HOW TRAINED OUR TRAINEE: KUWAIT EXPERIENCE

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Outline

- The problem
- Kuwait training experience:
  - Bachground
  - Design
  - Material and methods
  - Result
  - Conclusions

The problem

- Infection prevention and control (IPC) is a key component of practice for all HCPs
- HCPs have poor compliance with even the most basic of IPC procedures.
- HH compliance universally low.
- HH compliance in Kuwait by direct observation of HCPs using WHO method -lowest among doctors (45.6%)
- Other IPC measures
- High risk, special situation

Systematic Review of Studies on Compliance with Hand Hygiene Guidelines in Hospital Care

Vicki Erasmus, MSc; Thea J. Daha; Hans Brug, PhD; Jan Hendrik Richardus, MD, PhD; Myra D. Behrendt, MSc; Margreet C. Vos, MD, PhD; Ed F. van Beeck, MD, PhD

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Design. A systematic review of studies published before January 1, 2009, on observed or self-reported compliance rates.

Methods. Articles on empirical studies written in English and conducted on general patient populations in industrialized countries were included. The results were grouped by type of healthcare worker before and after patient contact. Correlates contributing to compliance were grouped and listed.

Results. We included 96 empirical studies, the majority ($n = 65$) in intensive care units. In general, the study methods were not very robust and often ill reported. We found an overall median compliance rate of 40%. Unadjusted compliance rates were lower in intensive care units (30%–40%) than in other settings (50%–60%), lower among physicians (32%) than among nurses (48%), and before (21%) rather than after (47%) patient contact. The majority of the time, the situations that were associated with a lower compliance rate were those with a high activity level and/or those in which a physician was involved. The majority of the time, the situations that were associated with a higher compliance rate were those having to do with dirty tasks, the introduction of alcohol-based hand rub or gel, performance feedback, and accessibility of materials. A minority of studies ($n = 12$) have investigated the behavioral determinants of hand hygiene, of which only 7 report the use of a theoretical framework with inconclusive results.

Conclusions. Noncompliance with hand hygiene guidelines is a universal problem, which calls for standardized measures for research and monitoring. Theoretical models from the behavioral sciences should be used internationally and should be adapted to better explain the complexities of hand hygiene.

The problem

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Adherence to Ventilator-Associated Pneumonia Bundle and Incidence of Ventilator-Associated Pneumonia in the Surgical Intensive Care Unit

Dorothy Bird, MD; Amanda Zambuto, NP; Charles O'Donnell, MS, RRT; Julie Silva, RRT; Cathy Korn, M
Robert Burke, MA; Peter Burke, MD; Suresh Agarwal, MD

Arch Surg. 2010;145(5):465-470. doi:10.1001/archsurg.2010.69.

Table. Ventilator-Associated Pneumonia Bundle Compliance

	2007	
Bundle Item	**SICU**	**TICU**
DVT prophylaxis	83 (77-88)	78 (73-84)
HOB elevation	77 (73-82)	65 (57-72)
Peptic ulcer prophylaxis	98 (96-99)	99 (98-100)
Sedation break	98 (97-99)	97 (96-99)
Assessment for extubation	96 (94-98)	92 (87-97)
Total bundle compliance	**63 (57-69)**	**53 (46-60)**

Infection Control Assessment of Ambulatory Surgical Centers

Melissa K. Schaefer, MD; Michael Jhung, MD, MPH; Marilyn Dahl, MA; Sarah Schillie, MD, MPH, MBA; Crystal Simpson, MD, MHS; Eloisa Llata, MD, MPH; Ruth Link-Gelles, MPH; Ronda Sinkowitz-Cochran, MPH; Priti Patel, MD, MPH; Elizabeth Bolyard, RN, MPH; Lynne Sehulster, PhD; Arjun Srinivasan, MD; Joseph F. Perz, DrPH, MA

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JAMA. 2010;303(22):2273-2279. doi:10.1001/jama.2010.744.

Design All State Survey Agencies were invited to participate.

