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Original Article

Assessment of Knowledge, Attitude and Practices Pattern of Hand Washing in Some Major Public Sector Hospitals of Pakistan (A Multi-Center Study)

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Abstract

Objectives: To assess knowledge, attitude and practices of hand washing in major Public sector Hospitals of Pakistan and see the differences in practices in different levels of health care workers.

Settings: Cross sectional hospital based survey conducted in all provinces of Pakistan in major tertiary care hospitals.

Subjects and Methods: A Cross sectional hospital based survey was conducted on knowledge, attitude and practices of hand washing in doctors, nurses and paramedical staff. From each hospital 10 OPD's and 10 wards i.e. 2 medical, 2 Surgical, Gynae, Peads, Dermatology, Eye, ENT, and Causality/ICU were selected and from each unit. Four doctors, four nurses and two paramedical staff were interviewed.

Results A total of 3243 respondents were interviewed. Of these 87.3% had knowledge of hand washing. Hand washing facilities were available at 75% places and 69% respondents practiced hand hygiene, but only 58.8% washed their hands for more than 20 seconds. Majority used antibacterial soap bought by them. Rush of the patients, shortage of time, non availability of soap and water and lack of encouragement by seniors were the major causes for low hand hygiene practice.

Conclusions: Almost 25% sites in major public sector tertiary hospitals did not have hand washing facilities but where available most health care providers were using them.

Policy message: Majority despite having knowledge, need motivation and continuous education of hand hygiene. Facilities of hand hygiene should be made available.

Key words: Hand hygiene, hand washing, infection control.

Introduction

Proper hand washing or use of antiseptic after each examination of a patient is an important measure in infection control in the hospitals[1]. About 150 years ago, Dr. Semmelweis, demonstrated that hand washing prevents disease spread and reduces hospital-acquired infections by 50% and can thus save precious resources[2,3]. According to a US study, viruses and bacteria spreading from hospitals infect about 2 million patients each year and kill about 90 000 patients[4]. One study showed that health care workers wash their hands for an average of only 8.5 to 9.5 seconds whereas, a minimum of 10 seconds is recommended[5].

In developed countries, health care associated infection is estimated in 10% of patients whereas, in developing countries it is estimated to occur in 25% of patients[6]. Improving hand hygiene practices and creating awareness along with change in attitude of health workers shall not only reduce hospital-acquired infections but also save resources[5]. Pakistan, due to limited financial resources, shortage of beds and doctors (1592 persons per bed and one doctor for 1183 persons), cannot afford to exhaust its limited resources on hospital-acquired infections[7]. In Pakistan, infection control practices are not followed at most public sector hospitals and there is a need to establish an infection control programme[6]. A previous study done in some major public sector hospitals of Karachi, in 2005-2006 showed that in most hospitals, basic facilities for hand washing were not available and therefore, doctors and paramedics were not washing hands after most of the examinations and they were reluctant to practice it due to many reasons[8]. The hospital management also has to take urgent steps in providing hand-washing facilities at most sites where patients are being examined.

This study was done across Pakistan in most tertiary care public sector hospitals to see the knowledge, attitude and practice pattern of medical and support staff about hand washing and the infrastructure available for hand washing in these facilities.

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Subjects and Methods

A Cross sectional hospital based survey conducted in major public sector hospitals of Faisalabad, Lahore, Quetta, Islamabad Multan, Jamshoro/Hyderabad and Peshawar (Data from Karachi has already been published[8], therefore it was excluded). The sample size was three thousand two hundred forty three (3243) using EPI Info formula with prevalence of 25% and 95% confidence interval with margin of error 5% (289+29 =318 for each center). From each hospital, 10 OPD's and 10 wards were selected as Medical (two units), Surgical (two units), Pediatrics, Gynecology, ENT, Dermatology, Ophthalmology, Causality and Emergency. The Data was collected from four doctors (two senior and two junior), four nurses (one staff nurse or In-charge nurse, two nurses and one junior/student nurse) and two paramedical staff, dispenser and the dresser/technician. A pre coded, pre tested questionnaire was used to collect information through interviews. In addition, observational audit were also done to assess the actual practice pattern of the staff. The project was approved by the ethical review Board of Dow University of Health Sciences, Karachi. A written consent from the Director/Medical Superintendent of each hospital was obtained before starting the study. Similarly, before interviewing each respondent, a written consent was also obtained.

