There were 102 respondents in the study. There were 75 (73.5%) female nurses and 27 (26.5%) paramedical health care workers were studied. Majority of the respondents 54 (52.9%) were within the age of 21 to 25 years old. Majority of the respondents 60 (58.8%) were unmarried while 40 (39.21%) were married.

Table 2 shows the Knowledge and practice of prevention regarding nosocomial infection. Majority of the respondents 74 (72.54%) agreed that invasive procedures increase the risk of nosocomial infection, while 71(69.60%) believed that the environment is the major source of bacteria responsible for nosocomial infection.

In prevention of germs transmission to patients was suggested by 85 (83.33%) and 77(75.49%) respondents suggested that hands should be washed before and after every a clean/aseptic procedure. 80(78.43%) told that hands should be washed before and after contact with patients. 65 (63.72%) told that hands should be washed with antibacterial for 10 to 15 seconds, 43 (42.15 %) always wash and rinse hands using firm rubbing and circular movement.

Holding hands lower than the elbow for water to flow from arm to finger was followed by 40 (39.21 %) health workers always. 48 (47.05%) respondents said hands and arms should be dried using disposable towels and discarded immediately.

65 (63.72%) used ordinary soap, 33 (32.35%) did medicated \rub and 54 (52.94%) had used running water.

63 (61.76%) of the respondents agreed with the use of gloves when there is a risk of contact with blood or body fluids, while 30(29.41%) thought that gloves should be used for all procedures. 60(58.82%) respondents knew that when there is a risk of splashes or spray of blood and body fluids, the health care workers must wear mask, goggles, and protective suit or gown when performing procedures that might induce spraying of blood, body fluid, secretions and excretions.

DISCUSSION

This study showed that knowledge about nosocomial infection was the lowest among the nurses and Healthcare workers. (72.54%) respondents agreed that invasive procedures increase the risk of nosocomial infection, while (69.60%) believed that the environment is the major source of bacteria responsible for nosocomial infection. Respondents did not know exactly what or who were the main sources of bacteria responsible for nosocomial infection. Vast majority of them thought that the environment was the only source of bacteria. This reinforces the need to intensify and strengthen teachings regarding standard precaution in classrooms. A survey

done by Ojulong J et al suggested that, only 24.1% of all respondents gave a correct answer to the question related to the environment (air, water, inert surfaces) as the major source of bacteria responsible for Nosocomial infection. [13] This result however is not comparable with studies conducted by previous authors [14].

Effective hand hygiene is essential for reducing healthcare associated infections. However, compliance of healthcare workers to hand hygiene guidelines are reportedly poor. It is important therefore to instill adequate knowledge and good attitudes and practices at the time of primary training of the healthcare workers. A study done by Snow et al. (2006) reported that the hand hygiene practices of mentors influence the hand hygiene practices of students [15] In our study, The practice of hand hygiene was 85 (83.33%) among the health workers, both study groups had moderate knowledge on hand hygiene. In a study conducted by Randle J et al revealed that self-reported compliance of hand hygiene is higher than the actual compliance during the working shift. However, having regular hand hygiene campaigns, displaying posters and encouraging peers to remind colleagues of hand hygiene has been shown to improve the compliance of HCWs significantly [16]

In our study 75.49% respondents washed hands before and after every clean/aseptic procedure. 78.43% respondents washed before and after contact with patients. 63.72% respondents washed their hands with antibacterial thoroughly for 10 to 15 seconds.

The Center for Disease Control and Prevention (CDC) recommends antimicrobial soap plus vigorous hand washing under a stream of water for at least 10 seconds.

On holding hands lower than the elbow for water to flow from arm to finger 40 (39.21 %) health workers does it always. 42.15 % thoroughly wash and rinse hands using firm rubbing and circular movement always when washing the hands. 47.05% respondents did drying of hands and arms using disposable towels.

In a study by Idnag N et al hand washing thoroughly with soap always by nurses came out to be 41.02%. and 38.2% nurses always washed hands thoroughly for 10 – 15 seconds with medicated lotions, On holding hands lower than the elbow for water to flow from arm to finger 48(47.1%) nurses does it always and (35.3%) used firm, rubbing circular movement always when washing [17].

In this study, hand washing by nurses and health workers revealed that 63.72% with ordinary soap, 32.35% with medicated rub and 52.94% with running water. In a study conducted by AbdElaziz, et al (2008) revealed that use of alcoholic hand rub solutions or gels has been shown to be effective for hand antisepsis [18].

