

Effectiveness of 'Training Program' on knowledge and practices of Hand hygiene among health care workers

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ABSTRACT: Hand hygiene is recognized as the leading measure to prevent cross-transmission of microorganisms and to reduce the incidence of health care associated infections in patients and staff. The aim of the study was to assess the effectiveness of training program on knowledge and practice of hand hygiene among health care workers. A pre-experimental research one group pre-and post-test design 40 health care workers were selected from selected obstetric unit of selected hospital. Total enumeration sampling was used to select the samples to assess the level of knowledge and event sampling method was used to collect the data. Self-made tools like, Demographic variable, Structured Knowledge questionnaire and observational checklist were made by the researcher. Content validity and reliability was done. Teaching program included one day hands-on training cum instruction including supply of printed guideline on Hand hygiene practices. Study findings showed mean age of the participants was 34.78 ± 10.5 years and ranged between 23 and 60 years. Majority 95% of the participants were females. The knowledge score regarding Hand Hygiene was significantly improved from 8.4 ± 2.4 to 12.8 ± 1.9 . The practice score of hand hygiene was significantly improved from 11.1 ± 2.5 to 22.3 ± 2.4 . Present study revealed that the training program on infection control strategies significantly improved the knowledge and practice score regarding hand hygiene

Keywords- Hand Hygiene, Training Program, Knowledge, Practice

Date of Submission: 07-07-2017

Date of acceptance: 27-07-2017

I. Introduction

Hand hygiene is recognized as the leading measure to prevent cross-transmission of microorganisms, and to reduce the incidence of health care associated infections.^{1,2} Despite the relative simplicity of this procedure, the compliance with hand hygiene practices among health care workers is low (40%).³ Continuous efforts are made to recognize effective and sustainable measures to prevent infection related to hand hygiene. Introduction of "My five moments for hand hygiene" by World Health Organization is an important step.

Nurses constitute largest percentage in health team⁴ also considered as "nucleus of the health care system."⁵ Nurse spend supplementary hours with patients their compliance with hand washing seem more fundamental in prevention of disease transmission. A cross-sectional study on five moments of hand hygiene showed moderate knowledge on hand hygiene. Students had poor attitude regarding hand hygiene. Increasing concerns of hospital and healthcare associated infections are also currently recorded across many medical disciplines, even in high income, industrialized countries.⁶ These falling standards of care may include deteriorating infection control practices, resulting in an increased risk of institutionally acquired puerperal sepsis. A cross-sectional study revealed that the knowledge on hand hygiene was moderate among the total study population. The majority of students had poor attitudes towards hand hygiene. Although comparing student nurses with staff nurses had significantly better attitude. Student nurses had better five moments of hand hygiene practices than the staff nurses. Study to assess feasibility and effectiveness of the International Nosocomial Infection Control Consortium (INICC) multidimensional hand hygiene showed that a total of 149,727 opportunities for hand hygiene were observed. Overall hand hygiene compliance increased from 48.3% to 71.4%. Study concluded that adherence to hand hygiene increased by 48% with the INICC approach.⁷

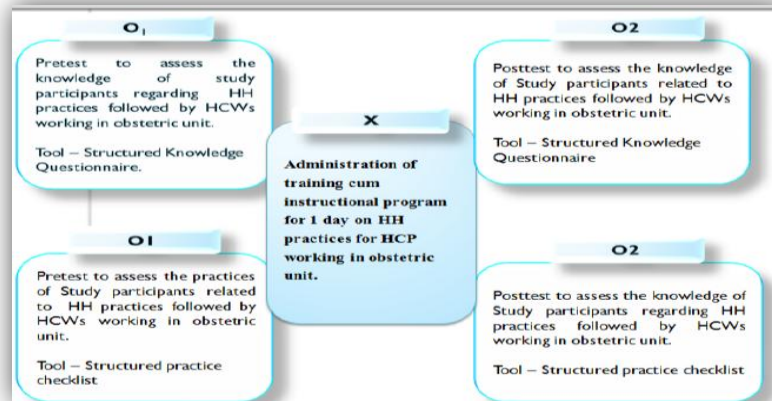
Increasing concerns of hospital and healthcare associated infections are also currently recorded across many medical disciplines, even in high income, industrialized countries.⁸ These falling standards of care may include deteriorating infection control practices, resulting in an increased risk of institutionally acquired puerperal sepsis.

