ISSN: 0975-833X

Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 9, Issue, 01, pp.44972-44976, January, 2017

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

RESEARCH ARTICLE

ASSESSMENT OF HAND HYGIENE PRACTICES AMONG HEALTH CARE WORKERS AND DIFFERENT MODALITIES USED BY THEM TO FOLLOW HAND HYGIENE

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ARTICLE INFO

Article History:
Received 14th October, 2016
Received in revised form
22nd November, 2016
Accepted 08th December, 2016
Published online 31st January, 2017

Key words:

Hand Hygiene Adherence,
Health Care Professionals,
Bedside Hand Rub Solution.

ABSTRACT

AIM: 1. To study the adherence of physicians and other paramedical staff to hand hygiene while attending the patients. 2. To study different modalities used by them for maintaining hand hygiene. 3. To study the beliefs and perceptions of physicians about hand hygiene.
Material and Methods: Cross-sectional study on 80 participants-40 doctors and 40 nurses, selected by simple random sampling, total 960 observations of hand washing opportunities according to the CDC guidelines,12 on each participant in 4 departments medicine, surgery, casualty and C.C.U. Observations were made without their knowledge and then a questionnaire was filled by them.
Statistical analysis: Wilcoxon rank-sum test and Kruskal-wallis rank tests were used for the analysis of the data.
Results: Overall adherence was 13.75 %.there was significant difference in adherence of surgery and other 3 departments, maximum in surgery (27.92%) but they didn't differ much with respect to each other. Also acc. to questionnaire adherence was more if a bed side hand rub solution was present (15% against 5%). No significant difference w.r.t. age, sex, duration of work, pocket hand rub was found. Modalities used were- soap water>sterilium>both.
Conclusion: Overall adherence is low; although more in surgery than other departments, it is still low. Increasing the availability of a bedside hand rub solution can increase adherence.

Citation: Anish Gupta, Bhavna kakkar, Rahul Jain, Sandeep Garg and Narender Pal Singh, 2017. "Assessment of hand hygiene practices among health care workers and different modalities used by them to follow hand hygiene", *International Journal of Current Research*, 9, (01), 44972-44976.

INTRODUCTION

Most common mode of spread of staphylococcus aureus is the hands of health personnel. And most common cause of wound infection is also staphylococcus aureus. Hand hygiene is a simple and short procedure that is an important factor associated with nosocomial infections but despite, adherence to hand hygiene remains low in hospitals (Meengs *et al*., 1994; Kuzu *et al*., 2005; Patarakul*et al*., 2005; Novoa *et al*., 2008; Pan *et al*., 2008; Thompson *et al*., 2008; Pittet *et al*., 2004). Maintaining hand hygiene is in interest of both the health care personnel as well as the patient. Larger studies are lacking in India.

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What is that adherence? What are the modalities used to achieve the same? If found low, what appropriate steps can be taken to improve it? We tried to find answers to these questions with this study. This study also takes a note of beliefs and perceptions of HCP'S about hand hygiene. Also different modalities used by them for pursuit of hand hygiene were observed. The reason behind undertaking this tedious task of observing HCP'S during patient care without their knowledge is to get an idea of actual scenario so that appropriate steps can be taken to improve the adherence if it comes out to be lower than the acceptable figures and to educate the HCP'S to change their perceptions about hand hygiene.

MATERIAL AND METHODS

SETTING: Lok Nayak hospital is a large centre for basic and specialty medical services located in the centre of Delhi, the

capital city of India. Hand washing facilities are available in the OPD's and wards in the form of non medicated soaps as well as liquid hand disinfectant [Sterilium]. Sinks and towels are there in each OPD.

STUDY DESIGN: The study is a cross-sectional study carried out for a period of two months in 80 participants, 40 of whom were doctors and 40 were from nursing. A selection criterion was "simple random sampling"- no special characteristics were seen and every HCP has equal and fair chance of being selected for the study. A total of 960 observations were made and 12 hand washing opportunities were given to each participant according to the CDC guidelines. Following four departments were selected—

- Medicine
- Surgery
- Casualty
- C.C.U

20 participants from each department were taken and out of which 10 were nurses and 10 were doctors. Every participant was taken only once and 12 opportunities were given to him.

