Original article:

Assessment of Level of Knowledge and Practice Of Standard Precautions Of Infection Control Among Various Health Care Workers In A Tertiary Care Hospital Of Chhattisgarh ,

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ABSTRACT

Background: Healthcare workers (HCWs) are at high risk of contracting infections in hospitals. Standard Precautions (SPs) play a key role in effective control of these infections.

Aim: To assess the level of Knowledge and Practice among various HCWs regarding SPs of Infection Control.

Methods: A total of 60 HCWs, nurses (n=30) and lab technicians (LTs) (n=30) were included. A semi-structured questionnaire based interview schedule was conducted for the HCWs. Knowledge level was graded as Excellent, Good, Fair, Low and Poor. Practice level was analyzed considering strict adherence to practice, as good practice.

Observations & Results: Age of participants (n=60) varies from 20 to 59 years (mean 32.7 ± 19.4). More than 80% of respondents mentioned that there is increased risk of blood borne pathogens to them. Instantaneous management of sharp injuries was correctly known by 67.67% nurses & 73.33% LTs. A high percentage (73.33%) of HCWs admitted hand washing after handling patients. Compliance with various PPEs altered with the type of PPE and HCWs both.

Conclusion: Though knowledge level of SPs was found good among HCWs, but it did not translated into that good and appropriate practice in both the groups. Inconsistent and inadequate supply of the resources and lack of regular training on infection control were identified as the major perceived barriers for compliance of SPs. The findings suggest that Infection Prevention and Control committee needs to recognize the factors that enhance performance and accordingly plan the measures to sustain such factors.

Keywords: HCWs, SPs, Knowledge & Practice, Chhattisgarh

INTRODUCTION

The hospital not only allows the patients to cure, but also provides such an environment where patients as well as health care providers are prone to serious health care associated infections (HCAI), which have ruinous effect on their health & life.[1]

Even in modern and advanced health care delivery system, HCAI remains one of the most important factors accounting to considerable morbidity and mortality in a hospital.[2]Current literature suggests that resource-limited countries are more burdened with HCAI.[3,4,5]

Healthcare workers (HCWs) are at high risk of contracting infections, as they are comparatively more exposed to blood and body fluids. Exposure to these fluids can occur through a percutaneous injury [needle-stick injury (NSI)] or mucocutaneous splash. Every year around 3 million HCWs are exposed to blood-borne viruses worldwide.[6]

It is difficult to identify the patients infected with blood borne pathogens simply by medical history and routine clinical examination. So the assumption, that all patients could be a potential sources of infection, led to the issue of guidelines on Standard Precautions (SPs) by CDC.[7,8]

SPs, are the set of recommendations, designed to prevent or minimize exposure to infectious agents, following basic principles of infection control, strict adherence to which will prevent HCAIs in a simple and a effective manner. [9,10,11] The components of SPs include hand hygiene, injection safety, use of personal protective equipment(PPE), environmental cleanliness, waste management, respiratory hygiene and cough etiquette. SPs play a key role in effective infection control programme.[12,13]

Non-compliance of SPs may result in transmission of infection to other patients, visitors and HCWs. Non adherence with SPs among HCWs may be attributed to various factors including lack of knowledge and awareness, low degree of perceived risk, lack of infection control programs and limited resource availability. Despite of available guidelines, the knowledge and understanding of SPs among HCWs, both in developed and developing countries are reported to be sub optimal. [6,14] The compliance of SPs by HCWs may differ from one type of HCW to another, owing to differences in knowledge, experience and training received according to their professional groups.[7,15]

Thus assessment of existing knowledge and practice of SPs of infection control among various HCWs is a key step in planning and implementing a successful infection prevention and control (IPAC) programme in any health care setting. Equally important is to identify and fulfill the gap between knowledge and practice /compliance. [16]

Unfortunately, there is a scarcity of literature assessing the knowledge and practice of SPs of infection control among HCWs from Chhattisgarh state. Thus the present study was undertaken at Government Medical College and Hospital, Rajnandgaon, Chhattisgarh. The results of this study may be helpful in development and implementation of IPAC programme and related activities in the hospital

AIMS AND OBJECTIVES

1. To assess the level of Knowledge and Practice among various HCWs (Nurses and Laboratory Technicians) regarding Standard Precautions of Infection Control.
2. To identify various determinants affecting the compliance with Standard Precautions.

MATERIAL AND METHODS

Study design and participants

This cross sectional study was conducted over a period of 03 months, at Government Medical College and Hospital, Rajnandgaon, Chhattisgarh, which has recently been upgraded from district hospital to medical college hospital. It is a 300 bedded hospital catering its services to urban, rural and tribal population of Rajnandgaon district and its adjacent areas. The permission from the Hospital Superintendent was taken prior to data collection.

The study population comprised of 60 HCWs, which included nurses (n=30) and Laboratory Technicians (LTs) (n=30) of the hospital, who had worked for a minimum period of six months.