Table 1. Socio-Demographics profile of respondents

S.No	Variables	Nurses		Paramedical Staff		Total		P-Value/Sig.	
		Freq.	%	Freq.	%	Freq.	%		
1	**Study Sample**	75	73.5	27	26.5	102	100.0		
2	**Sex**								
	F	70	93.3	5	18.5	75	73.5	0.001	SIG.
	M	5	6.7	22	81.5	27	26.5		
3	**Age**								
	18-21 years	10	13.3	5	18.5	15	14.7		
	21-25years	40	53.3	14	51.9	54	52.9		
	25 -30	20	26.7	5	18.5	25	24.5	0.7034	NS
	30 above	5	6.7	3	11.1	8	7.8		
4	**Marital Status**								
	Married	30	40.0	10	37.0	40	39.2		
	Unmarried	45	60.0	15	55.6	60	58.8	0.058	NS
	Others	0	0.0	2	7.4	2	2.0		

Table 2. Knowledge of Precaution Nosocomial Infection

a. Most frequent source of germs responsible for health care associated infections

S.No	Nurses (N=75)	%	Paramedical Staff (N=27)	%	Total (N=102)	%	χ^2-Value (P-Value)
I- Invasive procedures increase the risk of nosocomial infection.							
Y	60	80.0	14	18.7	74	72.5	7.9
N	15	20.0	13	17.3	28	27.5	0.005
II-The environment is the major source of bacteria responsible for nosocomial infection.							
Y	55	73.3	16	21.3	71	69.6	1.9
N	20	26.7	11	14.7	31	30.4	0.172

b. Precautions for protect both health care workers and patients from transmission of infection

S.No	Nurses (N=75)	%	Paramedical Staff(N=27)	%	Total (N=102)	%	χ^2-Value (P-Value)
2A-Hand hygiene actions that prevent transmission of germs to the patients							
Y	67	89.3	18	24.0	85	83.3	7.34
N	8	10.7	9	12.0	17	16.7	0.007
2B- Hand hygiene actions prevents transmission of germs to the health care workers							
I- Hands should be washed Immediately before a clean/aseptic procedure							
Y	62	82.7	15	20.0	77	75.5	7.89
N	13	17.3	12	16.0	25	24.5	0.005
II-Hands should be washed before and after touching with each patient							
Y	65	86.7	15	20.0	80	78.4	11.359
N	10	13.3	12	16.0	22	21.6	0.001
III-Health workers should wash their hands with antibacterial thoroughly for 10 to 15 seconds							
Y	57	76.0	8	10.7	65	63.7	18.47
N	18	24.0	19	25.3	37	36.3	0.0001
IV-Hold the hands lower than the elbow for water to flow from arms to the finger							
Y	31	41.3	12	16.0	43	42.2	0.079
N	44	58.7	15	20.0	59	57.8	0.779
V-Thoroughly wash and rinse hands using firm rubbing and circular movement							
Y	34	45.3	6	8.0	40	39.2	4.45
N	41	54.7	21	28.0	62	60.8	0.034
VI- Thoroughly dry hands and arms using disposable towels and discarded immediately							
Y	40	53.3	8	10.7	48	47.1	4.48
N	35	46.7	19	25.3	54	52.9	0.034
2C- Type of hand wash is most important							
I-Ordinary soap							
Y	57	76.0	8	10.7	65	63.7	18.47
N	18	24.0	19	25.3	37	36.3	0.0001
II-Medicated hand rub							
Y	28	37.3	5	6.7	33	32.4	3.21
N	47	62.7	22	29.3	69	67.6	0.073
III-Fresh Running water							
Y	40	53.3	14	18.7	54	52.9	0.0175
N	35	46.7	13	17.3	48	47.1	0.895
IV-Others							
Y	20	26.7	10	13.3	30	29.4	1.028
N	55	73.3	17	22.7	72	70.6	0.311

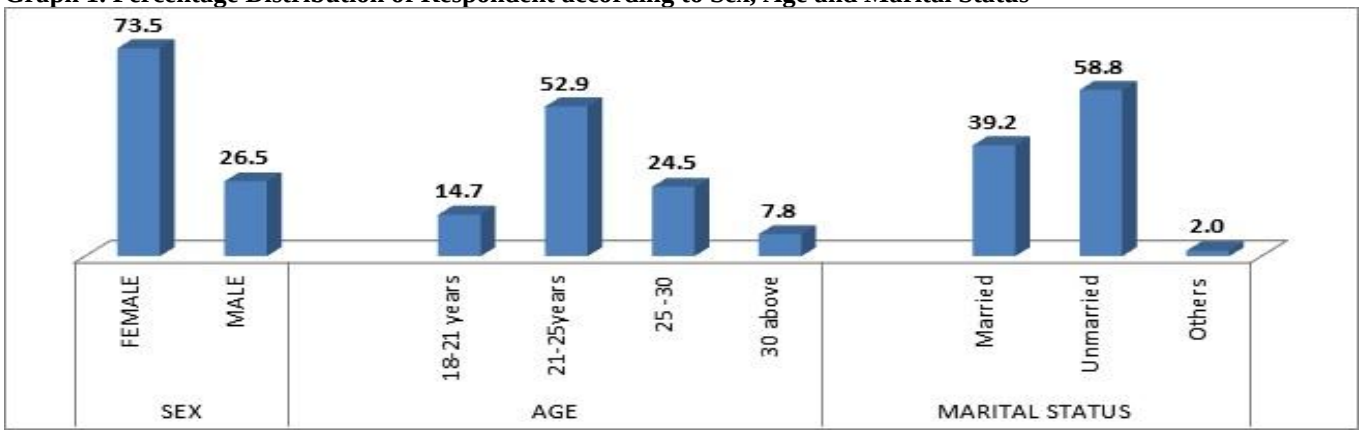
c. When there is a risk of contact with the blood or body fluid. What should do?

