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HAND HYGIENE PRACTICES IN JUNIOR DOCTORS AND NURSES OF LAHORE GENERAL HOSPITAL

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Abstract:

Introduction: *Hand hygiene is the most important health-care associated factor considered in the prevention of hospital acquired infections. Hand hygiene is the act of cleaning hands for the purpose of decontamination of microorganisms and chemicals.*

Study Design: *The cross-sectional observational study was conducted to examine the hand hygiene practices in junior doctors and nurses of Lahore General Hospital.*

Study Duration: *The study was conducted from 11th April 2018 to 3oth May 2018.*

Objectives: *To determine the hand hygiene practices among junior doctors and nurses; to corelate number of patients visiting OPD with number of times doctor/nurses practiced hand hygiene. The objectives also included comparison between different disinfecting methods in relation to doctor's precedence for disinfection and to determine any factors that affect the compliance.*

Methods: *Cross-sectional study was conducted on 100 doctors and nurses from April 11th to May 30th 2018 at LGH. Structured questionnaire based on WHO concept of 'Five Moments of Hand Hygiene' was used to evaluate the knowledge and compliance for hand hygiene.*

Results: *The analysis of study revealed 45% doctors/nurses has received formal training in hand hygiene while 55% of doctors and nurses hasnot received the training in last 3 years. Most of the doctors and nurses use alcohol-based hand rub for hand hygiene after seeing every patient and many of doctors and nurses neglect hand hygiene practice as it is inconvenient and time taking procedure.*

Conclusion: *From the findings,it is concluded that most of the doctors and nurses neglect hand hygiene practice as they lack training and complete knowledge of hand hygiene which is an important factor in prevention of hospital acquired infections.*

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INTRODUCTION:

Effective hand hygiene is the single most important strategy in preventing healthcare associated infections. Hand hygiene is a general term applying to the use of soap/solution (non-antimicrobial or antimicrobial) and water, or a waterless antimicrobial agent to the surface of the hands.(14)

The majority of studies on hand hygiene practices have described that compliance with hand washing recommendation is low. Alcohol-based hand rub provide several advantages over handwashing with soap and water. Hand hygiene is not observed frequently due to large number of patient contacts, simultaneous management of multiple patients, high illness acuity and several have constraints. Moreover, poor compliance factors included overcrowding, understaffing and lack of active participation in hand hygiene promotion.

The significance of hand washing in patient care was conceptualized in the early 19th century. Labarraque provided the first evidence that hand decontamination can markedly reduce the incidence of puerperal fever and maternal mortality. (15)

It has been observed that compliance with hand washing recommendations was low in emergency department in United States. Nurses washed their hands significantly more often than either staff physicians or resident physicians, but the average hand-washing duration was less than recommended for all groups. Reasons being large number of patient contacts, simultaneous management of multiple patients, high illness acuity, and severe time constraints. (16)

This study aims to identify various methods and frequency of hand hygiene practices among young doctors and nurses to establish degree of association between it and resultant desired prevention. This study aims to increase compliance with hand washing among junior doctors and nurses.

LITERATURE REVIEW:

By far the most frequent complications affecting hospitalized patients are Nosocomial, or hospital-acquired, infections (more appropriately called health care–associated infections).(1)

The most common vehicle for transmission of healthcare associated pathogens from one patient to another and within the healthcare environment is the Healthcare workers hands. It is believed thatoptimal hand hygiene behavior is the cornerstone of healthcare-associated infection (HCAI) prevention.(2)

Thus, teaching adequate knowledge and good attitudes and practices of the healthcare workers regarding hand hygiene in their primary training is very important.(3)

Many studies have been done to access the knowledge of healthcare workers. A study conducted by WaiKhuan Ng,Ramon Z. Shaban, and Thea van de Mortel in UAE found nurses hand hygiene knowledge was slightly lower than that of doctors' (73.5% versus 78.5%).(4)In a study conducted in Iran, the importance of the multimodal training program regarding hand hygiene knowledge is highlighted. All study groups had an average knowledge of HH. The score of 21% was ≤ 50% (poor) and only 10.6% had a good knowledge score (i.e. the score ≥75%). The participants who had received formal training in HH and those who had not, showed no significant difference in their level of knowledge about hand hygiene.(5)

A couple of studies represent the inadequateness of the hand hygiene practices of the healthcare workers. In a study done by Qasmi SA et al, Self-reported HH compliance was found to be low (56.8%), and moderate HH knowledge (61.8%) was observed among all study respondents.(6)

It has been observed that compliance with hand washing recommendations was low in emergency department in United States. Nurses washed their hands significantly more often than either staff physicians or resident physicians, but the average hand-washing duration was less than recommended for all groups. Poor compliance in the emergency department may be due to the large number of patient contacts, simultaneous management of multiple patients, high illness acuity, and severe time constraints.(7)