Data Collection and Analysis

The tool used for data collection was a semi structured questionnaire based interview schedule. An informed consent was obtained prior to the interview. Privacy and confidentiality of all the informants was maintained. Interviews were

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performed in the institution at a place and time convenient for the informant and the investigator without causing any hindrances to their daily routine. These questionnaires were checked for completeness and consistency upon collection, the content of which was adopted from review of qualitative and quantitative literature on SPs and infection control guidelines.[7,9,10,11,13,17]

Questionnaire comprised three categories of questions:

(1) Basic characteristics and demographic data: specialty, age, gender, duration of work, educational attainments, and previous training in infection control and SPs.

(2) Assessment of Knowledge and Practice towards infection control and SPs: Including general concepts of SPs and infection control; hand hygiene; personal protective equipment; sharps disposal and environmental sanitation; sharps injuries and occupational infection; and care of HCWs. Items were in the form of closed ended questions.

(3) Challenges preventing practice of infection control and SPs.

Knowledge level for a particular attribute of infection control and SPs was graded as Excellent, Good, fair, and Poor on the basis of percentage of correct responses to that attribute by the HCWs as follows- More than 90% considered Excellent, 90% to 70% as Good, 70% to 50% as Fair, 50% to 30% as Low, and less than 30% as Poor level of Knowledge. Level of Practice of Infection Control and SPs was analyzed considering strict adherence to practice ie ''practiced always'' was considered as good practice.

Data Collection, compilation and analysis was done as per standard statistical procedures. A comparative analysis was performed between two groups using Chi square test for significance. A p value of <0.05 was taken as statistically significant.

RESULTS

Age of participants (n=60) varies from 21 to 59 years (mean 32.7 ± 19.4). All the nurses and 56.67% LTs were females. Training in IPAC was received by 53.33% participants. Among all respondents 13.33% nurses and 10% of LTs admitted exposure to needle stick injury during last one year. Of all, 93.33% of participants were fully immunized with Hepatitis B vaccine. **[Table-1]** It was found that with increasing age and the duration of work experience of HCWs in the study, the level of knowledge and compliance also increased significantly (p value <0.05). **[Table-2]**

I. Knowledge:

It was noted that 80% of nurses and 73.33% of LTs have precisely illustrate the main aim of infection control, where as only about 50% could specifically describe the components of SPs. More than 80% of respondents mentioned that there is increased risk of blood borne pathogens to them, despite this majority failed to mention that SPs should be observed for all the patients for all the times **[Table-3]**

Only 60% of nurses and 50% of LTs could identify correct procedure and duration recommended for standard hygienic hand washing. A Misconception that alcohol based hand rubs (ABHR) can replace hand washing of soiled hand was found in more than 50% of LTs. More than one third of the participants mistakenly believed gloves can be used in place of hand washing. **[Table-3]**

Instantaneous management of sharp injuries was correctly known by 67.67% of nurses & 73.33% of LTs. Majority of the participants, believed not to recap or bend the needle after use. Only 33.33% of

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nurses and 30% of LTs said that needles should be removed manually before disposal. Most of the respondents correctly mentioned the proper disposal of used needles and syringes. **[Table-3]**.

Majority of nurses (60%) and LTs (53.33) have a misbelieve that risk of acquiring HAIs can be completely abolished by use of PPEs. Half of the LTs believed that gloves can be reused for multiple patients unless it is not visibly contaminated. More than a third of the participants wrongly thought that PPE are specifically essential for laboratory & cleaning staff for their protection, as they have a higher chance of exposure to biomedical wastes and sharps, so the need was optional for other HCWs. About 50% participants believed that Eye gear can protect them from splash. Correct identification of the sharp container was done by 80% of nurses and 86.67% of LTs. Colour coding of containers for waste segregation was known to majority of the participants. Disinfection was correctly meant by 70% of nurses and 67.67% of LTs. **[Table-4]**

II. Compliance:

Despite of 100% participants finding necessary to wash hands before and after patient care, only 80% of nurses and 67.67% of LTs always practiced the same. Compliance with various PPEs altered with the type of PPE and HCWs both. Among all participants, 76.67% of nurses & 80% of LTs always used gloves. A substantially fewer participants admitted to use ABHR and eye protection. **[Table-5]**

Graph-1 shows various hazardous needle practices followed by the study participants.

III. Perceived Barriers/challenges preventing compliance:

Graph: 2 displays the major perceived factor preventing use of PPEs, among which non-availability of PPE at point of patient care ranked topmost.

DISCUSSION

The study comprised of 60 HCWs, with a mean age of 32.7 ± 19.4 yrs. All the nurses were females, as this is a female predominating profession, and among LTs females were slightly higher than males, similar to the finding of various studies showing female predominance.[4,12,13,14]

Better knowledge, regular trainings, high perceived risk of infection and longer duration of work experience are found to be the main determinants of better compliance with SPs and infection control among various HCWs.[12,14,16,18] Significantly better knowledge and compliance of SPs and infection control with increased years of age and experience was reported in present study as well (p value < 0.05). Trained participants in infection control shown better awareness & compliance, though the difference was not statistically significant (p value >0.5), this might be due the fact that most of them had received training more than a year back. Lack of proper induction and less frequent refresher trainings could be cause of average level of awareness is present study group.