II. Methods And Materials

A pre-experimental research with one group pre-test post-test design, a study was conducted on forty health care workers in selected obstetric unit of selected hospital of Dehradun Uttarakhand. Purposive sampling was used to select the hospital and units where participants were observed for their practices of hand hygiene. Total enumerative sampling was used to collect the data from study participants. Knowledge was assessed by self-made structured knowledge questionnaire from forty participants. Observational checklist was used to assess event sampling for hand hygiene practices. Hand Hygiene was assessed on the basis of three components.

- 1) Facilities for hand hygiene in the unit.
- 2) 5 Moments of hand hygiene.
- 3) 7 steps of hand hygiene.

Teaching program included one day hands-on training cum instruction including supply of printed guideline on Hand hygiene practices was introduced on 13th day of observation.



Schematic representation of study design

III. Study Results

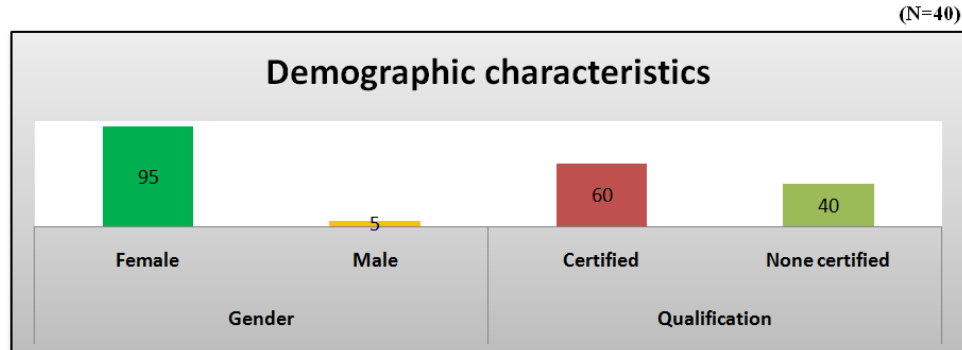
Analysis of collected data is based on the following headings:

Section-I: Description of socio demographic characteristics of study participants.

Section -II: Analysis according to objectives of the study

Section-1: Description of Demographic characteristics of study participants

Graph No. 1: percentage distribution of study variables



Graph no. 1 illustrates that majority (95%) were females. The mean age of the participants was 34.78±10.5, which ranged between 23 and 60 years of age. Most of the workers were certified (60%) professional nurses.

Section – 2 Pre-test knowledge score of hand hygiene (HH)

Table No.1- Mean± SD, Range and mean percentage N=40

S.No.	Area of knowledge	Maximum possible score	Mean± SD	Range	Mean %
1	HH	10	5.8±1.6	2-9	58%

Table no.1 exemplifies hand hygiene (HH) Mean \pm SD score was 5.8 ± 1.6 and ranged between two and nine. The mean knowledge percentage was 58 %.

Section – 2.1 Pre-test practice score of Facilities for hand hygiene in the unit

Table No.2: Mean, SD, range and compliance percentage (N= 12)

S. No	Facilities	Maximum possible score	Mean \pm SD	Range	Compliance percentage
1	HH	10	5.4 ± 0.6	5 - 7	54%

Table No. 2 depicts hand hygiene Mean \pm SD score is 5.4 ± 0.6 , ranged between five to seven and the practice compliance of unit facility was 54%. Thus it shows pretest compliance percentage in terms of practice score of Facilities for hand hygiene was only 54.