Cross sectional Convenient sampling technique was used. As it is a descriptive evaluating study, most of the results had been expressed in percentages only. However, data were analyzed for comparing the variables between doctors and nurses and paramedical staff and chi-square test was applied to see any statistical significant difference.

Results

Data was collected from 3243 respondents which included doctors, nurses and paramedical staff. Out of the total, data was collected from 1718(53.0%) health care providers from Province of Punjab, 596(18.4%) from Khyber Pakhtoon Khowah, 342(10.5%) from Baluchistan, 298(9.2%) from Sindh and 289(8.9%) from Federal Capital, Islamabad.

Out of 3243 respondents, 707(21.8%) were senior doctors, 801(24.7%) were junior doctors, 539(16.6%) were staff nurses, 270(8.3%) were duty nurses, 375(11.6%) were junior nurses and 551 (17%) were paramedical staff. Data was collected from 1441 persons from OPD as compared to 1802 from wards as there were less nurses and paramedical staff posted in OPD's.

Knowledge about hand washing and organisms being transferred from one patient to another in the hospital due to poor hygiene of the patient was known in majority (94.2%) of the respondents. This response when compared between doctors, nurses and paramedical staff showed that doctors had significantly less (p<0.002) knowledge than the supportive staff (nurses and paramedical staff)

The disease transmission through health care workers was known by 86.2% respondents and out of

these 56.2% respondents knew that hands of health care workers were the most common vehicle of transmission.

Similarly knowledge about transfer of pathogens from patient to patient in hospital environment through common utensils/equipment was known by 91.2% respondents. For these parameters, the knowledge of supportive staff (nurses and paramedical staff) was significantly better as compared to the knowledge of doctors (p<0.000).

Common drinking water as source of disease spread from one patient to another was known to 81.3% respondents with no difference between knowledge of doctors and paramedical staff. Air as source of disease transfer was known in 77.2% with significant difference (p<0.024) in doctor's knowledge v/s knowledge of other health care staff (nurses and paramedical staff)

Knowledge about organisms commonly spreading infection through airborne transmission was most commonly reported to be tuberculosis, followed by viruses, influenza, flu etc. In response to what are the other means of transmission, most of them said bed sheets, water, blood transfusion, food and others (Table-1a).

Almost 97.0% of doctors and other health care staff knew that hospital organisms can cause pneumonia, sepsis urinary tract infection or surgical site infection in hospitalized patients who were admitted for some other reasons. They also knew that hand washing can reduce transmission of organisms during examinations of patients (99.3%). Similarly almost all the doctors and health care staff (98.0%) knew that hand washing reduces the incidence of hospital acquired infection in admitted patients. There was no difference in this information when compared within various cadres of health providers.

By reducing hospital infection, the cost of hospitalization will decrease and bed availability will increase was affirmed by 95.2% and 93.6% respectively.

Only 722(22.3%) respondent said that hand hygiene can only be the single most effective measure in controlling an outbreak of resistant bacteria in the hospital. This information was found better in other health care staff (nurses and paramedical staff) as compared to doctors. (Table-1b)

Over all knowledge of doctors, nurses and paramedical staff assessed was 87.3%. There was no significant difference in knowledge of doctors v/s nurses and paramedical staff.

Table 1a: Knowledge of doctors, nurses, paramedical staff about hand hygiene.