(A) Knowledge

The study participants shown a fair level of knowledge, with an average of 61.67% regarding general concepts of SPs and infection control. Similar were the findings of the studies from Nigeria & Saudi Arabia. [12,13] Likewise other studies, the overall knowledge of nurses was found better than LTs regarding general concepts, Hand hygiene, PPE and waste disposal, where as better awareness was found in LTs in management of sharps in our study, though the difference is not statistically significant (p value >0.5).[12,19,20]

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Awareness regarding hand hygiene was good in our study population with average knowledge level of 70%, supporting the findings of Nigerian study[21], conducted in year 2013 where knowledge on hand hygiene among HCWs was 83%. Many other studies shown good level of awareness and compliance in hand hygiene.[14,22] Nursing staff was found to have a better awareness regarding hand hygiene than LTs, though the difference is not statistically significant (p value >0.5). This could be ascribed to their undergraduate curriculum in which hand hygiene is emphasized greatly. For some aspects of hand hygiene like proper duration of hand washing and use of ABHRs, both the groups shown a low level of knowledge, as also noted by other studies.[12,13,14]

A fair level of awareness in over all PPE use was found in present study. Awareness level was found low in both the study group regarding use of eye gear, if studied separately. These finding are in confirmation with findings of the study in Jamaica in which it was found almost two third (64%) of respondents were knowledgeable of SPs[23], various other studies supported these findings.[4,6,24]

We reported a good level of knowledge regarding sharps management (SIPs & disposal) among both the groups. LTs shown a better awareness than nursing staff, though the difference was not statistically significant (p value >0.5).These findings are in total agreement with that of Tarek amin and A Al wahedy 2009, who stated that LTs showed higher score for sharps management, where as nurses were more knowledgeable regarding hand hygiene and care of HCWs[13,25]

Participants of the study shown a good knowledge for proper disposal of needles & syringes, where as awareness regarding recapping of needles was fair in both the study groups. Similar were the findings of various studies from India and other part of the world.[4,13,19,26]

(B)Level of Practice in Standard Precautions

As the SPs are mandatory for infection control, only strict adherence to all aspects can ensure freedom from the risk of transmission of infections, anything less than complete adherence to the protocols is unacceptable. Thus good practice was so defined as complete adherence to SPs.

Good Compliance with hand washing was observed by HCWs in several studies & also in present study[7,13,14,18,23],as this is simple procedure that require running water, would have been easy to practice besides it also attends to personal hygiene. In contrast low compliance of hand washing was observed among nurses in a study from New Delhi in 2010.[6]

Compliance with use of PPEs also varies with different types of PPE in both the study groups. Both nurses & LT show good compliance to use of gloves, same was reported by various workers from India and abroad.[7,18,24,27]

Similar to other studies, over all compliance to use of ABHRs was found low in both nurses and LTs,[6,12,13,14] main reason stated was non availability of ABHR at point of patient care. Our finding was in contrast with that of Punia S et al, who reported 43% of nurses using ABHR[24], the difference might be the due to ignorance and availability of hand rubs in different settings.

Present study reported a poor compliance of eye protective gears, similar to the Indian studies where only about third of HCWs wear eye protection.[18,24]

A study from north India reported that none of HCWs in their study group wore eye protection always.[6] On the contrary, compliance with the use of eye protective gear was found to be 63% in

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developed countries. Likewise, the developed countries, consistently used outer protective gown and head cover, whereas only about 36.67% of the participants in this study claimed using it always.[6,7,12,16,24,25,28] This might be due to lack of knowledge and non availability of these PPEs in various health care settings in developing countries.

In current study 11.67% participants reported at least one NSI in previous one year, which was similar to the findings of other studies,[7,24] where as higher proportion of NSI, (30-57%) have been reported in studies from north India and abroad.[29,30] It is a serious matter of concern that out of 11.67% NSIs reported in study, less than the half were acknowledged to concerned authority & received proper management. Similar is scenario in different studies from India and abroad making under reporting and improper management of NSI as a major risk factor for acquiring infections in HCWs.[18,24,29,31]

Inspite of the high perceived risk of getting exposed to blood borne infection, in present study, 5.88% of the participants had not completed the hepatitis B vaccine schedule. This is, however, better than the findings from studies conducted in other parts of India[6,24] and the United states[32], which reported a higher rate of incomplete hepatitis B vaccine.

(C)Barriers/ Challenges preventing the compliance with SPs

Perceived barriers of compliance directly affect HCW's ability and willingness to comply with SPs in daily practice. Non-availability of various PPE at the point of patient care was the topmost barrier stated by the participants preventing compliance, followed by finding PPE cumbersome or uncomfortable to wear. Whereas most common factor preventing HCWs from following SPs was stated to be time constrains, followed by excess work load lack of adequate resources and lack of functional I PAC committee and guidelines. Similar were the findings from various parts of India and abroad.[6,7,16,18,24]

CONCLUSIONS

Over all knowledge and awareness on the concept of IPAC and SPs was good among the participants, however it did not translated into that good and appropriate practice in both the groups. As the SPs are mandatory in infection control, anything less than full adherence to the protocols is unacceptable, as it does not provide a safe work environment for HCWs. Younger age groups, less experienced and untrained HCW had significantly less awareness level in most elements of SPs, that obviously translated into poor compliance. This suggests that routine practice and regular trainings on infection control will increase their level of awareness and compliance. Inconsistent and inadequate supply of PPEs, increased workload, lack of adequate facilities/resources for SPs, inadequate knowledge, and lack of regular and proper training on IPAC and SPs were identified as the major perceived barriers or factors that hinder positive performance. These findings are useful in planning appropriate measures to improve the knowledge, practice and compliance with IPAC and SPs among HCWs. IPAC committee in collaboration with hospital management team need to recognise the factors that enhance performance and accordingly plan the measures to sustain such factors.