In comparative study of hand hygiene and alcohol-based hand rub use among Irish nursing and medical students. It was observed that hand hygiene compliance was highest after body fluid exposure (99.5% NS, 91% MS) and lowest after touching a patient's surroundings (61.5% NS, 57.5% MS) Attitudes towards hand rubbing were largely positive in both disciplines. 16% of NS were not aware of the clinical contraindications to ABHR use, compared to 45% of MS. 9% of NS did not know when to use soap and water and when to use ABHR, compared to 36% of MS. In contrast, more medical students (46%) than nursing students

(22%) were routinely using alcohol-based hand rub for decontamination of hands as recommended.(8)The hand hygiene knowledge scores suggest further hand hygiene education is required, especially on alcohol-based hand rub use.(4)

Another study on HCWs in UK shows that compliance was 47% for doctors, 75% for nurses, 78% for allied health professionals, and 59% for ancillary and other staff (P<0.001).Hand hygiene compliance varied depending on which of the five moments of hygiene HCWs had undertaken (P<0.001), with compliance before an aseptic task being 100% (3/3); after body fluid exposure 93% (86/93); after patient contact 80% (114/142); before patient contact 68% (196/290); and after contact with surroundings 50% (65/129). Lower levels of compliance were found for HCWs working during the early shift (P<0.001).(9)

Researches in United States indicate that hands were washed when needed before an interaction in 27%, during an interaction in 0% and after an interaction in 63%. Gloves were worn in 82% interactions where indicated and changed appropriately in 16% of the interactions. Attempts to improve compliance, e.g., by in-service education, distribution of leaflets, lectures, automated dispensers and feedback on handwashing rates have been associated at best with transient improvement.(10)

A research was done on the effectiveness of interventions aimed at increasing handwashing in healthcare workers, the results showed that educational interventions have a very poor influence on handwashing behavior. Instead, the use of strategically designed reminders or using the help of patients to remind staff of the need to conduct handwashing can have a more sustained effect. Feedback of performance can increase levels of handwashing and can maintainpositive effect but if feedback is not repeated regularly, then this effect is not maintained over long period of time.(11)A mixture of administrative support, 'supplies', education and training, reminders, surveillance, and performance feedback also helped a lot in raising the compliance from a baseline of 51.5% to a record 80.1%; regardless of this improvement, no set of intervention(s) could help reach the desired near-100% level.(12)

To find out the impact of a hand hygiene audit on hand hygiene compliance in a tertiary care public sector teaching hospital in South India. A study was carried out, in which HH audit was done in October 2015-September 2016 and HH complete adherence rate (HHCAR) and HH partial adherence rate were analyzed. The HHCAR, HH partial adherence rate, and nonadherence rate were found to be 45.5%, 21.17%, and 33.3%, respectively. There was gradual statistically significant increase in monthly HHCAR during the study period from 37.5%-51.7% (P = .001). World Health Organization Moments 3 and 4 had statistically significant compliance (78.5% and 71.8%, respectively; P < .001) compared with Moments 1, 2, and 5. This shows the influence of

HH audit on the HH compliance and that the compliance with HH practice by doctors and with the World Health Organization "before" Moments, especially, should be given more importance.(13)

AIMS AND OBJECTIVES

1) To determine the hand hygiene practices among junior doctors and nurses.
2) To correlate number of patients visiting OPD with number of times a doctor/nurse practised hand hygiene
3) To compare different disinfection methods in relation to doctor's precedence for disinfection
4) To determine any factors that affect doctor's/nurses hand hygiene compliance

OPERATIONAL DEFINITION

Hand hygiene is defined as any method that removes or destroys microorganisms present on the hands.

Hand hygiene programs should include clear guidance on procedures for the removal of common pathogens from the hands of passengers and crew members. Included in this program should be detailed instructions on when, where, why and the "how to's" of proper hand hygiene, including the use of soap and water & effective use of antiseptic hand washes and hand rubs/sanitizers.

Substances used for hand hygiene

Different substances can be used for cleaning hands like warm water, soap & water, alcohol rubs etc.

Hot water that is comfortable for washing hands is not hot enough to kill bacteria.

Soap and water is used when visibly dirty or contaminated with proteinaceous material, or visibly soiled with blood or other body fluids, or if exposure to potential spore forming organisms is strongly suspected or proven, or after using the

bathroom. **Alcohol-based hand rub** is used for all clinical situations where hands are visibly clean.

Scoring:
Plain water - Poor
Soap & water - Fair
Alcohol rubs – Excellent

Five moments for hand hygiene
The newly developed Five Moments for Hand Hygiene has emerged from the WHO Guidelines on Hand Hygiene in Health Care. It defines the key moments for hand hygiene. They are as follows:

1. Before touching a patient.
2. Before clean / aseptic procedure.
3. After body fluid exposure risk.
4. After touching a patient.
5. After touching patient surroundings.