	Total respondents n=3243 (100.0%)	*Doctors n=1508 (100.0%)*	*Nurses n=1184 (100.0%)*	*Para-medical staff n=551 (100.0%)*	*p-value significant @0.05*
How are organisms transferred from patient to patient in the hospital environment					
a)Patient themselves due to poor hygiene	3056 (94.2%)	1435 (95.2%)	1119 (94.5%)	502 (91.1%)	0.002
b) Through the health care workers	2797 (86.2%)	1262 (83.7%)	1059 (89.4%)	476 (86.4%)	0.000
c) If yes, are hands of the health care workers most common vehicle of transmission.	1822 (56.2%)	777 (51.5%)	699 (59.0%)	346 (62.8%)	0.000
d) From common utensils/equipment	2958 (91.2%)	1329 (88.1%)	1109 (93.7%)	520 (94.4%)	0.000
e) From common source e.g. drinking water	2637 (81.3%)	1239 (82.2%)	952 (80.4%)	446 (80.9%)	-
f) From the air	2503 (77.2%)	1182 (78.4%)	919 (77.6%)	402 (73.0%)	0.024

Table 1b: Knowledge of doctors, nurses, paramedical staff about hand hygiene.

	Total respondents n=3243 (100.0%)	*Doctors n=1508 (100.0%)*	*Nurses n=1184 (100.0%)*	*Para-medical staff n=551 (100.0%)*	*p-value significant @0.05*
Hospital organisms can cause pneumonia, sepsis, urinary tract infection or surgical site infections in patients even if they were admitted for some other reasons?	3145 (97.0%)	1479 (98.1%)	1139 (96.2%)	527 (95.6%)	0.002
Hand washing can reduce transmission of organisms between patients?	3219 (99.3%)	1495 (99.1%)	1177 (99.4%)	547 (99.3%)	-
Hand washing reduce the incidence of hospital acquired infection in admitted patients	3175 (97.9%)	1470(97.5%)	1159 (97.9%)	546 (99.1%)	-
If yes, do you think that reducing hospital infection will:-					
a)Reduce hospital cost	3088 (95.2%)	1452 (96.3%)	1103 (93.2%)	533 (96.7%)	0.000
b)Increase bed availability	3035 (93.6%)	1391 (92.2%)	1121 (94.7%)	523 (94.9%)	0.014
If there is an outbreak of resistant bacteria in the hospital, hand hygiene can only be the single most effective measure in controlling the outbreak?	722 (22.3%)	264 (17.5%)	289 (24.4%)	169 (30.7%)	0.000

When practice of hand hygiene was assessed for doctors and other health care providers (nurses and paramedical staff), it was seen that only 28.9% washed their hands or used alcohol rubs only after examining the serious patients. This practice was significantly high (38.5%) in paramedical staff as compared to doctors (26.3%). About 60.1% respondents washed their hands before seeing a patient where as 66.9% washed hands after seeing every patient (p<0.000). Majority of the respondents (79.9%) washed their hands between tasks on same patient (p<0.000). Similarly, 82.9% doctors and other health care providers also washed their hands after taking off gloves. When inquired about the duration of hand hygiene, only 66.4% respondents said that they wash their hands for more than 20 seconds to 60 seconds. Regarding type of hand hygiene products, 13.4% used only water, 70.0% used soap and water or antibacterial lotion and water and a very small proportion use alcohol rubs (6%) (Table-2).

Regarding attitude of the health care providers, they were asked to give reasons for non compliance to hand washing. Almost 68.3% said it was due to non availability of hand hygiene facilities in the public sector hospitals. Over 57% said that they were unable to wash hands due to time factor while, 77% said it was due to heavy rush of patients. The habits of their seniors or peers were the reason quoted by 38.3% respondents. Among those that gave suggestions, the common was provision of hand washing facilities for 24 hours along with awareness in the staff, through conducting workshops and through use of electronic and print media campaigns. They also suggested that ratio of doctors and supportive staff should be increased (Table-3).

The data was also analyzed regarding facilities of hand washing at different places of hospital i.e. wards, ICU, OPD and causality. Overall at 95.5% places, sink was available. However, sink was mostly available in

Table 2: Practicing pattern.

