Assessment of Infection Control Training among Healthcare Workers in Three Tertiary Care Public Hospitals, Bangladesh, 2015-17

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Abstract

Background: *Hospital-acquired infections (HAI) are a rising global public health concern that disproportionately affects low and middle-income countries with scarce resources for infection-control. Healthcare workers (HCWs) are the frontline work-stream against HAI and cross-transmission of pathogens in healthcare settings. As part of a pilot infection prevention and control (IPC) program, we assessed the acceptability and effect of training in infection control practices among HCWs in three tertiary care public hospitals in Bangladesh to better mitigate HAI risks and occupational exposures.*

Methods: *We piloted an IPC intervention, as a part of the emergency preparedness, during from 2015 to 2017 with an intervention package and IPC training to HCWs was one of the key components. Trained IPC staff conducted a half-day training session for three different level HCW groups, doctors, nurses and support staff in medicine and pediatric wards. The training comprised of instructive lectures and videos on standard precautions and transmission-based precautions followed by infection control techniques. A practical demonstration was held followed by hands-on training on handwashing, hand rubbing steps and wearing of masks and gloves. The participants' attitudes and practices on infection control measures were obtained through structured observation and qualitative interviews.*

Results: *A total of 1562 HCW's participated in the training: 804 doctors, 445 nurses and 313 support staff in 26 training sessions. Majority of the participants (85%) did not receive any formal training earlier on infection control but were aware of the basics as part of IPC other training programs. None of the hospitals had an IPC committee. In the interactive sessions, participants often provided incorrect responses about basic IPC principals. We found significant increase after the training from 0% at baseline to 24% (p<0.001) in hand hygiene, 43% (p<0.001) in mask use and 45% (p<0.001) in gloves use. All respondents (n=84) from the qualitative assessment, reported the training as effective and they were able to reinforce their learning in action in the hospitals with the available supplies from the intervention program. Participants from all three groups urged to arrange refresher training sessions in hospital wards more frequently and in small groups to uphold the practices.*

Conclusion: *This pilot program demonstrated that HCWs lack basic IPC principals and that tailored IPC training sessions can significantly improve HCWs IPC practice. Formation of active IPC committee and availability of resources including periodic refresher training or short in-service training updates for all categories of HCWs to adopt regular IPC practice.*

Keywords: *Healthcare workers, hospital acquired infections, infection prevention and control, training, practice.*

Introduction

- Hospital-acquired infections (HAI) are a rising global public health concern that disproportionately affects low and middle-income countries with scarce resources for infection-control.
- Healthcare workers (HCWs) are the frontline work-stream against HAI and cross-transmission of pathogens in healthcare settings.
- Trainings to empower HCWs to better identify and mitigate HAI risks and occupational exposures is particularly vital in low-resource settings with high HAI rate .
- This study aimed to assessed the outcome of an infection prevention and control training (IPC) program among different level of HCWs in tertiary care hospitals.

Objectives

- To assess the acceptability and feasibility of training on infection prevention and control (IPC) among HCWs.
- To explore the attitudes and practices on infection control measures among HCWs.
- To assess the impact of training on infection control practices among in their daily routine services.

Methods

- **Study Sites:** Three (3) tertiary level healthcare hospitals in Bangladesh.
  [Average inpatient capacity 500-1200 beds with approx 170% bed occupancy rate]
- **Study wards:** Medicine Ward (Male & Female) and Pediatric Ward.
- **Target group:** Doctor, Nurse and Support staff (Cleaner, Ward boy)
  [Healthcare workers (HCW) of the hospitals who involved in any patient care].
- **Study Period:** 2015-2017
- **IPC Training conduction:**
  As a part of IPC Intervention for emergency preparedness, a half-day training session on infection control measures was conducted with each of the three different HCW groups. This training comprised instructive lectures and videos on:
  - Standard precautions
  - Transmission-based precautions
  - Infection prevention and control techniques.
  - Hands-on training on hand rubbing steps with hand sanitizer.
  - Action learning on handwashing steps with soapy water.
  - Practical demonstration on wearing of masks and surgical gloves.
- **Data Collection:** Changes on infection prevention and control practices were assessed by
  - Quantitative assessment: Structured observation
  - Qualitative assessment: Interviews, group discussions.

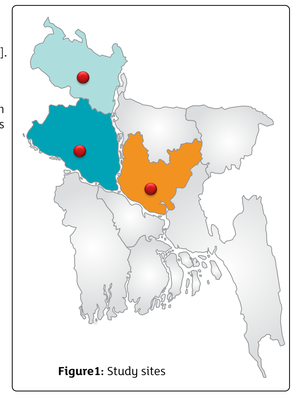

Figure1: Study sites

Results

Training participants:

- A total of 1562 Healthcare Worker (HCW) took part in 26 half-day training sessions.
- Most participant s 804 (51%) were doctors followed by 445 (29%) nurses and 313 (20%) support staff.
- Majority of the HCW were females (59%) with the exception of male doctors, twice as high as female doctors.