After making the observations, a questionnaire was filled from the participant to find his beliefs. Every precaution was taken to observe the health care professional without their knowledge so that it does not affect their natural behavior and perceptions about the issue and to know parameters like age, sex, experience to find if any correlation existed between them and hand hygiene. Also observations regarding modalities used for maintaining hand hygiene were noticed. Approval for this study was taken from the ethical committee.

STATISTICAL ANALYSIS: Motivation to adhere to hand hygiene was assessed on 5 point scale and the rest of the questions on a 7-point scale. The last 2 points of the scale closest to the positive perceptive evaluation were considered positive answers; all other points were considered negative answers (20).

Mean % adherence was calculated in different cases using STATA 9.1 software and wilcoxon rank-sum test was applied in groups with 2 variables and kruskal-wallis rank test was applied in groups with more than 2 variables. A "p-value" of less than 0.05 was taken to be statistically significant difference in comparing adherence using different parameters.

Table 1. Questions asked by questionnaire to test the respective cognition as measured on a 7 point or a 5 point scale.

COGNITIVE FACTOR	QUESTION	MEASURE
Intention to adhere	Do you perform hand hygiene as per recommendations?	7-point scale(never/always)
Knowledge of HH guidelines	Do you know the recommendations of hand hygiene?	7-point scale(not at all/total knowledge)
Attitude towards HH	Do you feel hand hygiene a useful or a useless procedure?	7-point scale (no use at all/very very useful)
Perception of difficulty to adhere	Do you feel it is easy or difficult to follow the recommendations of hand hygiene?	7-point scale (impossible/very easy)
Perception of risk of cross transmission	Does non-compliance with hand hygiene imply a risk of cross-transmission to the patient?	7-point scale (no risk/serious risk)
motivation	Do you feel you can improve your compliance with hand hygiene?	5-point scale (yes, positively/no)

Table 2. Distribution of Opportunities and Adherence with Hand Hygiene among Health Care Professionals at Lok Nayak Hospital, Delhi

Variable	No. of Health Care professionals	Opportunities for Hand Hygiene	Adherence mean % ± S.D (median)	p Value
Sex				0.93
Male	35	420	14.05 ± 12.9	
Female	45	540	13.52 ± 10.5	
Age				
<25 y	17	204	9.80 ± 10.7	
25-30 y	50	600	15.5 ± 12.2	0.1
>30 y	13	156	12.17 ± 8.7	
Designation				0.66
Doctors	40	480	15 ± 13.4	
Nurses	40	480	12.5 ± 9.4	
Experience				
<5 y	25	300	11.67 ±9.9	
5-10 y	40	480	15.4 ± 12.8	0.6
>10 y	15	180	12.78 ± 10.4	
Specialty				
Medicine	20	240	10.83 ± 7.2	
Surgery	20	240	27.92 ± 11.9	0.0001
Casualty	20	240	6.25 ± 4.6	
C.C.U	20	240	10 ± 6.9	
Hands rub at Bedside				0.0033
Yes	70	840	15 ± 11.7	
No	10	120	5 ± 5.8	
No Gloves 0.4				
Yes	45	540	12.78 ± 11	
No	35	420	15 ± 12.26	

Table 3. Beliefs and Perceptions associated with Hand Hygiene Adherence among Health Care Workers at Lok Nayak Hospital, Delhi

Belief of perception	No. of Health Care Workers	Opportunities for Hand Hygiene	Adherence mean % + S.D (median)	p Value
Intention to adhere to hand hygiene				0.60
Yes	39	468	14.74 ± 12.9	
No	41	492	12.8 ± 10.2	
Perception of knowledge about hand hygiene indications				0.76
Yes	39	468	14.74 ± 13.2	
No	41	492	12.80 ± 9.9	
Positive attitude towards hand hygiene after patient contact				0.85
Yes	63	756	14.02 ± 11.9	
No	17	204	12.74 ±10.3	
Perception of difficulty or ease in adhering to hand hygiene				0.78
Yes	27	324	15.12 ± 15.2	
No	53	636	13.05 ± 9.3	
Perception of risk for cross-transmission				0.87
Yes	39	468	14.1 ±12.1	
No	41	492	13.41 ± 11.2	
Motivation to improve adherance to hand hygiene				0.68
Yes	74	888	13.85 ±11.9	
No	06	72	12.5 ± 4.6	

RESULTS

Overall adherence was 13.75%. There was significant difference in adherence between

- Surgery and Medicine
- Surgery and Casualty
- Surgery and C.C.U.