- 7 states volunteered; 3 were selected
- A stratified random sample of ASCs >> 68 ASCs ; 32 in Maryland, 16 in North Carolina, and 20 in Oklahoma.
- Assessments focused on 5 areas of infection control: hand hygiene, injection safety and medication handling, equipment reprocessing, environmental cleaning, and handling of blood glucose monitoring equipment.

RESULTS

- 67.6% of ASCs had at least 1 lapse in IC;
- 17.6% of ASCs had lapses identified in 3 or more categories.
- Common lapses included :
  - using single-dose medication vials for more than 1 patient (28.1%)
  - failing to adhere to reprocessing of equipment (28.4%),
  - handling of blood glucose monitoring equipment (46.3%)

The problem

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SARS outbreak itself is an example of how, despite the reported effectiveness of standard and airborne infection control safety measures, the precautions were apparently incomplete or were intermittently applied, thereby resulting in occupational transmission.

It has been reported that 8 of 32 nurses working with SARS pts later became infected , 3 of 23 nurses (13%) consistently wore a mask (either surgical or N95) compared with 5 of 9 nurses (56%) did not consistently wear a mask. Loeb et al. (2004)

The problem

- Significant differences between:
  - profession
  - Gender
  - Age

- Doctors and nurses differed significantly in compliance with washing hands before and after patient contact and with wearing gloves when taking blood.

- Physicians' compliance with handwashing was the lowest (Berhe et al. 2005; Lipsett and Swoboda 2001; Salemi et al. 2002).

- Estimations of BBV transmission risks. 86% of nurses stated that they treat each patient as if they are carrying a BBV compared with 41% of doctors.

- Doctors more likely to re-sheath used needles manually than were nurses.

J Hospital infection 2003 May;54(1):68-73.

A survey of doctors and nurses in Birmingham teaching hospitals.

- Doctors more likely to be injured than nurses .

- 28% percent of these doctors and 2% of the nurses did not report their needlestick injuries

The problem

- Significant differences between:
  - profession
  - Gender
  - Age

Journal of Hospital Infection
Volume 49, Issue 1, September 2001, Pages 55–58

Short Reports

High-level handwashing compliance in a community teaching hospital: a challenge that can be met!

R. Sharir[a], N. Teitler[a], I. Lavi[b], R. Raz[a,f1]

- 300 uninformed staff members were observed for hand washing practices throughout the working day
- 1035 opportunities .
- The observations were categorized by gender
- Females complied more than males (69 vs. 80%, $P<0.0001$)

Determinants of Healthcare Workers' Compliance with Infection Control Procedures
Annalee Yassi et al.

Healthcare Quarterly Vol. 10 No.1 2007

- A cross-sectional correlational survey approach was used to explore compliance factors in a total of 16 acute care facilities in the province of British Columbia, Canada.

- Male significantly less compliant with all types of infection control practices

- and significantly less likely to clean their hands.