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Table 1: DEMOGRAPHIC CHARACTERSTICS OF STUDY POPULATION.

Character	**Criteria**	**Nurses (N=30) n (%)**	**LTs (N=30) n (%)**
Age(**yrs**)	Mean age	38.33	32.66
Gender	Males	00 (00.00)	13(43.33)
	Females	30 (100.00)	17(56.67)
Work experience (**in years**)	Less than 5	12 (40.00)	15 (50.00)
	5 – 10	11 (36.66)	09 (30.00)
	More than 10	07 (23.33)	06 (20.00)
Training Status on Infection control	**Trained**	18 (60.00)	14 (46.66)
Vaccination status for Hepatitis B	**Fully vaccinated**	28 (93.66)	28 (93.66)
Exposure to Needle stick injury in last one year	**YES**	08 (13.33)	03 (10.00)

Table 2: KNOWLEDGE AND PRACTICE IN HCWs AS PER AGE AND WORK EXPERIENCE

AGE (in years)	**Knowledge level in HCWs (N=60)**			**Practice level in HCWs (N=60)**		
	Total	**Good Knowledge n (%)**	**P value**	**Total**	**Good compliance n (%)**	**P value**
21-30	15	06 (40.00)	<0.0286	15	07(46.66)	<0.0412
30-40	29	23 (79.31)		29	21(72.41)	
40-50	12	10 (83.33)		12	09(75)	
>50	04	02 (100)		04	04(100)	
Total Work Experience (in years)	**Total**	**Good Knowledge n (%)**	**P value**	**Total**	**Good compliance n (%)**	**P value**
<3	12	06(50.00)	<0.0457	12	04(33.33)	<0.007
3-5	15	10(66.66)		15	08(53.33)	
5-10	20	15(75.00)		20	14(70.00)	
10-15	09	07(77.77)		09	07(77.77)	
>15	04	02 (100)		04	04(100)	

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Table 3: KNOWLEDGE OF HCWS REGARDING GENERAL ASPECTS OF INFECTION CONTROL, HAND HYGIENE AND SHARP MANAGEMENT.

Correct answers are given in parentheses. T= true; F= false

S. No	Knowledge Domain	Correct responses	
		Nurses (N=30) n (%)	LTs (N=30) n (%)
A	**General Concepts**		
	The main aim of infection control?	24 (80)	22(73.3)
	Meaning of Standard Precaution?	16 (53)	14 (46.6)
	All patients are infectious regardless of their diagnosis (Y)	25(83)	21(70)
	All body fluids should be considered infectious (Y)	24(80)	18 (60)
	Assume all unsterile needles & sharps similarly contaminated (Y)	18 (80)	23 (76.66)
	All health care providers are at increased risk of getting HIV/HBV/HCV infection and other occupational infections (Y)	26 (86.66)	25 (83.33)
	What would you do if there is a blood/body fluid splash?	18 (80)	16 (53.3)
	Universal precaution should be followed for_____ patients.	16 (53.33)	14 (46.6)
B	**Hand Hygiene**		
	Infectious organisms can be found on normal intact skin of patients and HCWs. (Y)	18 (80)	12 (40)
	Use of gloves replaces the need for hand washing. (N)	18 (80)	15 (50)
	Washing your hands with soap and ABHR decreases the risk of transmission of pathogen. (Y)	24 (80)	20 (66.6)
	ABHR substitutes hand washing even if hands are soiled. (N)	19 (63.3)	13 (43.3)
	Hand washing reduces the chances of hospital acquired infections (Y)	24 (80)	20 (66.6)
	In routine hygienic hand washing minimum duration should be > 1min. (Y)	18 (60)	15 (50)
	While using ABHR, hands should be rubbed until dry. (Y)	21 (70)	20 (66.6)
	There is no need of hand washing prior to patient contact if hands are not visibly dirty (N)	21 (70)	16 (53.3)
	There is no need for hand washing before doing procedures that do not involve body fluids. (N)	20 (66.6)	18 (60)
	Hand wash should be done before & after patient contact (Y)	30 (100)	30 (100)
	Hand washing is needed with patients with respiratory infections (Y)	21 (70)	19 (63.33)
	Hand washing is indicated after removal of gloves (Y)	24 (80)	23 (76.66)
	Same pair of gloves can be used for multiple patients untill there is no	24 (80)	15 (50)