HCW	Number of participants (HCW)			
	FMCH (N=387) n (%)	RMCH (N=593) n (%)	RpMCH (N=582) n (%)	Total (N=1562) n (%)
Doctor	142 (18)	328 (41)	334 (42)	804 (51)
Nurse	145 (33)	156 (35)	144 (32)	445 (29)
Support Staff	100 (32)	109 (35)	104 (33)	313 (20)

Table 1: Hospital basis training participants

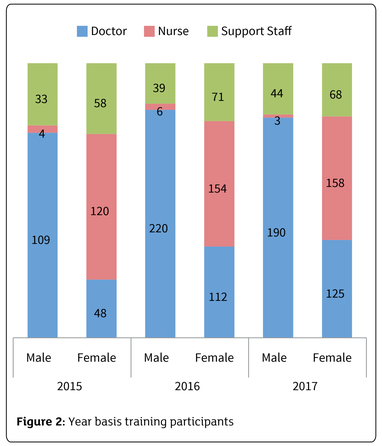

Figure 2: Year basis training participants

Existing activities on IPC in study hospitals:

- A largest portion of the participants (85 per cent) did not receive any specific infection control training.
- In the interactive sessions, participants often provided incorrect responses about basic IPC principals.
- None of the hospitals at any level had an IPC committee.

Figure 4: IPC training with Doctors in a study hospital

Changes in IPC behaviour among HCWs from structured observations:

- Structural observations were performed for a total of 96 hours at baseline and 118 hours at the endline.
  At the baseline, total 1112 hand hygiene opportunities (among 1525 event) and at the endline 932 HH opportunities (in 1448 events) were observed for HCW.
- A significant increase in hand hygiene practices was found after the IPC training: from 0% at baseline to 24% (p<0.001).
- Mask use was found to go up from 0% to 43% (p<0.001) among healthcare workers.
- Approximately 45% (p<0.001) gloves use was found to increase from 0% at baseline following the IPC training.
- The use of gloves was found to increase by approximately 45 percent (p<0.001) following the training from 0% in the baseline.

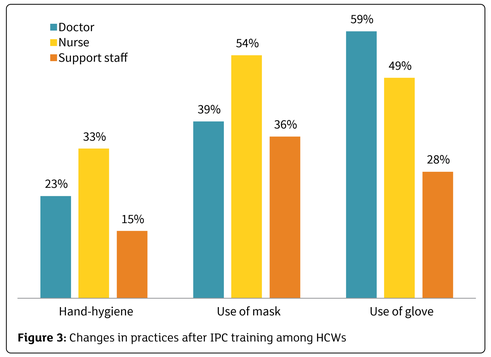

Figure 3: Changes in practices after IPC training among HCWs

Figure 5: IPC training with Nurses in a study hospital

Feedback from qualitative assessment on IPC training:

- A total of 84 interviews were conducted for qualitative assessment, including 29 doctor interviews, 28 nursing interviews and 27 interviews with support staff.
- All the respondents reported the training as effective which strengthen their knowledge with the available supplies from the intervention program.
- Participants from all three groups urged to arrange at least one refreshing IPC training session in every two month in hospital.
- All participants recommended to conduct the IPC training in small groups to ensure the continuity of IPC practices.

Barriers in maintaining proper IPC practice:

- Shortage of manpower and high patient turnover in the tertiary Govt. hospitals.
- Both Healthcare workers and family caregivers were often seen to be reluctant to follow the procedures .
- Lack of supplies and improper waste management hamper and disregard the HCWs for practicing IPC.
- Lack of active monitoring was identified to influence the IPC practices.

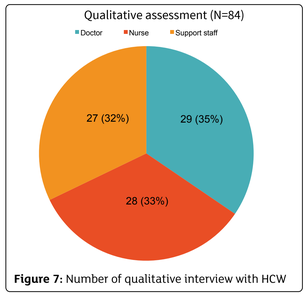

Figure 7: Number of qualitative interview with HCW

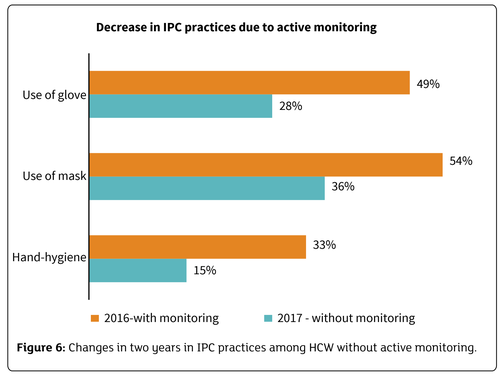

Figure 6: Changes in two years in IPC practices among HCW without active monitoring.

Study Limitation:

- Immediate knowledge differences of participated HCWs was not assessed after IPC training .
- Detailed demographic information of participating HCWs was not collect during IPC training in study hospitals.

Figure 8: Hand Hygiene demonstration with Support Staff at IPC training

Figure 9: Hand Hygiene demonstration with Intern Doctor at IPC training

Conclusion

- This pilot program demonstrated that HCWs lack basic IPC principals and tailored IPC training sessions can significantly improve HCWs IPC practice.
- The combination of learning and availability of resources played an prominent role behind the rising level of practices among training participants.

Recommendation

- Formation of active IPC committee could enable arranging periodic refresher training or short in-service for all categories of HCWs.
- Vigorous and habitual monitoring system from administrative level should be introduced.
- Arrangement of periodic & short length refreshing IPC training throughout the year.
- Assuring the supplies and reallocation of resources should be adopt for the continuation of IPC practice.
- Awareness and message convey system on IPC to the family caregivers from hospitals should be developed.

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