Scoring:
According to number of points followed
1 – 2 Poor
3 Fair
4 – 5 Excellent

METHODOLOGY:

1) **Study Design**
The cross-sectional observational study design was used to examine hand hygiene practices among junior doctors and nurses of Lahore General Hospital.
2) **Study Setting**
The study was conducted among House Officers and nurses of Lahore General Hospital.
3) **Study Duration**
The study was conducted from 11th April 2018 to 30th May 2018.
4) **Sample Size**

N= z^2 p(1-p)/ d^2

Where n= size of sample taken
p= proportion of study population
d= margin of error
z= probability 95%

Now if we consider that;
Proportion of study population **(p)** (as per our parent article) = 0.5
Margin of error **(d)** is 5% or taken as 0.07%
Probability **(z)** is 95% = 0.05 =1.96

Putting values in Equation:

$$= \frac{(1.96)^2 \times 0.5 \times (1-0.5)}{(0.07)^2}$$

$$= 3.8416 \times 0.5 \times 0.5$$

$$= \frac{0.0049}{{}_{0}{}^{0}{}_{.0049}{}^{.96}} = 196$$

Rationale: Due to unavailability of the junior doctors and nurses, data was reduced to 100 sample size.

Data Analysis Plan
First the data were checked for completeness and consistency.

Analysis was carried through the SSPS statistical package. The results were obtained using cross tables and pie charts. Independent samples and Anova was applied to confirm whether the difference is significant or not.

ETHICAL CONSIDERATIONS

- **Informed consent**- Each potential interviewee will be given full explanation regarding reason for study, procedure and time required to perform interview and he/she will be given opportunity to opt in or out. He/she will be ensured that this study does not intend to reflect or suggest apprehension for any particular religion, race or ethnicity.

•**Rights of participation**- Every interviewee has right to participate or walk out. No use of tone, compulsion or any other unfair means will be used to collect data.
•**Confidentiality**-Every interviewee will be ensured that the data will not be disclosed.
•**Data anonymity-** Data will stay anonymous during the study time.
The study will be carried out under supervision of principal investigator and an array of field supervision. Any discrepancies or ethical problem which may occur will be addressed by field supervisors.

RESULTS:

The data was collected from 50 doctors and 50 nurses in which half the doctors were female and the other half male and their designation was house officer.

The analysis of study revealed that 45% of the total doctors and nurses have received formal training in hand hygiene in the last 3 years and 47% of the doctors and nurses have the basic knowledge of hand hygiene. This percentage is certainly not satisfactory nor acceptabe. 65% of them use alcohol-based hand-rubs for hand hygiene which is still a very small percentage compared to the ideal percentages in 90s and only 40% perform hand hygiene for 15 seconds which is the bare minimum.

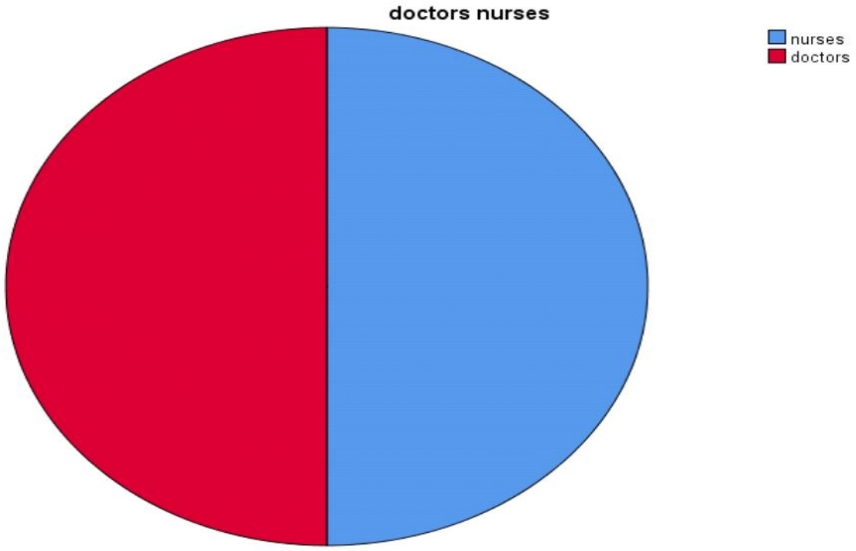
According to WHO, there are few definitive data on the patient-care activities that are most likely to transmit bacteria to health care worker (HCW) hands, but there have been several studies that identified many possibilities. Although bacteria have been found on HCW hands after activities such as wound care, intravascular catheter care, respiratory tract care and handling patient secretions as expected, bacteria also have been found on HCW hands after so-called "clean" contact, such as taking a patient's pulse, temperature or blood pressure.

Hand hygiene contributes significantly to keeping patients safe. It is a simple, low-cost action to prevent the spread of many of the microbes that cause health care-associated infections (HAI). While hand hygiene is not the only measure to counter HAI, compliance with it alone can dramatically enhance patient safety, because there is much scientific evidence showing that microbes causing HAI are most frequently spread between patients on the hands of health-care workers.