The problem

- Significant differences between:
  - profession
  - Gender
  - Age

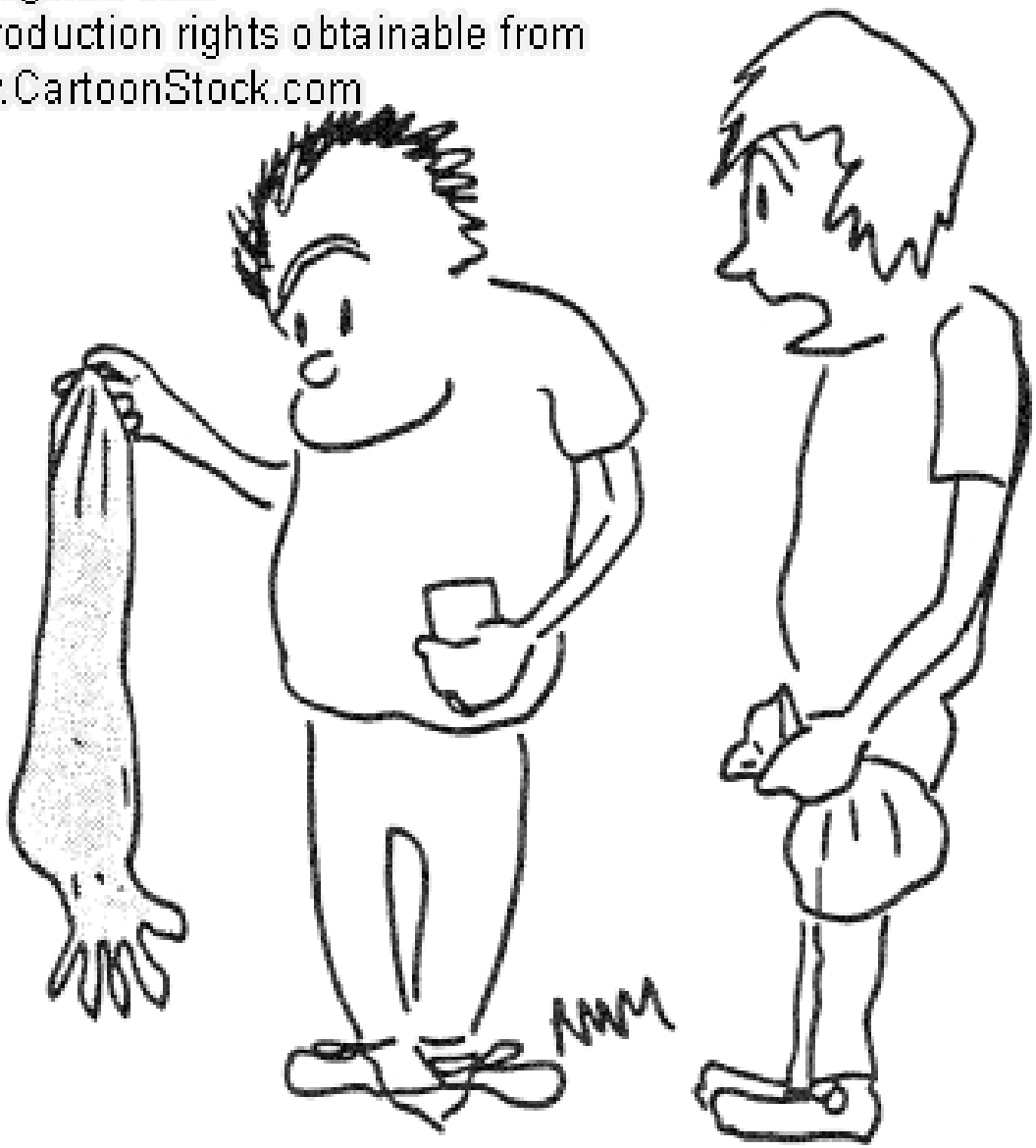
Determinants of Healthcare Workers' Compliance with Infection Control Procedures

Annalee Yassi, Karen Lockhart, Ray Copes, Mickey Kerr, Marc Corbiere, Elizabeth Bryce and members of the SARS study team

Compliance with Universal Precautions in Correctional Health Care Facilities.

Gershon, R.R., C.D. Karkashian, D. Vlahov, L. Kummer, C. Kasting, J. Green-McKenzie, J.A. Escamilla-Cejudo, N. Kendig, A. Swetz and L. Martin. 1999.
Journal of Occupational and Environmental Medicine 41(3): 181–9.

Younger workers (19–29 years of age) had better compliance than older workers (50+ years).



"That's sure a funny lookin' sandwich bag!"

The problem

- 58% of medical students did not know the correct indications for using alcoholic hand gel, 35% did not know the correct use of gloves
- Survey in 3 UK teaching hospitals: Overall knowledge of risks BBV transmission from an infected pt after needlestick injury [44.0% for HBV, 38.1% for HCV, 54.6% for HIV].
- Less often medical school train on IPC.
- 64% medical students reported formal teaching on HH (Mann. 2006)
- 30% HCWs felt they were not offered the necessary training.
- Only 5% HCPs rated their training in infection control as excellent
- Training usually focuses on HH and does not include other IPC

Programs focused on education and performance feedback of HCPs is effective in promoting IPC and lowering HAIs rates.