Section – 2.2 Pre-test practice score of five moments of hand hygiene

Table No. 3: Mean, SD, range and compliance of hand hygiene (N=36)

S.No	Area of practice	Maximum possible score	Mean \pm SD	Range	Compliance percentage
1	Overall score	15	7.4 ± 1.7	5 - 12	49%
2	Five moments of HH	5	2.2 ± 0.9	1 - 5	44%
3	Steps of HH	10	5.1 ± 1.0	4 - 8	51%

Table no. 3 depicts mean practice score regarding hand hygiene was 7.4 ± 1.7 ranged between five and twelve, five moments of hand hygiene was 2.2 ± 0.9 ranged between one and five and steps of hand hygiene was 5.1 ± 1.0 ranged between four and eight. The overall compliance related to hand hygiene was 49 %, five moment of hand hygiene was 44% and for steps of hand hygiene was 51%.

Section 3 Effectiveness of training program on knowledge of hand hygiene

Table No.4: Pre-test and post-test knowledge score of hand hygiene (N= 40)

Area of knowledge	Pre test Mean \pm SD	Post test Mean \pm SD	MD \pm SD	95% confidence interval of the difference		't' value	p value
				Lower	Upper		
Hand Hygiene	5.8 ± 1.6	8.5 ± 0.8	2.6 ± 1.7	2.1	3.2	9.9	< 0.001

Paired sample 't' test was used, $t = 2.02$ at $df = 39$ at the level of $p < 0.05$ * significant.

Table no.4 shows the mean post-test knowledge score regarding hand hygiene was 8.5 ± 0.8 and pre-test knowledge score was 5.8 ± 1.6 . The mean difference between post-test and pre-test knowledge score was 2.6 ± 1.7 . The calculated 't' value 9.9 was higher than that of the tabulated value of 2.023 at 0.05 level of significance ($df = 39$). Hence the null hypothesis was rejected and the research hypothesis was accepted.

Therefore, mean post-test knowledge score regarding hand hygiene was significantly higher than that of mean pre-test knowledge score ($p < 0.05$). So the significant improvement in knowledge score can be attributed to the training program administered to the subjects between pre-test and post-test results.

Section 3.1 Effectiveness of training program on Pre and post-test of Hand hygiene practice score

Table No. 5: Comparisons of mean of pre-test and post-test practice score on hand hygiene. (N= 36)

Area of practice	Max. possible score	Pre test (mean \pm SD)	Post test (mean \pm SD)	MD	95% confidence interval of the difference		't' value	p value
					lower	Upper		
Over all	15	7.42 ± 1.7	14 ± 0.6	6.5	5.9	7.1	21.6	<0.001
Five moments of HH	5	2.2 ± 0.9	5.0 ± 0.0	2.7	2.4	3.1	16.8	<0.001
Steps of HH	10	5.1 ± 1.0	9.0 ± 0.6	3.8	3.4	4.2	18.7	<0.001

*Independent 't' test was used, $t = 2.02$ at $df = 34$ at the level of $p < 0.05$ * significant

Table no.5 illustrates the mean post-test practice score regarding hand hygiene was 14 ± 0.6 and the mean pre-test practice score was 7.42 ± 0.6 . The mean difference between post-test and pre-test practice score was 6.5. The calculated 't' value 21.6 was higher than that of the tabulated value of 2.02 at 0.05 level of significance ($df = 34$). Hence the null hypothesis was rejected and the research hypothesis was accepted.

The mean post-test practice score regarding five moment of hand hygiene was 5.0 ± 0.0 and the mean pre - test practice score was 2.2 ± 0.9 . The mean difference between post-test and pre-test practice score was 2.7. The calculated 't' value 16.8 was higher than that of tabulated value of 2.02 at 0.05 level of significance ($df =$

34). The mean post-test practice score regarding steps of hand hygiene was 9.0 ± 0.6 and the mean pre-test practice score was 5.1 ± 1.0 . The mean difference between post-test and pre-test practice score was 3.8. The calculated 't' value 18.7 was higher than that of the tabulated value of 2.02 at 0.05 level of significance ($df=34$). Hence the null hypothesis was rejected and the research hypothesis was accepted

Section 3.2 Difference between pre and post observation scores

Table No. 6 Pre and Post observation HH practices related to unit facilities after intervention (N=12)