In addition, health-care facilities which readily embrace strategies for improving hand hygiene also prove more open to a closer scrutiny of their infection control practices in general. Therefore, the knock-on impact of focusing on hand hygiene can lead to an overall improvement in patient safety across an entire organization.

In developing countries, the impact of HAI is far greater, with the risk being two- to twenty-fold higher than those in the developed world, and prevalence studies report hospital-wide infection rates usually higher than 15%. In those countries, over 4000 children die of HAI every day, equating to a plane crashing every hour. Approximately half of all patients admitted to neonatal intensive care units acquire an infection, and over half of these die.

And with that been said, the common cause of infections in hospital is due to poor hand hygiene, which is a well-known and researched fact yet only 50% of the doctors/nurses perform hand hygiene after seeing every patient. This point is very important to stress because doctors can transfer these germs from one patient to another in addition to infecting themselves. 67% of the doctors and nurses think that damaged skin is associated with increased likelihood of colonization of hands with harmful germs. This percentage is still not ideal. The reasons that health care workers cite as being problematic to practice hand hygiene includes inconvenient to practice (31%), it is time consuming (31%), causes skin irritation (12%) and skin dryness issues (14%). Proper education and awareness regarding these topics should be spread among doctors, nurses and patients. Seminars should be held at intervals in hospitals. Most doctors perform hand hygiene according to 'Five Moments of hand hygiene' by WHO.


doctors nurses
nurses
doctors

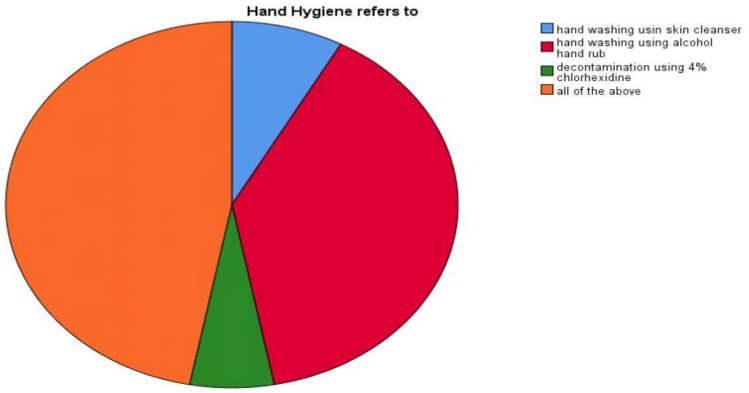

Hand Hygiene refers to
hand washing usin skin cleanser
hand washing using alcohol hand rub
decontamination using 4% chlorhexidine
all of the above

Table 1: Did you receive formal training in hand hygiene in last 3 years

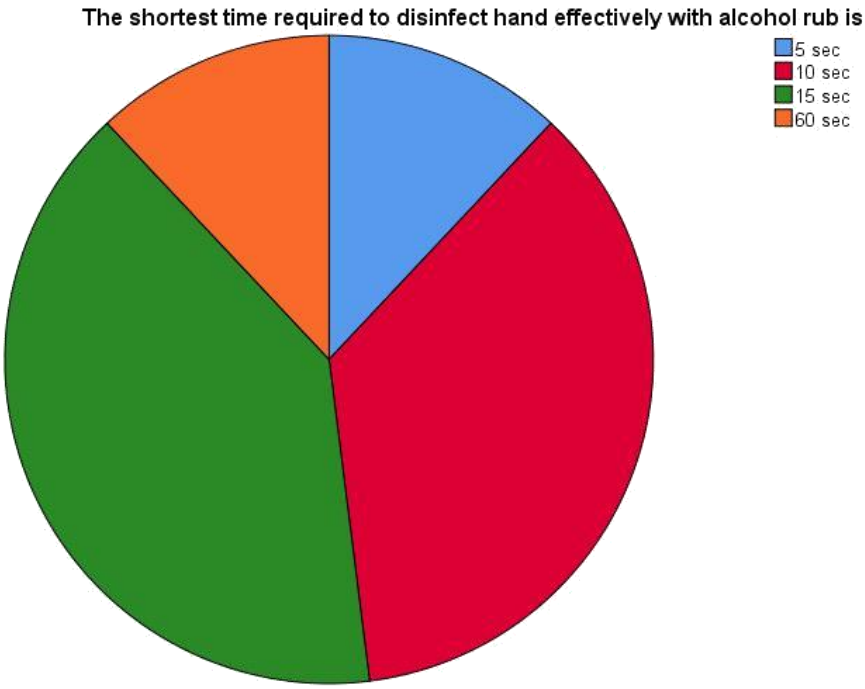
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	45	45.0	45.0	45.0
	No	55	55.0	55.0	100.0
	Total	100	100.0	100.0	