S.No	Nurses (N=75)	%	Paramedical Staff (N=27)	%	Total (N=102)	%	χ^2-Value (P-Value)
I-Use of gloves when there is a risk of contact with blood or body fluids							
Y	50	66.7	13	17.3	63	61.8	2.88
N	25	33.3	14	18.7	39	38.2	0.089
II-Gloves should be used for all procedures.							
Y	25	33.3	5	6.7	30	29.4	2.09
N	50	66.7	22	29.3	72	70.6	0.147

d. When there is a risk of splashes or spray of blood and body fluids

S.No	Nurses (N=75)	%	Paramedical Staff (N=27)	%	Total (N=102)	%	χ^2-Value (P-Value)
I- Health care workers must wear mask, goggles, and gown during clean and aseptic procedure							
Y	42	56.0	18	24.0	60	58.8	0.93
N	33	44.0	9	12.0	42	41.2	0.334

Graph 1. Percentage Distribution of Respondent according to Sex, Age and Marital Status



However the overall correct responses regarding appropriate use of hand rub and hand washing was unsatisfactory and there were several gaps in their knowledge with regard to the accurate procedure. The availability of hand rub solutions in hospitals.

A study of Sulaiha SA, et al [19] and Lam BC, et al [20] showed that efforts need to be focused to raise awareness regarding the impact of healthcare associated infections and implications of hand hygiene by holding seminars and group discussions and providing written instructions and posted reminders.

In our study, 61.76% of the respondents agreed with the use of gloves when there is a risk of contact with blood or body fluids, while 29.41% think that gloves should be used for all procedures. In a study conducted by Leodoro J. et al suggested majority of the respondents adheres to wearing of mask and protective suit or gown when performing procedures that might induce spraying of blood, body fluid, secretions and excretions with compliance rates of 94.8% [21].

This study suggests that (58.82%) of the respondents knew that mask, goggles and gown must be worn by the health workers when there is a risk of splashes or spray of blood and body fluids, surprisingly compliance with the use of protective eye patch or eye goggle was relatively low. This may be attributed to unavailability of personal protective equipments in every ward of the hospitals where they are rotated.

This finding is similar with that of Luo et al. where they observed that the use of protective items such as eye shields, masks, and quarantine clothes among Chinese nurses had the lowest compliance [22]. In another study done by Sadoh et al. observed that less than two-thirds of health care workers used personal protective equipment such as aprons, gowns and gloves, during surgery and deliveries [23].

CONCLUSION

The Knowledge about nosocomial infection among nurses and healthcare workers were poor. There was poor attitude and practices about the nosocomial infections such as hand hygiene 83.33%, use of gloves 61.76% and use of mask, goggle and gown 58.82%. Overall, the findings in this study suggest that respondents had poor knowledge and practice about nosocomial infections.

Further display of infection prevention notices, easy access to hand hygiene facilities at the training centers and active involvement of staff to emphasize the importance of correct hand hygiene as well as encouraging students to follow good hand hygiene practices will be useful in increasing hand hygiene compliance among these nurses and health care workers. It is important to carry out training programmes on hand hygiene regularly for health care workers as it has been associated with increased compliance to hand hygiene practices and reduction of infection. Serious efforts like educational training is needed to improve the knowledge on nosocomial infection are necessary for nurses and health workers.

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CONFLICT OF INTEREST

The author(s) declare(s) that there is no conflict of interests regarding the publication of this paper.

REFERENCES

1. WHO. (2003). Prevention of hospital-acquired infections, a practical guide. Geneva, World Health Organization, 2002.
2. Burke JP. Infection control - a problem for patient safety. *N Engl J Med*, 348, 651-6.