	Total respondents n=3243 (100.0%)	*Doctors n=1508 (100.0%)*	*Nurses n=1184 (100.0%)*	*Para-medical staff n=551 (100.0%)*	*p-value significant @0.05*
When should you practice hand hygiene(wash or rub)					
a)Only after examining serious patients	937 (28.9%)	396 (26.3%)	329 (27.8%)	212 (38.5%)	0.000
if no	1949 (60.1%)	948 (62.9%)	726 (61.3%)	275 (49.9%)	0.000
i) Before seeing each patient					
ii) After every patient	2169 (66.9%)	1056 (70.0%)	803 (67.8%)	310 (56.3%)	0.000
b)Between task on same patient such as if you change dressing of Patient and then place IV canola	2590 (79.9%)	1258 (83.4%)	934 (78.9%)	398 (72.2%)	0.000
c)After taking off gloves	2687 (82.9%)	1237 (82.0%)	994 (84.0%)	456 (82.8%)	-
What should be the duration of hand hygiene?					
i) 10 seconds	152 (4.6%)	83 (5.5%)	56 (4.7%)	13 (2.4%)	0.018
ii) 11-20 seconds	939 (29.0%)	414 (27.5%)	348 (29.4%)	177 (32.1%)	
iii) 21-60 seconds	2152 (66.4%)	1011 (67.0%)	780 (65.9%)	361 (65.5%)	
What type of hand hygiene product do you use?					
i) Water only	434 (13.4%)	208 (13.8%)	124 (10.5%)	102 (18.5%)	0.000
ii) Beauty soap and water	1338 (41.3%)	584 (38.7%)	535 (45.2%)	219 (39.7%)	0.002
iii) Antibacterial soap and water	2270 (70.0%)	1038 (68.8%)	832 (70.3%)	400 (72.6%)	-
iv) Antibacterial solution and water	726 (22.4%)	400 (26.5%)	236 (19.9%)	90 (16.3%)	0.000
v) Alcohol rubs	196 (6.0%)	114 (7.6%)	59 (5.0%)	23 (4.2%)	0.002

Table 3: Attitude of doctors and paramedical staff regarding hand hygiene.

	Total respondents n=3243 (100.0%)	*Doctors n=1508 (100.0%)*	*Nurses n=1184 (100.0%)*	*Para-medical staff n=551 (100.0%)*	*p-value significant @0.05*
What are the limitations for full compliance?					
i) Non availability of hand hygiene facilities	2215 (68.3%)	1074 (71.2%)	786 (66.4%)	355 (64.4%)	0.003
ii) No time for hand hygiene	1862 (57.4%)	770 (51.1%)	758 (64.0%)	334 (60.6%)	0.000
iii) Low staff patients ratio	2493 (76.9%)	1120 (74.3%)	948 (80.1%)	425 (77.1%)	0.002
iv) Not encouraged by seniors or peers	1242 (38.3%)	501 (33.2%)	492 (41.6%)	249 (45.2%)	0.000
v) Poor quality of soap provided by administration	1696 (52.3%)	831 (55.1%)	612 (51.7%)	253 (45.9%)	0.001
vi) Poor quality of alcohol rubs provided by administration	844 (26.0%)	430 (28.5%)	289 (24.4%)	125 (22.7%)	0.008
vii) Skin irritation	582 (17.9%)	292 (19.4%)	224 (18.9%)	66 (12.0%)	0.000
viii) Allergy to product	459 (14.2%)	241 (16.0%)	174 (14.7%)	44 (8.0%)	0.000

ICU (98.3%) as compared to casualty (87.3%). Sink was clean at only 47% places mostly in the ICU (57.1%) and relatively less at Casualty (30.2%). Similarly all other facilities like availability of water, soap, towel and alcohol rub were more at ICU than in the wards and least in casualty (Table-4).

It was observed that only 69.3% respondents were practicing hand hygiene and only 58.9% washed hands for more than 20 seconds. Overall at 95.5% places, sink was available for hand washing but at only 47% places, it was clean and dry. The sink was clean and dry at 50% doctor's places and at 39.4% paramedical staff places. (p<0.000). Similarly running water was available at 75.4% places and soap at 74% places. Shortage of towel was also found at all places. At 27.3% places towel was present and at only 7.6% places it was used singly and this was mostly seen at doctors places (12.7%) whereas, for paramedical staff it was found at only 3.l% (p<0.000). At 13.5% places the towel was neat and clean. Alcohol rub was available at 20% places and mostly at ICU i.e. 33.1%. Filled alcohol dispenser was seen at 7.5% places (Table 5).