Table 2: Do you routinely use alcohol based hand rub for hand hygiene

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	65	65.0	65.0	65.0
	No	35	35.0	35.0	100.0
	Total	100	100.0	100.0	

Table 3: Which of the following should be avoided as associated with increased likelihood of colonization of hands with harmful germs

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	wearing jewellery	12	12.0	12.0	12.0
	damaged skin	67	67.0	67.0	79.0
	artificial fingernails	17	17.0	17.0	96.0
	regular use of hand cream	4	4.0	4.0	100.0
	Total	100	100.0	100.0	


The shortest time required to disinfect hand effectively with alcohol rub is
5 sec
10 sec
15 sec
60 sec

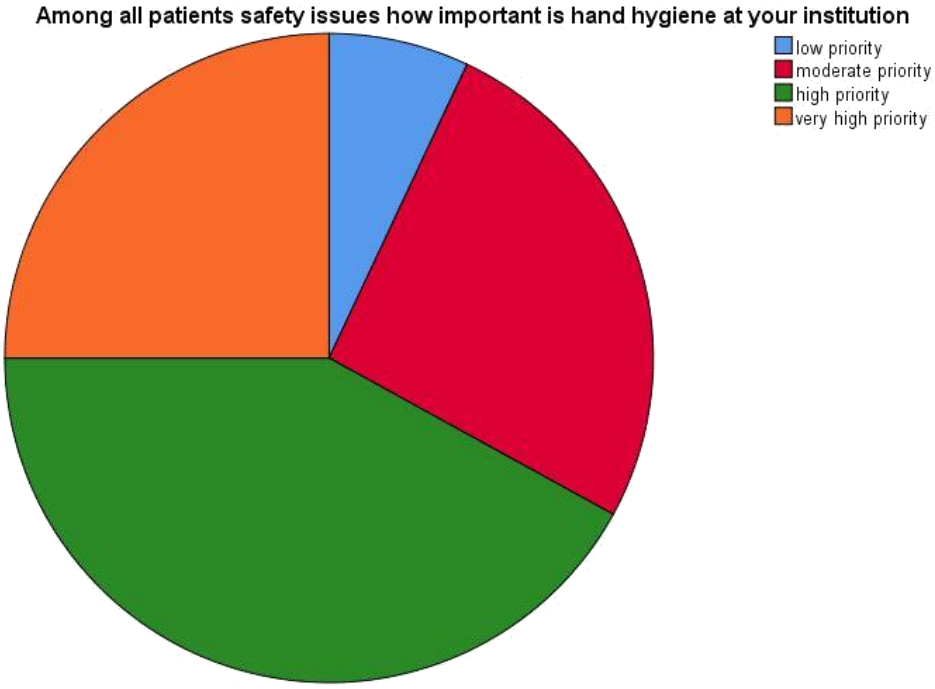

Among all patients safety issues how important is hand hygiene at your institution
low priority
moderate priority
high priority
very high priority

Table 4: How many times a day you practice hand hygiene

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	after seeing every patient	50	50.0	50.0	50.0
	after seeing 2-3 patients	39	39.0	39.0	89.0
	after seeing 10 patients	8	8.0	8.0	97.0
	doesnot practice hand hygiene	3	3.0	3.0	100.0
	Total	100	100.0	100.0	