3. Garner JS. (1996). Guideline for isolation precautions in hospitals. The Hospital Infection Control Practices Advisory Committee. *Infect Control Hosp Epidemiol*, 17, 53-80.
4. Centers for Disease Control. (1988). Update, Universal Precautions for prevention of transmission of human immunodeficiency virus, hepatitis B virus, and other blood borne pathogens in health-care settings. *MMWR*, 37, 377-388.
5. Twitchell KT. (2003). Bloodborne pathogens. What you need to know–Part II. *AAOHN J*, 51(2), 89-97.
6. Kosgeroglu, N., Ayranci, U., Vardareli, E., &Dincer, S. (2004). Occupational exposure to hepatitis infection among Turkish nurses, frequency of needle exposure, sharps injuries and vaccination. *Epidemiol Infect*, 132(1), 27-33.
7. WHO Guidelines on Hand Hygiene in Health Care First Global Patient Safety Challenge Clean Care is Safer Care. 2009.
8. Jawaid M, Iqbal M, Shahbaz S. (2009). Compliance with standard precautions, a long way ahead. *Journal of Public Health*, 38, 85-8.
9. Trampuz A., Widmer A.F. Hand Hygiene. (2004). A frequently missed lifesaving opportunity during patient care. *Mayo Clin Proc*, 79,109-116.
10. AbdElaziz KM, Bakr IM. (2009). Assessment of knowledge, attitude and practice of hand washing among health care workers in Shams University Hospitals in Cairo. *J Prev Med Hyg*, 50(1), 19-25.
11. Jang JH, Wu S, Kirzner D, Moore C, Youssef G, Tong A, Lourenco J, Stewart RB, McCreight LJ, Green K, McGeer A. (2010). Focus group study of hand hygiene practice among healthcare workers in a teaching hospital in Toronto, Canada. *Infect Control Hosp Epidemiol*, 31(2), 144-50.
12. Vaz1 K, McGrowder1 D, Alexander-Lindo R, Gordon L, Brown P, Irving R. (2010). Knowledge, Awareness and Compliance with Universal Precautions among Health Care Workers at the University Hospital of the West Indies, Jamaica. *International Journal of Occupational and Environmental Medicine*, 1(4), 171-181.
13. Ojulong J, Mitonga KH, Iipinge SN. Knowledge and attitudes of infection prevention and control among health sciences students at University of Namibia African Health Sciences, 13(4), 2013.
14. Parmeggiani C, Abbate R, Marinelli P & Angelillo IF. (2010). Healthcare workers and health care-associated infections, knowledge, attitudes, and behavior in emergency departments in Italy. *BMC Infect Dis*, 10(1), 35.
15. Snow M, White G L. Jr, Alder SC & Stanford JB. (2006). Mentor's hand hygiene practices influence student's hand hygiene rates. *Am J Infect Control*, 34, 8-24.
16. Randle J, Clark M, Storr J. (2006). Hand hygiene compliance in health care workers. *Journal of Hospital Infection*, 64, 205-209.
17. Idang N. Ojong, Mfon I. Etim, Faith F. Nlumanze, Margaret I. Akpan. (2014). The practice of hand washing for the prevention of nosocomial infections among nurses in general hospital IkotEkpene, AkwaIbom State. *Nigeria Archives of Applied Science Research*, 6(1), 97-101.
18. AbdElaziz KM, Bakr IM. (2008). Assessment of knowledge, attitude and practice of hand washing among health care workers in Ain Shams University hospitals in Cairo. *The Egyptian Journal of Community Medicine*, 2008, 26(2), 1-12.
19. Sulaiha S A, Wee Yun Ling, Lie Joo Chin, Wei-Liang Eow, Muhamad Faiz S, Noris Chien Fook Tan. (2010). The Lack of Effective Hand Washing Practice Despite High Level Of Knowledge And Awareness In Medical Students Of Clinical Years, *IeJSME*, 4(2), 18-26.
20. Lam BC, Lee J, Lau YL. (2004). Hand hygiene practices in a neonatal intensive care unit, a multimodal intervention and impact on nosocomial infection. *Pediatrics*, 114, 565-71.
21. Leodoro J. Labrague, Rheajane A. Rosales, Maricel M. izon. (2012). Knowledge of and Compliance with Standard Precautions among Student Nurses *International Journal of Advanced Nursing Studies*, 1(2), 84-97.
22. Luo Y, He GP, Zhou JW & Luo Y. (2010). Factors impacting compliance with standard precaution in nursing, china. International Journal of Infectious Diseases, 14(12), e1106-e1114.
23. Sadoh WE, Fawole AO, Sadoh AE, Oladimeji AO & Sotiloye OS. (2006). Practice of universal precautions among healthcare workers. *J Natl Med Assoc*, 98, 722-726.