Crit Care Med. 2003 Jul;31(7):1959-63.

An educational intervention to prevent catheter-associated bloodstream infections in a nonteaching, community medical center.

Warren DK, Zack JE, Cox MJ, Cohen MM, Fraser VJ.

Washington University School of Medicine, Saint Louis, MO 63110, USA. dwarren@im.wustl.edu

Abstract

OBJECTIVE: To evaluate the effectiveness of an evidence-based intervention to prevent catheter-associated bloodstream infections among intensive care unit patients at a nonteaching, community hospital.

DESIGN: Nonrandomized pre/post observational trial.

SETTING: Two intensive care units at Missouri Baptist Medical Center, Saint Louis, MO.

PARTICIPANTS: Nurses and critical care physicians.

INTERVENTION: A ten-page, self-study module on the prevention of catheter-associated bloodstream infections, lectures, and posters given between July and September 1999.

MEASUREMENTS: The incidence of nosocomial catheter-associated bloodstream infection and patient demographics were measured for patients admitted between March 1998 and July 2000.

MAIN RESULTS: Thirty cases of catheter-associated bloodstream infections during 6110 catheter-days were noted in the preintervention period (4.9 cases/1000 catheter-days) vs. 11 cases during the 5210 catheter-days in the postintervention period (2.1 cases/1000 catheter-days). The relative risk for catheter-associated infection in the postintervention period was 0.43 (95% confidence interval, 0.22-0.84). Among catheterized patients, Acute Physiology and Chronic Health Evaluation II score (25.2 preintervention vs. 25.1 postintervention; p =.86), hemodialysis (91 of 647 [14%] patients vs. 69 of 541 [13%]; p =.70), and the mean number of catheter days per patient (9.1 vs. 9.6 days; p =.46) did not differ between the pre- and postintervention periods.

Clinical Investigations in Critical Care | November 2004

The Effect of an Education Program on the Incidence of Central Venous Catheter-Associated Bloodstream Infection in a Medical ICU*

FREE TO VIEW

David K. Warren, MD; Jeanne E. Zack, BSN; Jennie L. Mayfield, MPH; Alexander Chen, MD; Donna Prentice, MSN; Victoria J. Fraser, MD; Marin H. Kollef, MD, FCCP

Intervention:
A mandatory education program directed toward ICU nurses and physicians

results:
74 episodes of catheter-associated bloodstream infection occurred in 7,879 catheter-days (9.4 per 1,000 catheter-days) in the 24 months before the educational program.
Following implementation of the intervention, the rate of catheter-associated bloodstream infection decreased to 41 episodes in 7,455 catheter days (5.5 per 1,000 catheter-days) [p = 0.019].

Kuwait experience

Background

- A first step in the development of interventions aimed at improving adherence to infection control measures by changing behavior is a careful evaluation of the knowledge and attitude of HCWs.
- Education is pivotal to the outcome of effective healthcare-associated training programs and nowhere is this more apparent than in IPC.
- Studies showed that focused, educational intervention resulted in a significant, sustained reduction in the incidence of healthcare-associated infection.
- As newly graduate doctors represent a key group of stakeholders responsible for the delivery of recommended IPC

Education of Physicians-in-Training Can Decrease the Risk for Vascular Catheter Infection

Robert J. Sherertz, MD; E. Wesley Ely, MD, MPH; Debi M. Westbrook, RN; Kate S. Gledhill, RN; Stephen A. Streed, MS; Betty Kiger, RN; Lenora Flynn, MT; Stewart Hayes, RRT; Sallie Strong, RN; Julia Cruz, MD; David L. Bowton, MD; Todd Hulgan, MD; and Edward F. Haponik, MD