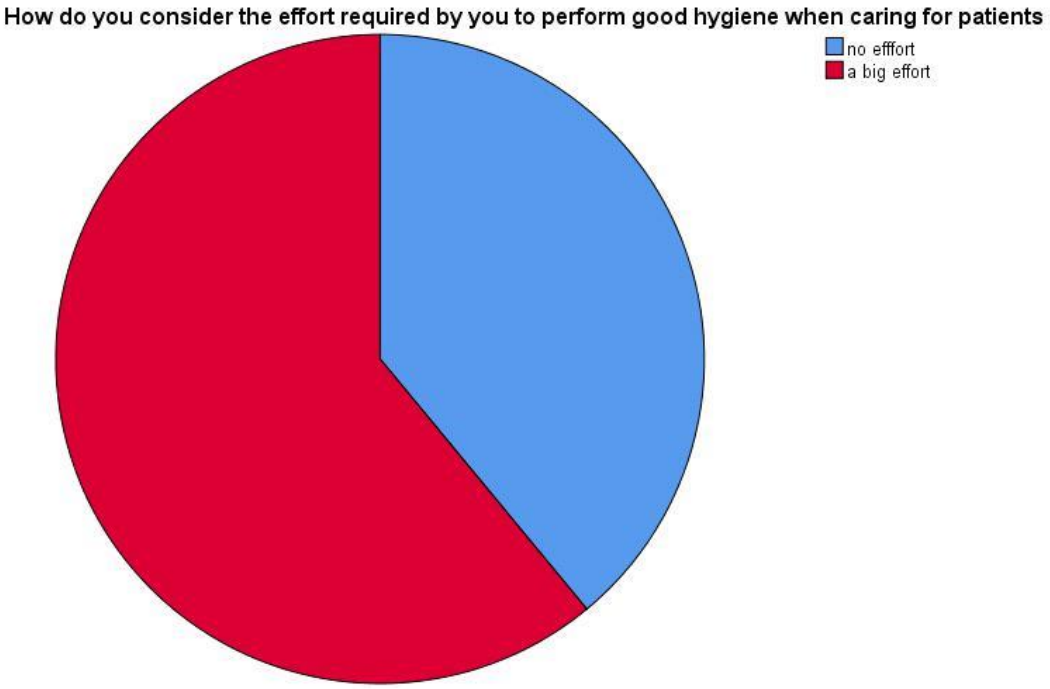


Table 5: What reasons do health care workers cite as being problematic to washing hands with soap and water

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	inconvinient	31	31.0	31.0	31.0
	time consuming	31	31.0	31.0	62.0
	cause skin irritation	12	12.0	12.0	74.0
	cause skin dryness	14	14.0	14.0	88.0
	none	12	12.0	12.0	100.0
	Total	100	100.0	100.0	

Table 6: Which type of hand hygiene method is required before palpation of abdomen

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	rubbing	54	54.0	54.0	54.0
	washing	45	45.0	45.0	99.0
	none	1	1.0	1.0	100.0
	Total	100	100.0	100.0	

Table 7: Which type of hand hygiene required before giving an injection

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	rubbing	40	40.0	40.0	40.0
	washing	60	60.0	60.0	100.0
	Total	100	100.0	100.0	

Table 8: Which type of hand hygiene required after removing examination gloves

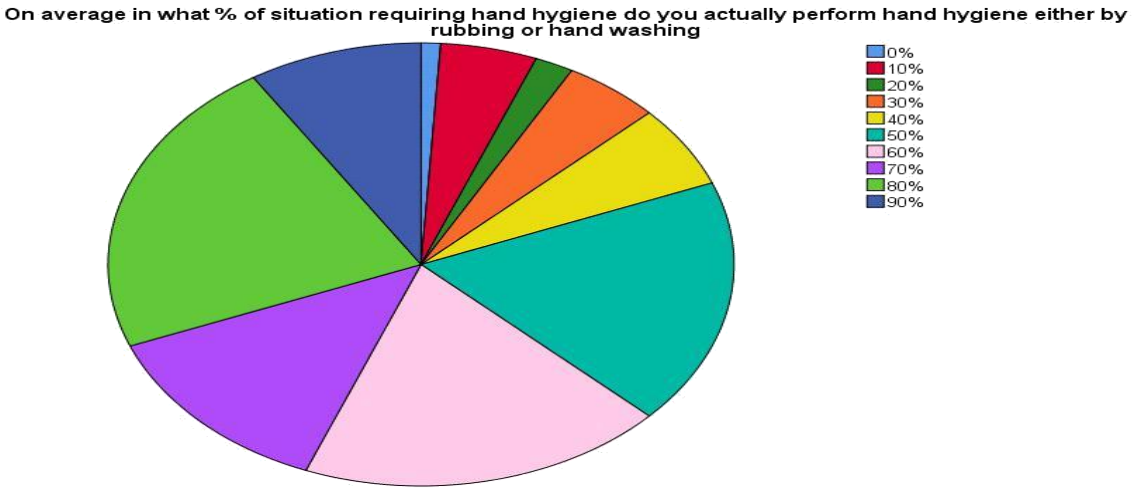
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	rubbing	30	30.0	30.0	30.0
	washing	69	69.0	69.0	99.0
	None	1	1.0	1.0	100.0
	Total	100	100.0	100.0	

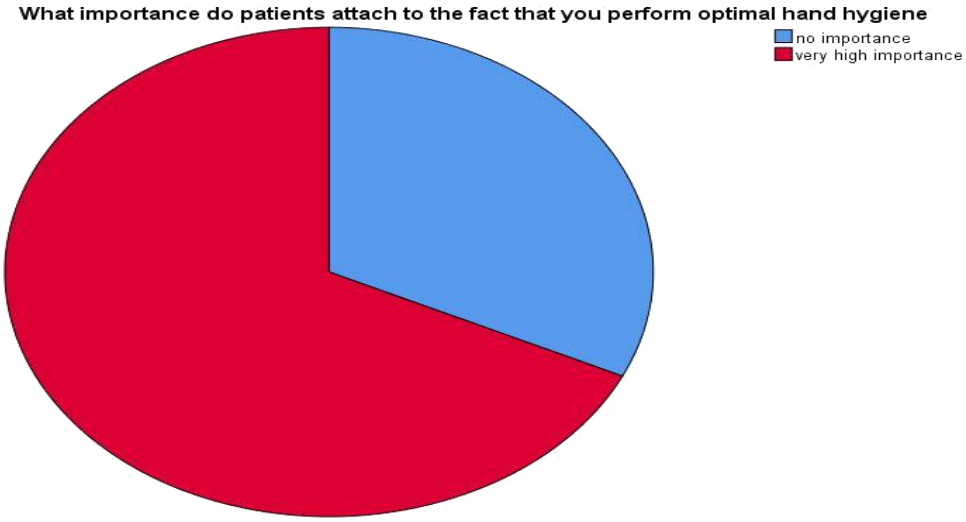
Table 9: Which hand hygiene is reqiured after making patients bed