Knowledge, practice and attitude of the respondents were compared within the provinces and Federal Capital Islamabad. Majority of the respondents of the four provinces and Federal Capital Islamabad knew about all the ways, the bacteria's can be transmitted from patient to patient and through health care workers. However, both these issues were known significantly higher in the respondents from Baluchistan and comparatively less in respondents from Federal Capital Area. The knowledge about hands of health care workers as being the most common vehicle of transmission of disease was lowest for Khyber Pakhtoon Khowah (52.3%) and highest (94.7%) from Baluchistan (p<0.000). Common drinking water and air as a source of disease transmission was known by almost all the respondents of Sindh and Baluchistan.

Table 4: Assessment of facilities for hand washing at different wards /OPD/ICU/casuality.

	Total n=3243 (100.0%)	*Wards n=1629 (100.0%)*	*ICU n=175 (100.0%)*	*OPD n=1250 (100.0%)*	*Causality n=189 (100.0%)*	*p-value significant @0.05*
i) sink available	3111 (95.9%)	1574 (96.6%)	172 (98.3%)	1200 (96.0%)	165 (87.3%)	0.000
ii) Sink found clean and dry	1520 (46.9%)	736 (42.2%)	100 (57.1%)	627 (50.2%)	57 (30.2%)	0.000
iii) Water available in tap	2446 (75.4%)	1234 (75.8%)	141 (80.6%)	930 (74.4%)	141(74.6%)	-
iv) Soap available on sink	2400 (74.0%)	1215 (74.6%)	141 (80.6%)	921 (73.7%)	123(65.1%)	0.007
v) Soap dry	786 (24.2%)	372 (22.8%)	61 (34.9%)	309 (24.7%)	44 (23.3%)	0.005
vi) Towel available	884 (27.3%)	437 (26.8%)	44 (25.1%)	368 (29.4%)	35 (18.5%)	0.013
vii) Towel found to be used by single person	247 (7.6%)	103 (6.3%)	17 (9.7%)	115 (9.2%)	12 (6.3%)	0.020
viii) Towel found in clean condition	439 (13.5%)	219 (13.4%)	19 (10.9%)	185 (14.8%)	16 (8.5%)	-
ix) Alcohol rub available at point of patients care	649 (20.0%)	307 (18.8%)	58 (33.1%)	255 (20.4%)	29 (15.3%)	0.000
x) Dispenser found filled	244 (7.5%)	111 (6.8%)	37 (21.1%)	91 (7.3%)	5 (2.6%)	0.000
xi) Dispenser found in working condition	357 (11.0%)	165 (10.1%)	34 (19.4%)	151 (12.1%)	7 (3.7%)	0.000

Table 5: Observation.

	Total respondents n=3243 (100.0%)	*Doctors n=1508 (100.0%)*	*Nurses n=1184 (100.0%)*	*Para-medical staff n=551 (100.0%)*	*p-value significant @0.05*
Hand Hygiene done	2249 (69.3%)	1044 (69.2%)	833 (70.4%)	372 (67.5%)	-
Time of hand Hygiene was >20 seconds	1909 (58.9%)	900 (59.7%)	707 (59.7%)	302 (54.8%)	-
What type of hand washing facilities available					
i) sink available	3111 (95.5%)	1437 (95.3%)	1147(96.9%)	527 (95.6%)	----
ii) Sink found clean and dry	1520 (46.9%)	761 (50.5%)	542 (45.8%)	217 (39.4%)	0.000
iii) Water available in tap	2446 (75.4%)	1106 (73.3%)	906 (76.5%)	434 (78.8%)	0.022
iv) Soap available on sink	2400 (74.0%)	1098 (72.8%)	888 (75%)	414 (75.1%)	-
v) Soap dry	786 (24.2%)	438 (29.0%)	248 (20.9%)	100 (18.1%)	0.000
vi) Towel available	884 (27.3%)	484 (32.1%)	264 (22.3%)	136 (24.7%)	0.000
vii) Towel found to be used by single person	247 (7.6%)	191 (12.7%)	37 (3.1%)	19 (3.4%)	0.000
viii) Towel found in clean condition	439 (13.5%)	242 (16.0%)	140 (11.8%)	57 (10.3%)	0.000
ix) Alcohol rub available at point of patients care	649 (20.0%)	299 (19.8%)	225 (19.0%)	125 (22.7%)	-
x) Dispenser found filled	244 (7.5%)	117 (7.8%)	88 (7.4%)	39 (7.1%)	-
xi) Dispenser found in working condition	357 (11.0%)	147 (9.7%)	139 (11.7%)	71 (12.9%)	-