Medicine, casualty or C.C.U. did not differ significantly in adherence. There was also a statistically significant difference in adherence based on presence or absence of a bedside hand rub solution. Adherence was more when a bedside hand rub solution was available, 15 ± 11.7 compared to 5 ± 5.8. No significant difference in adherence was found in relation to age, sex, duration of work, pocket hand rub.

Table 2 shows all the observations, distribution of hand washing opportunities according to different variables and corresponding differences in adherence. Only surgical department and availability of a bedside hand rub solution shows a statistically significant difference in adherence where p value is < 0.05. Table 3 shows the analysis of questionnaire about the thoughts of HCP's regarding hand hygiene and it was found that it was not affecting their adherence since the differences in their adherences depending on their response to the questionnaire did not come out to be statistically significant. Fig I shows the difference in adherence in the 4 departments divided among doctors and nurses as well as combined. Fig II shows difference in adherence with the availability or non-availability of a bedside hand rub solution

Then we also observed the different modalities used by them in achieving hand hygiene.

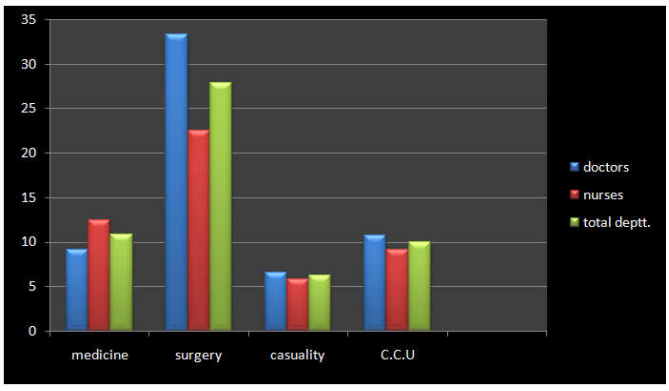

Figure 1.

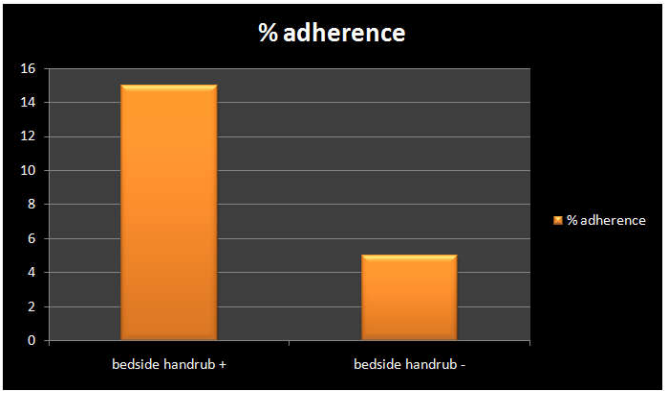

Figure 2.

Figure 3.

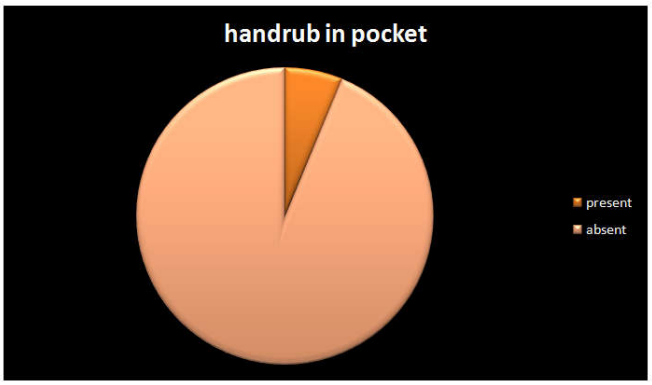

Figure 4.