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	visible contamination. (N)		
	Hand washing is necessary before & after meals. (Y)	30 (100)	30 (100)
	Hand washing should be done uniformly is all areas of the hospital & for all patients. (Y)	24 (80)	21 (70)
C	**Sharp management**		
	Sharp injuries should be managed without reporting (N)	21 (70)	19 (63.33)
	Needle stick injuries are less commonly seen in general practice (N)	14 (46.66)	15 (50)
	Used needles should be recapped before disposal to prevent injuries (N)	18 (60)	20 (66.66)
	Used needles should be bent before disposal to prevent injuries (N)	23 (76.66)	24 (80)
	Used needles should be removed manually before disposal to prevent injuries (N)	20 (66.66)	21 (70)
	Sharp container is labeled with cross (N)	24 (80)	26 (86.66)
	Immediate management of sharp injuries includes washing in running tap water & soap. (Y)	20 (66.66)	22 (73.33)
	Soiled sharp objects should be shredded before final disposal(Y)	16 (53.33)	18 (60)
	For prevention of hepatitis B, immunizations are recommended for all healthcare workers(Y)	28 (93.33)	29 (96.66)
	Post exposure prophylaxis is used for managing injuries from HIV infected patients(Y)	15 (50)	18 (60)
	The risk for health care provider to acquire HIV infection after needle stick 0.5%. (Y)	14 (46.66)	15 (50)
	How to dispose used needles and syringes-	21 (70)	23 (76.66)

Table 4: KNOWLEDGE OF HCWS REGARDING PERSONAL PROTECTIVE EQUIPMENTS(PPE), WASTE DISPOSAL, OCCUPATIONALINFECTION AND ENVIRONMENT SANITATION.

Correct answers are given in parentheses. T= true; F= false

S. No.	**Knowledge Domain**	**Correct responses**	
		Nurses (N=30) n (%)	**LTs (N=30) n (%)**
A	**Personal Protective equipment (PPE)**		
	PPE such as masks & head caps provide protective barriers against infection. (Y)	21 (70)	18 (60)
	PPE should be chosen according to type of exposure & procedure(Y)	21 (70)	19 (63.33)
	Use of PPE completely abolish the risk of acquisition of HAIs (N)	12 (40)	14 (46.66)

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	PPE is specifically essential for laboratory & cleaning staff for their protection (N)	20 (66.66)	18 (60)
	PPE should be used only when contact with blood is anticipated (N)	25 (83.33)	24 (80)
	Gloves & masks can be used again after proper clearing (N)	20 (66.66)	19 (63.33)
	Used PPE should be discarded through regular municipal disposal system (N)	25 (83.33)	24 (80)
	Gloves should be changed between different procedures on the same patient (Y)	15 (50)	14 (46.66)
	Masks made of cotton or gauge are most protective (N)	16 (53.33)	15 (50)
	Masks & Gloves can be reused for same patient. (N)	16 (53.33)	14 (46.66)
	Eye gear protects from splash (Y)	15 (50)	14 (46.66)
	PPE should be used only when the patient is HIV positive (N)	18 (60)	16 (53.33)
B	**Waste disposal**		
	Is it necessary to categorize hospital waste before disposal (Y)	20 (66.66)	21 (70)
	How would you dispose infected material from patient.--	16 (53.33)	18 (60)
	Sharp container is labeled with cross. (N)	24 (80)	26 (86.66)
	Used gloves should be descended in blue bags (N)	20 (66.66)	21 (70)
	IV tubings, catheters should be descended is yellow bags (Y)	21 (70)	24 (80)
	Blood contaminated items should be disposed in black bags (N)	21 (70)	24 (80)
	Waste papers are descended is red bags. (N)	21 (70)	24 (80)
	You will cover patients vomit on the floor with disinfectant before wiping(Y)	21 (70)	19 (63.33)
C	**Occupational infection and Environmental Sanitation**		
	Health providers with higher risk of exposure to tuberculosis include radiologists (Y)	20 (66.66)	18 (60)
	MRSA stands for multi drug resistant Staphylococcus aureus organisms. (N)	15(50)	14(46.67)
	MRSA may be transmitted on hands of health care providers. (Y)	18(60)	15(50)
	Dry Sweeping is recommended twice a day for patients waiting area (N)	15 (50)	12 (40)
	Transferring infection from instruments is procedure dependant (N)	20 (66.66)	17 (56.6)
	Disinfection means removal of microorganism Without sterilization (Y)	21 (70)	20 (66.66)
	Blood soiled stethoscope can be disinfected by using detergent & water (N)	15 (50)	12 (40)
	Gluteraldehyde Provided high level of disinfection (Y)	21 (70)	18 (60)
	Multidrug resistant tubercle bacilli require special disinfection (N)	12 (40)	11 (36.66)

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Table 5: COMPLIANCE OF HCWs WITH HAND WASHING, USE OF GLOVES AND ALCOHOL BASED HAND RUBS*

OCCASION	**HAND WASHING**		**USE OF GLOVES**		**USE OF ABHR***	
	Nurses (N=30) n (%)	**LTs (N=30) n (%)**	**Nurses (N=30) n (%)**	**LTs (N=30) n (%)**	**Nurses (N=30) n (%)**	**LTs (N=30) n (%)**
ALWAYS	24 (80)	20 (66.66)	23 (76.66)	24 (80)	4 (13.33)	5 (16.66)
MOST OF THE TIMES	4 (13.33)	7 (23.33)	5 (16.66)	4 (13.33)	3 (10)	4 (13.33)
SOMETIMES	2 (6.66)	3 (10)	2 (6.66)	2 (6.66)	8 (26.66)	8 (26.66)
RARELY	0 (0)	0 (0)	0 (0)	0 (0)	6 (20)	5 (16.66)
NEVER	0 (0)	0(0)	0 (0)	0 (0)	9(30)	8 (26.66)
TOTAL	30 (100)	30 (100)	30 (100)	30 (100)	30 (100)	30 (100)

Table 6: COMPLIANCE OF HCWs WITH USE OF EYE GEARS, OUTER PROTECTIVE GOWNS & CAP AND SEGREGATION OF WASTES.