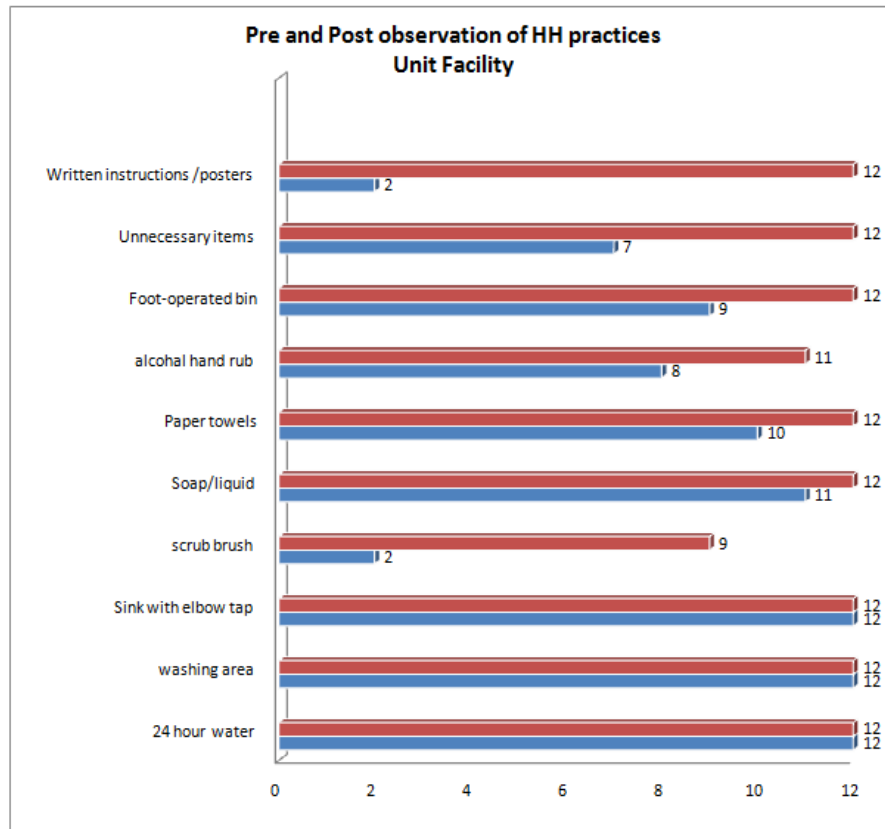


Table no. 15 illustrates the Item wise compliance score regarding HH related to unit facilities. Availability of 24 hour water, sink and hand washing area was already in place before intervention (f=12) so that there was no scope for improvement. All other unit facilities related to HH have improved from pre-test to post-test.

IV. Conclusion

Hand washing is one of the first infection control measures to be performed by all health care givers. Good knowledge and efficient hand hygiene helps to reduce incidence of hospital acquired infections (HAIs). The study results showed statistical evidences of effectiveness of training program in terms of increase in knowledge and quality of hand hygiene practices. The periodic training programs are necessary to enhance the quality care and less chances of infection and unnecessary hospital stay of patients.

V. Discussion

The present study showed hand hygiene compliance of 58%. Similar findings were reported by Nagaraju B., mahadeo B. other study showed poor attitude of staff nurses and student nurses regard to hand hygiene. Recent study showed training program on hand hygiene significantly improved the knowledge and practices of health care workers, which is supported by many other studies Deepak KK⁷, Pinnapati S.⁸, Basarkar S.⁹, Spector JM¹⁰, and Rosenthal VD¹¹ Significant increasing increase in hand hygiene practices adherence among HCW was found to be improved with training programs. Similar findings were revealed by Sehmitzet al.¹²

VI. Recommendations

Further studies can be conducted on medical students to assess their hand hygiene Practices. Educating health care workers will enhance the quality nursing care. Infection control nurse can establish periodic training programs to increase adherence and compliance on hand hygiene practices. Observations on regular basis by nurse supervisors will help in improving practice standards.

Acknowledgement

I would like to thank Ms. Anjana Williams, Faculty Himalayan College of Nursing for helping me develop the deeper understanding of research.

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Reena Marandi. "Effectiveness of 'Training Program' on knowledge and practices of Hand hygiene among health care workers." *IOSR Journal of Nursing and Health Science (IOSR-JNHS)* 6.4 (2017): 08-12.