[+] Article and Author Information

Ann Intern Med. 2000;132(8):641-648. doi:10.7326/0003-4819-132-8-200004180-

- **Setting:** 6 ICUs and one step-down unit at Wake Forest University Baptist Medical Center, North Carolina.
- **Participants:** 3rd yr medical students and physicians in 1st postgraduate yr.
- **Intervention:** A 1-day course on infection control practices and procedures
- **Measurements:** Surveys assessing physician attitudes toward use of sterile techniques during insertion of CVCs

- **Results:**
- The perceived need for full-size sterile drapes was 22% in the year before the course and 73% 6 months after the course (*P*Â <Â 0.001).
- Documented use of full-size sterile drapes increased from 44% to 65% (*P*Â <Â 0.001).
- The rate of catheter-related infection decreased from 4.51 infect per 1000 pt-days before the course to 2.92 infect per 1000 pt-days 18 months after the course (*P*< 0.01).

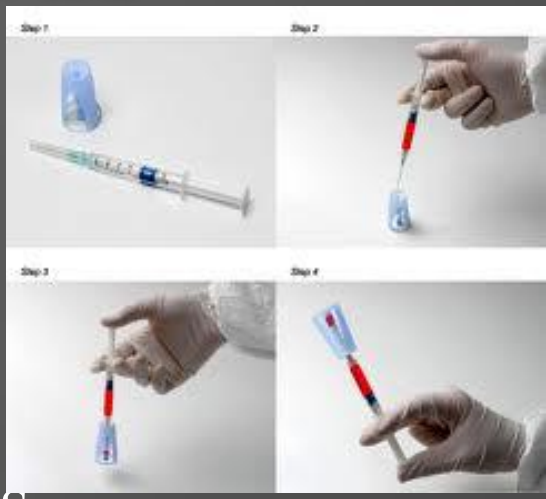
Material and methods

- Design: Educational interventional study
- Starting from October 2012, All newly graduated doctors are trained for IPC principles in their 1st year.
- 5 day training course: 2 days theoretical -3 days of practical training (small groups 5-8 at each of 7assigned hospitals
- Teaching conducted by IPC local professionals .
- Repeated every 4 months to ensure enrollment of all graduates.

Material and methods

- All participants subjected to pre-test and a post-test.
- A predesigned pre and post test was used including 4 areas:
  - personal characteristics,
  - knowledge,
  - attitude
  - perception
- Knowledge area was classified into 5 different domains:
  - Basic IPC concepts
  - Preventing the transmission of bloodborne pathogens (BPP),
  - Isolation precautions (IP)
  - Prevention of Device-Associated (DA) and Procedure-Associated (PA) infections
  - control of multi-drug resistant organisms (MRDO)

Material and methods



- **Perception was monitored using 4 questions:**

1. I feel that I know a lot about IPC principles
2. I believe that Practice of IPC guidelines does not cause an unnecessary increase in the physicians' workload
3. I think the risk of getting an infectious disease while working in healthcare setting is low
4. I think the risk of getting an infectious disease while working with sharps is high

Material and methods

- **Attitude Questions:**

1. I feel it is necessary to know infection control principles
2. I think infection control guidelines are beneficial to implement in my daily practice
3. I believe infection control guidelines improves the quality of health care
4. I believe infection control guidelines reduces health care associated infection (HAIs) in healthcare setting
5. I believe infection control guidelines reduces the cost in healthcare setting
6. I feel that risk of transmitting an infectious disease while working is low

Result

- Over 3 completed training rounds, a total of 152 newly graduate students attended the training course.