OCCASION	**USE OF MASKS**		**USE OF EYE GEARS**		**USE OF GOWNS & CAPS**		**WASTE SEGREGATION**	
	Nurses (N=30) n (%)	**LTs (N=30) n (%)**	**Nurses (N=30) n (%)**	**LTs (N=30) n (%)**	**Nurses (N=30) n (%)**	**LTs (N=30) n (%)**	**Nurses (N=30) n (%)**	**LTs (N=30) n (%)**
ALWAYS	18 (60)	15 (50)	14 (46.66)	12 (40)	12 (40)	10 (33.33)	18(60)	20(67.67)
MOST OF THE TIMES	6 (20)	5 (16.66)	6 (20)	5 (16.66)	4 (13.33)	11 (36.66)	09(30)	09(30)
SOMETIMES	5 (16.66)	7 (23.33)	7 (23.33)	8 (26.66)	6 (20)	1 (3.33)	03(10)	01(3.33)
RARELY	1 (3.33)	3 (10)	2 (6.66)	2 (6.66)	5 (16.66)	3 (10)	0 (0)	0 (0)
NEVER	0 (0)	0 (0)	1 (3.33)	3 (10)	3 (10)	5 (16.66)	0 (0)	0(0)
TOTAL	30 (100)	30 (100)	30 (100)	30 (100)	30 (100)	10 (33.33)	30 (100)	30 (100)

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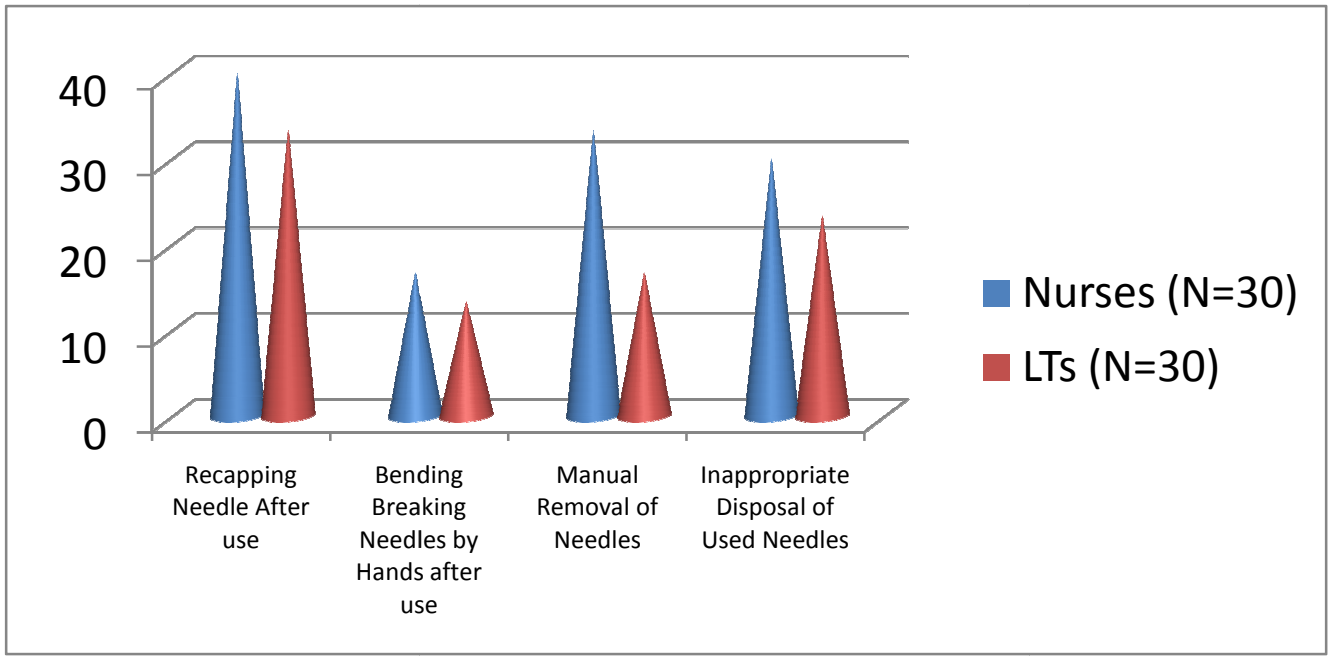
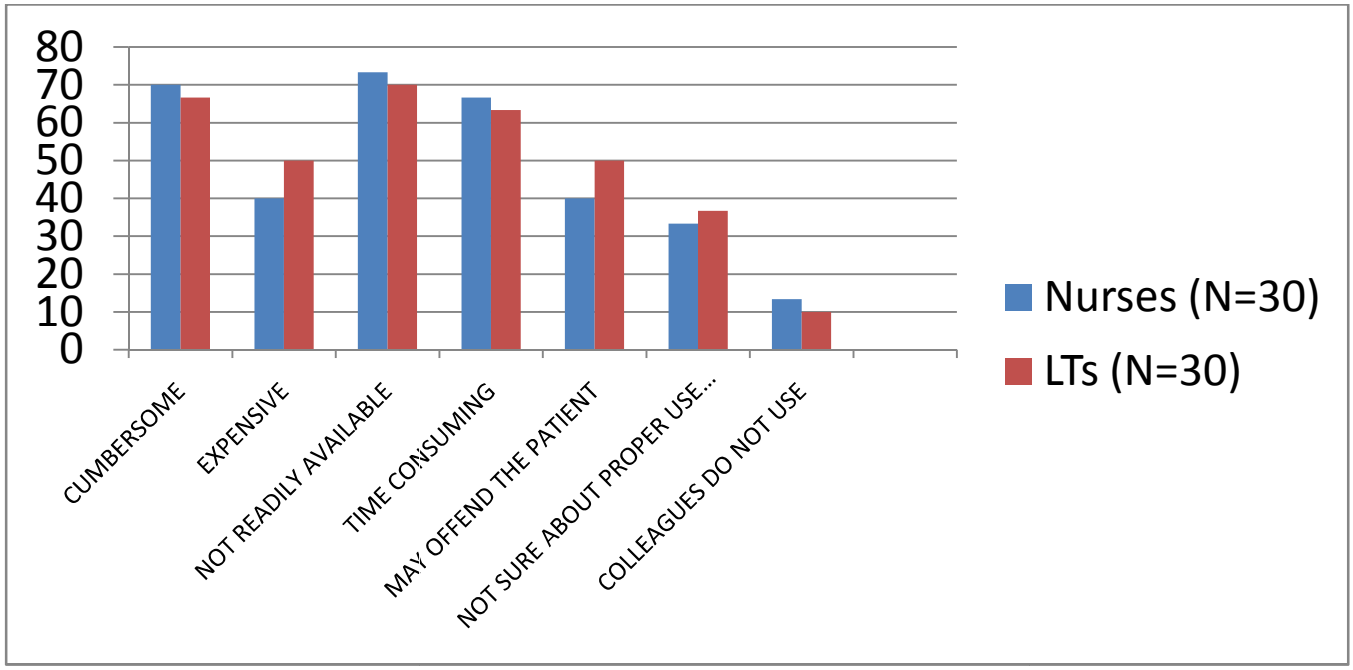
Graph 1: HAZARDOUS NEEDLE PRACTICES AMONG VARIOUS HCWs