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	rubbing	19	19.0	19.0	19.0
	washing	81	81.0	81.0	100.0
	Total	100	100.0	100.0	

Table 10: Which hand hygiene is required after emptying bedpan

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	rubbing	16	16.0	16.0	16.0
	washing	84	84.0	84.0	100.0
	Total	100	100.0	100.0	


On average in what % of situation requiring hand hygiene do you actually perform hand hygiene either by rubbing or hand washing
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%


What importance do patients attach to the fact that you perform optimal hand hygiene
no importance
very high importance

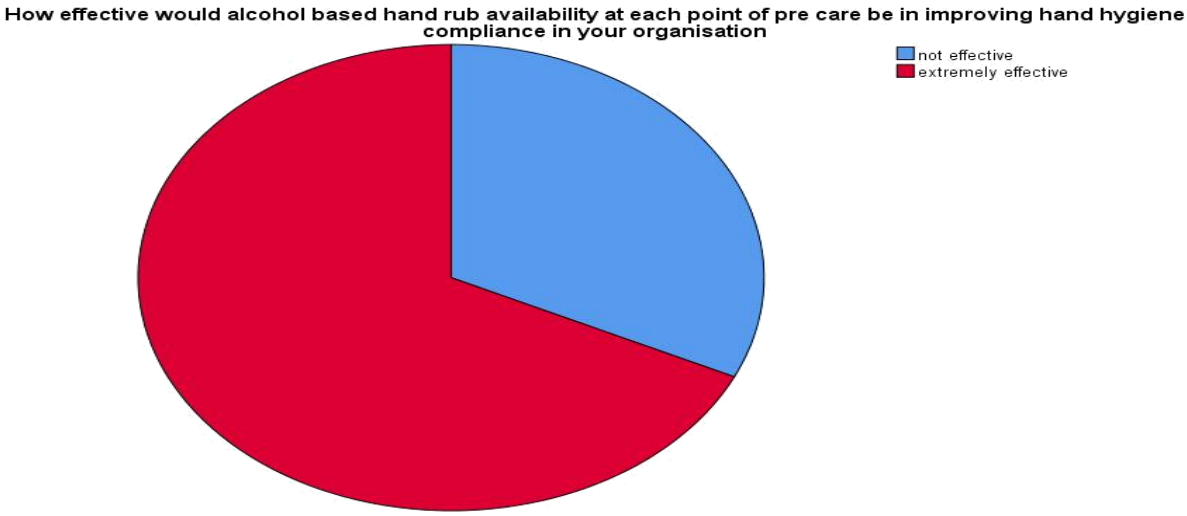

How effective would alcohol based hand rub availability at each point of pre care be in improving hand hygiene compliance in your organisation
not effective
extremely effective

Table 11: Which hand hygiene is required after visible exposure to blood

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	rubbing	17	17.0	17.0	17.0
	washing	83	83.0	83.0	100.0
	Total	100	100.0	100.0	

Table 12:Do you clean your hand before touching a patient

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	57	57.0	57.0	57.0
	No	43	43.0	43.0	100.0
	Total	100	100.0	100.0	