Almost all the health care workers of all four provinces and Federal capital Islamabad knew that hospital organisms can cause pneumonia, sepsis, urinary tract infection, and surgical site infection in hospitalized patients. They also knew that hand washing can reduce transmission of organisms in admitted patients and by this; the cost of hospitalization can be decreased and bed availability increased. However, the respondents from Baluchistan did not agree (0.6%) and respondents from Sindh were less agreed (14.8%) that hand hygiene can only be the single most effective measure in controlling an out break of resistant bacteria in hospital.

Only 69% respondents from Sindh practiced hand washing after examining serious patients, whereas, this practice was observed by 100% respondents from Balochistan ($p<0.000$). Similarly almost all the respondents from Baluchistan washed hands from 21-60 seconds whereas, from Sindh and Federal Capital this practice was around 45% ($p<0.05$). Majority of respondents from Sindh and Baluchistan (93-99%) used antibacterial soap as against only 38% from the Federal Capital.

The attitude of the respondents of all the four provinces and federal capital was positive. However, they demanded better quality of hand hygiene products and better hand washing facilities. This attitude was found significantly higher in respondents from Baluchistan as compared to other three provinces as well as the Federal Capital.

Discussion

Hand hygiene is the most important step to prevent the transfer of microorganism in the hospital settings. However, availability of basic facilities of hand hygiene near to the health care of workers duty place is essential. In an earlier study, only 16.8% doctors, nurses and paramedical staff said that hand-washing facilities are available at their place of duty[8]. While this figure rose to 31.7% in the present study. Another study showed that accessibility to wash basin does not improve the compliance of hand washing[9]. In Pakistan where a mixed trend of public and private hospitals are providing health facilities to the general public a vast difference in health hygiene could be seen. In some studies, in the private hospitals where administrative support for the hand-washing program was significantly greater, hand washing compliance was significantly higher[10-13]. The present study showed that basic facilities for hand washing were still not available at 25% major public sector hospitals of Pakistan, therefore, even those who have knowledge about the importance of the hand washing are unable to practice it.

In another study, electronic monitoring and voice prompts improved hand washing and decreased nosocomial infection[11]. In our study, it was mentioned by the respondents that if proper hand washing facilities were provided at public sector hospitals, a better result could be obtained.

According to a study, there was no significant difference in hospital staff in any phase of the study in hand washing practices. However, constant motivation through movies, brochures, and posters, transiently increased the frequency of hand washing among the house staff of a tertiary care facility[14]. A study from Canada reported that nurses adjusted their hand washing rates according to the risk level of each visit[15]. An Australian study showed an increase in hand washing from12.4% to 54.6% after induction of written advice for five weeks[16]. In our study it was suggested by the respondents that motivation through media, conferences, and posters could help to change the situation. The present study showed that though 80% staff said that they were practicing hand washing but actually only 69% were doing so but this figure is much encouraging when compared to 8.9% reported earlier[8]. It shows a great change in the attitude and practicing pattern of the doctors, nurses and paramedical staff. Comparing our results with the Indian study, a lapse in hand washing was observed in 41% cases and they concluded that nothing other than an individual's commitment is likely to prevent hospital acquired infection[17].

To reduce nosocomial infection, hand washing practices in health care providers need to be emphasized along with provision of facilities. Water filters and hand washing detergents may be installed at all places where patients are examined. Apart from the hospital administration drug companies and philanthropic support can be used to install and maintain these facilities.

It is suggested that such type of study should be done at a large scale in all public sector and some private sector dispensaries of the Sindh Province especially in rural areas, to see if difference exists between rural and urban behavior and between public and private sector.

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