Graph 2: PERCEIVED BARRIERS / CHALLENGES PREVENTING COMPLIANCE WITH PPE IN VARIOUS HCWs



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References:

1. Omiepirisa YB. Universal Precautions: A Review. The Nigerian Health Journal, 2012 vol 12 (3) july-sept: p 68-74.
2. Allegranzi B, Pittet D. Healthcare-associated infection in developing countries: simple solutions to meet complex challenges. Infect Control Hosp Epidemiol; 2007, 28(12):1323–1327. [PubMed:17994510]
3. Allegranzi B, Bagheri Nejad S, Combescure C, Graafmans W, Attar H, Donaldson L and Pittet D. Burden of endemic health careassociated infection in developing countries: systematic review andmeta-analysis. Lancet; 2010,377: 228–241.
4. Suchitra JB and Lakshmi DN. Impact of education on knowledge, attitudes and practices among various categories of health care workers on nosocomial infections. Indian Journal of Medical Microbiology; 2007, 25 (3):181-7
5. World Health Organization Report on the Burden of Endemic Health Care-Associated Infection Worldwide;.2011, WHO: Geneva.
6. Kotwal A and Taneja DK. Health care workers and universal precautions: Perceptions and determinats of non-compliance. Indian J Community Medicine; 2010, vol 35(4) Oct-Dec; p526-28.
7. WE Sadoh, AO Fawole, AE Sadoh, AO Oladimeji, and OS Sotiloye. "Practice of universal precautions among healthcare workers," Journal of theNationalMedical Association; 2006, vol. 98, (5), p. 722–724.
8. CDC recommendations: Universal precautions for prevention of Transmission of HIV and other blood borne infections; 2016 [Last accessed on 2017 Jan]. Available from: http://www.cdc.gov/ncidod/dhqp/bp_universal_precautions.html
9. World Health Organization,Guidelines on Prevention and Control of Hospital Associated Infections. WHO: Geneva;2002a .
10. World Health Organization. Prevention of Hospital-acquired Infections. A Practical Guide. 2nd edn. WHO: Geneva; 2002b.
11. World Health Organization. Practical Guidelines for Infection Control in Health Care FacilitiesWHO:Geneva; 2004.
12. Ogoina D, Kemebradikumo Pondei, Babatunde Adetunji, George Chima, Christian Isichei and Sanusi Gidado. Knowledge, attitude and practice of standard precautions of infection control by hospital workers in two tertiary hospitals in Nigeria.Journal of Infection Prevention; 2015,Vol. 16(1) 16–22 DOI: 10.1177/1757177414558957.
13. T Amin and A Al Wehedy. Healthcare providers' knowledge of standard precautions at the primary healthcare level in Saudi Arabia. Healthcare Infection; 2009,14: 65–72DOI: 10.1071/HI09107

14. Tenna A, Stenehjem EA, Margoles L, Kacha E, Blumberg HM, Kempker RR. Infection control knowledge, attitudes, and practices among healthcare workers in Addis Ababa, Ethiopia. Infection Control & Hospital Epidemiology. 2013 Dec;34(12):1289-96.