Table 13: Do you clean your hand after patient checkup

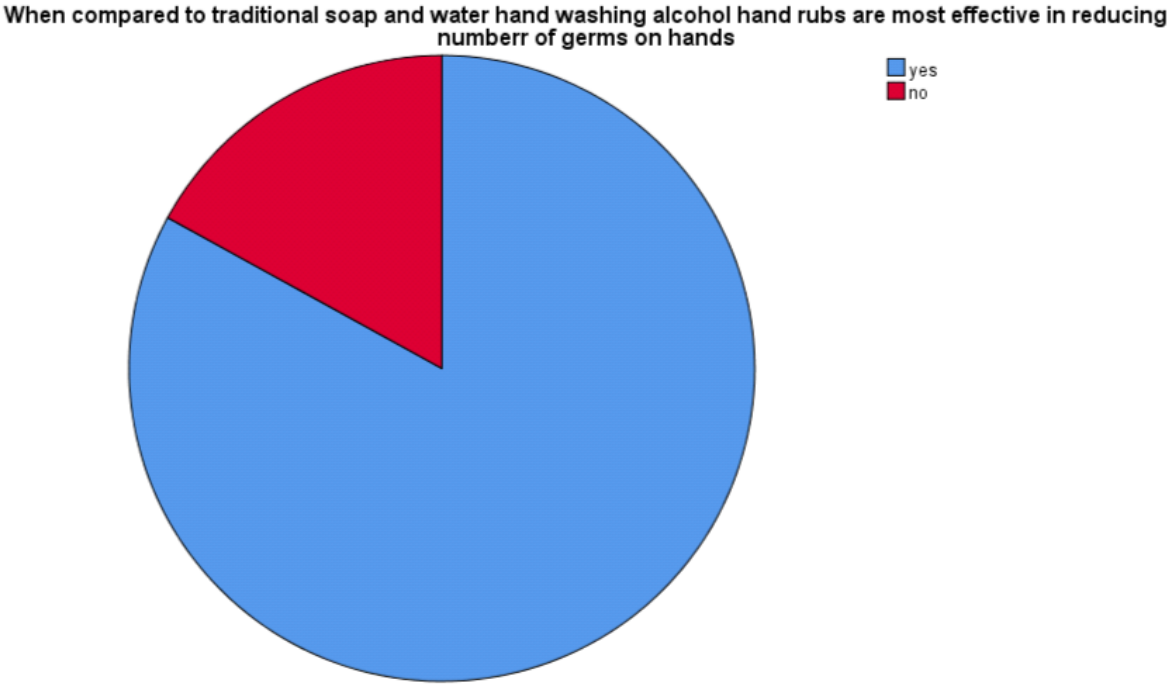
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	78	78.0	78.0	78.0
	No	22	22.0	22.0	100.0
	Total	100	100.0	100.0	

Table 14: Do you clean your hand after touching belongings of patient

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	82	82.0	82.0	82.0
	No	18	18.0	18.0	100.0
	Total	100	100.0	100.0	

Table 15: Do you clean your hand before any aseptic procedures

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	88	88.0	88.0	88.0
	no	12	12.0	12.0	100.0
	Total	100	100.0	100.0	



Do you clean your hand after body fluid exposure

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	93	93.0	93.0	93.0
	no	7	7.0	7.0	100.0
	Total	100	100.0	100.0	

DISCUSSION:

With the ever-increasing patient turn out and the number of procedures being performed on daily basis at the Tertiary health centre, Lahore General Hospital, it is becoming more and more challenging for the young doctors and nurses, who are still acclimatising to the long duty hours and the demands of this job, to follow each and every protocol, from personal hygiene to patient care.

Surprisingly, only 45% of the subjects covered in the research had formal training in hand hygiene in the last 3 years despite 77% of them claiming that hand hygiene is given high or very high priority at their institution. The importance of having a training regarding this matter is reflected in the result of only 47% being well informed in what hand hygiene refers to.

In Iran the study conducted found that most of doctors and nurses have average knowledge of hand hygiene but there is no significant difference between those who have received training and those who had not receive training in knowledge of hand hygiene.(5)

65% of the subjects routinely use alcohol-based hand rub, owing to its ease of use, however, only 52% of them use it for ≥15 seconds. The availability of alcohol-based hand rub at each point of pre-care turned out to not be significant as 32% subjects deemed it as not playing a role in hand hygiene compliance and it was speculated that 35% of subjects, in fact, did not use alcohol-based hand rubs routinely which corresponds to 61% viewing it as an effort demanding task.

Mostly doctors use alcohol-based hand rub for decontamination of hands before patient check-up as recommended in Irish.(8)

A co-relation was found between the high priority given to hand hygiene and significant majority of the subjects understanding its effectiveness in preventing hospital acquired infections by practicing it after patient check-up, coming into contact with patient's belongings, after body fluid exposure and before any aseptic procedure. The out come of 43% not cleaning their hands before patient check-up was surprising despite 68% of subjects asserting that patients attach high importance to them performing optimal hand hygiene.

It was found in U.S that hand hygiene was performed when needed before interaction with patient in 27%, during interaction 0% and after interaction in 63%.

It was observed in Irish that hand hygiene performed was highest after body fluid exposure and lowest after touching patients' surroundings.

In study done in UK it was observed that hand hygiene after body fluid exposure 93%, after patient contact 80%, before patient contact 68% and after contact with patient surrounding 50%. (9)

Finally, 88% of the subjects considered it an inconvenient, time consuming and causing skin irritation and/or dryness which relates with only 13% of the subjects performing hand hygiene in ≤30% of the situations requiring hand hygiene.

CONCLUSION:

Hand hygiene, an important factor in preventing hospital acquired infections, is being neglected by young doctors and nurses due to it being a time consuming and effort demanding task. Complete knowledge of hand hygiene was found missing in majority of the subjects.

RECOMMENDATIONS

- Training workshops be conducted on a yearly basis at the institution
- Senior doctors caution them if they are seen disregarding this basic and fundamental practice.
- In-service education should be given to doctors and nurses.
- Distribution of leaflets regarding hand hygiene practices.
- Lectures and automated dispensers should be given.
- Feedback should be taken on handwashing rates.

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