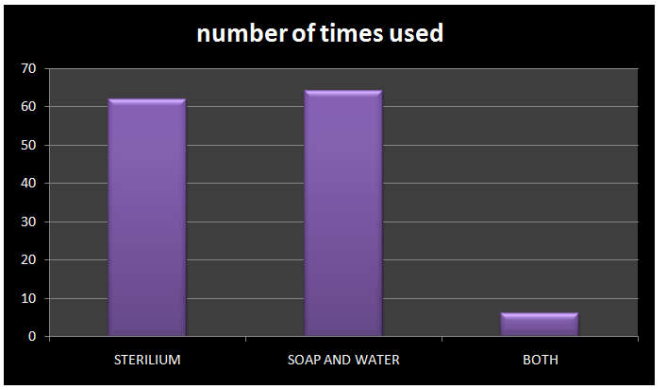

Figure 5.

Figures Ⅲ, Ⅳ and Ⅴ are graphical representations of different means adopted by the 80 participants. Figure Ⅴ shows out of 132 hand washings done from 960 given opportunities, how many times a liquid disinfectant-"sterilium" was used and how many times soap and water.

DISCUSSION

A study by David Pittet, Anne Simon *et al*. also found difference in adherence according to specialty in Geneva hospital but there it was more in medicine than surgery and difference was also found according to professional status and the availability of hand rub solution at bedside as well as pocket. But in our study at Lok Nayak hospital, adherence came out to be more in surgery than medicine and it was seen that presence of bedside hand rub affected the adherence but not a pocket hand rub. A probable explanation is that HCP may realize the need of using the hand rub if it is lying in front of his eyes i.e. at bedside but keeping a hand rub in pocket is not practical at all times especially in such a busy setup like ours.

But keeping a bedside hand rub solution appears to be the most practical and quite effective way to increase the hand hygiene adherence drastically. Significant difference has not come according to status, may be because both doctors and nurses equally realize the importance of hand hygiene in patient care. Surgical adherence is more, it may be because:

- Surgeons are more sensitized regarding issue of hand hygiene as compared to other specialty doctors.
- Surgeons have to open the bandages to see the wounds again and again at each patient bed during post-operative rounds so that their hands get soiled. Thus, they have to do hand washing.

Conclusion

Overall adherence to hand hygiene is low; although it might be more in surgery than in other departments, but it is still low. So, appropriate steps must be taken to improve it. Some suggestions are:-

- Organizing IEC campaigns on hand hygiene recommendations to make HCPs aware of the current guidelines.
- Training sessions can be arranged for medical students to make them aware of the issue right from the beginning so that they can inculcate this habit right in their formative years so as to nip the problem, in the bud. Some studies have measured the increment in adherence after launching such programs (21, 22).
- Further research can be done to find more risk factors associated with adherence to hand hygiene in our hospital as it has been done in others (3, 6, and 22).

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The following questionnaire was filled by the participants.

1. Age----------
2. Sex----------
3. Professional status----------
4. Speciality----------
5. Duration for which you are in medical field----------
6. Do you keep a hand rub solution in pocket?

A) Never B) Rarely C) Sometimes D) Often E) Mostly F) Almost Always G) Always

7. Do You Know the Recommendations Of Hand Hygiene?

A) Not At All B) Little Knowledge C) Some Knowledge D) Enough Knowledge E) Great Knowledge F) Almost Total Knowledge G) Total Knowledge.

8. Do You Perform Hand Hygiene As Per Recommendations?

A) Never B) Rarely C) Sometimes D) Often E) Mostly F) Almost Always G) Always

9. Do You Feel Hand Hygiene A Useful Or A Useless Procedure?

A) No Use At All B) Very Useless C) Little Use D) Some Use E) Useful F) Very Useful G) Very Very Useful

10. Do You Feel It Is Easy Or Difficult To Follow The Recommendations Of Hand Hygiene?

A) Impossible B) Very Difficult C) Difficult D) Not Very Easy E) Easy F) Quite Easy G) Very Easy

11. Does Non-Compliance With Hand Hygiene Imply A Risk Of Cross-Transmission To The Patient?

A) No Risk B) Very Little Risk C) Little Risk D) Moderate Risk E) Great Risk F) Major Risk G) Serious Risk

12. Do You Feel You Can Improve Your Compliance With hand Hygiene?

A) Yes, Positively B) Possibly C) May Be D) May Not Be E) No

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