15. Sangeetha S, Harshika YK, and Seema P. "Standard Precautions: An Assessment of Awareness among Health Care Personnel in a Teaching Hospital, South India". Journal of Evidence based Medicine and Healthcare; 2015,Volume 2, Issue 6, February 9; Page: 638-644

16. Gebresilassie A, Kumei A, Yemane D. Standard Precautions Practice among Health Care Workers in Public Health Facilities of Mekelle Special Zone, Northern Ethiopia. J Community Med Health Educ; 2014, 4: 286. doi:10.4172/2161 0711.1000286

17. Siegel JD, Rhinehart E, Jackson M, Chiarello L. Healthcare Infection Control Practices Advisory Committee. Guideline for isolation precautions: preventing transmission of infectious agents in healthcare settings. Atlanta: Centers for Disease Control and Prevention; 2007. Available online at: http://www.cdc.gov/ncidod/dhqp/gl_isolation.html

18. Kermode M, Jolley D, Langkham B, Thomas MS, Crofts N. Occupational exposure to blood and risk of bloodborne virus infection among health care workers in rural north Indian health care settings. American journal of infection control; 2005 Feb 1,33(1):34-41.

19. Motamed N, BabaMahmoodi F, Khalilian A, Peykanhertitati M, Nozari M. Knowledge and practices of health care workers and medical students towards standard precautions in hospital in Mazandran Province. East Mediterr Health J; 2006 12: 653–61.

20. Sreedharan J, Muttappillymyail and Venkataramana. Knowledge about standard precautions among university hospital nurses in the United Arab Emirates. East Mediterr Health J; 2011 17:331-4.

21. Ekwere TA, Okafor IP. Hand hygiene knowledge and practices among healthcare providers in a tertiary hospital, south west, Nigeria. International Journal of Infection Control; 2013 Oct 17,9(4).

22. Jain M, Dogra V, Mishra B, Thakur A, Looma PS. Infection control practices among doctors and nurses in a tertiary care hospital. Ann Trop Med Public Health.; 2012 5:29 -33

23. Vaz K, McGrowder D, Lindo.A R, Gordon L, Brown P, Irving R. Knowledge, awareness and compliance with universal precautions among health care workers at the University hospital of the West Indies, Jamaica. Int J Occup Environ Med. ; 2010, Oct 1:171-81.

24. Punia S, Nair S, Shetty RS. Health care workers and standard precautions: perceptions and determinants of compliance in the emergency and trauma triage of a tertiary care hospital in south India. International scholarly research notices. 2014;2014.

25. Yamini, Jain A, Mandelia C, Jayaram S. Perception and practice regarding infection control measures among health care workers in district government hospitals of Mangalore, India. Int J Health Allied Sci [Internet].2012 May [cited 2014 May 5]; 1:68-73.

26. Stein AD, Makarawo TP and Ahmad M.F.R. A survey of doctors‘ and nurses‘ knowledge, attitudes and compliance with infection control guidelines in Birmingham teaching hospitals. J Hosp Infect May; 2003, 54:68–73.

27. Chiang WC, Wang HC, Chen SY, Chen LM, Yao YC, Wu GH, Ko PC, Yang CW, Tsai MT, Hsai CC, Su CP. Lack of compliance with basic infection control measures during cardiopulmonary resuscitation—Are we ready for another epidemic?. Resuscitation. 2008 Jun 1;77(3):356-62.

28. Gershon RR, Vlahov D, Felknor SA, Vesley D, Johnson PC, Delcios GL, Murphy LR. Compliance with universal precautions among health care workers at three regional hospitals. American journal of infection control. 1995 Aug 1;23(4):225-36.

29. Muralidhar S, Singh PK, Jain RK, Malhotra M, Bala M. Needle stick injuries among health care workers in a tertiary care hospital of India., Indian Journal of Medical Research; 2010, vol. 131, no. 3, pp. 405–410.

30. Sari SY, Ibrahim K, Haroen H, Afriandi I, Sunjaya DK, Hinduan ZR, Antono SK, Susanto H, Haryani S, Pinxten L, Meheus A. Knowledge, attitude and perceived adherence with universal precautions among health care workers in the obstetrics and gynaecology department of an Indonesian teaching hospital. International Journal of Infection Control; 2011, vol. 7, no. 4.

31. Kumar N, Sharma P, Jain S. Needle stick injuries during fine needle aspiration procedure: frequency, causes and knowledge, attitude and practice of cytopathologist. J Cytol; 2011, Apr 28:49–53.

32. Simard EP, Miller JT, George PA, Wasley A, Alter MJ, Bell BP, Finelli L. Hepatitis B vaccination coverage levels among healthcare workers in the United States, 2002-2003. Infection Control & Hospital Epidemiology.;2007 Jul, 28(7):783-90.