- The mean age of the total sample was 24.11±1.25 years

Personal characteristics

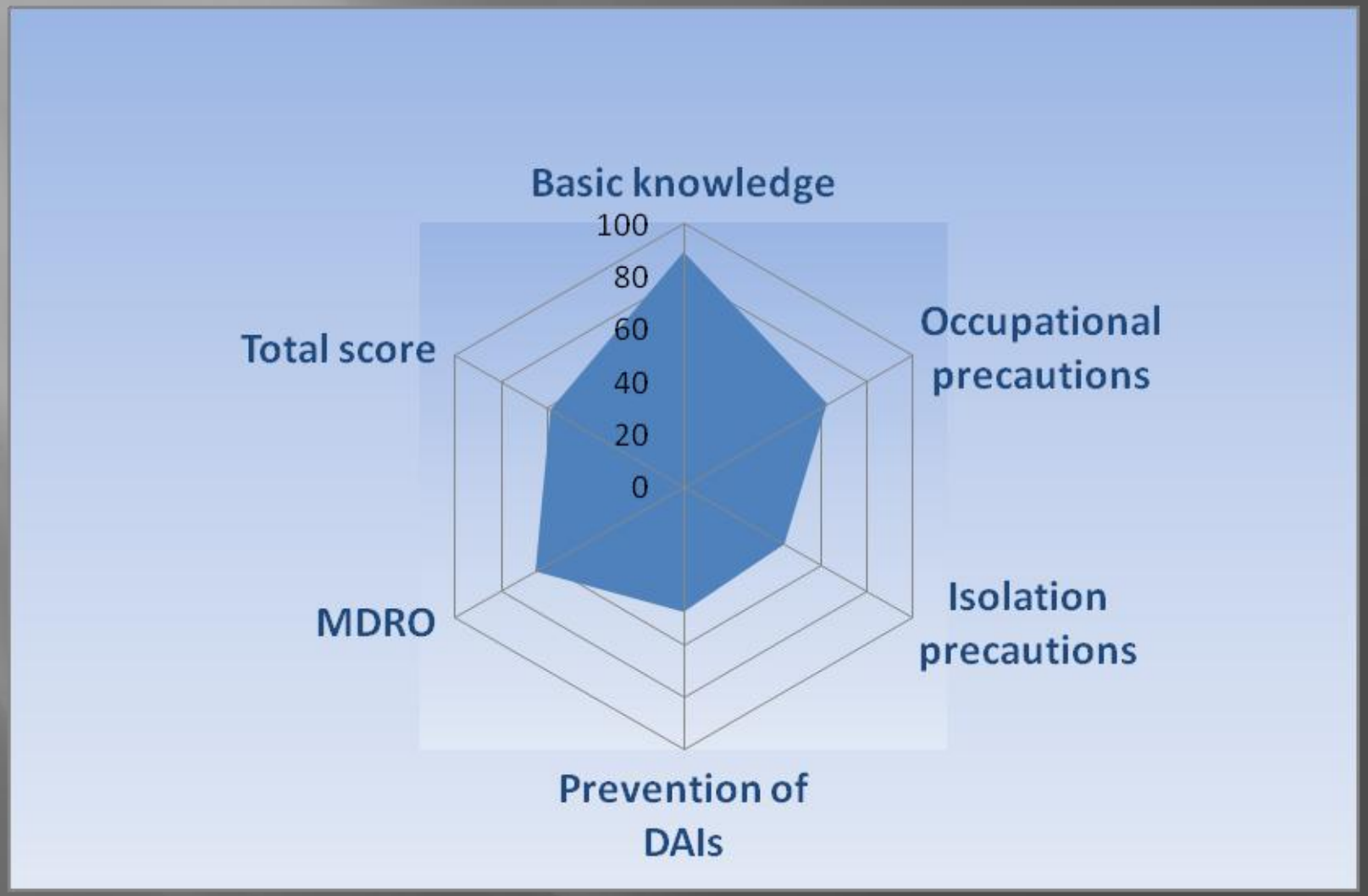
Personal characteristics	No*	%
Gender		
male	84	56.4
female	65	43.6
Grade		
fair	11	7.4
good	72	48.6
very good	54	36.5
excellent	11	7.4
Training hospital		
Mubarak	37	25.3
al Amiri	38	26.0
Farwanya	28	19.2
Sabah	14	9.6
Aladan	29	19.9
Medical school		
Kuwait	74	52.9
Others	66	47.1

Comparison of total mean % score of different knowledge domains

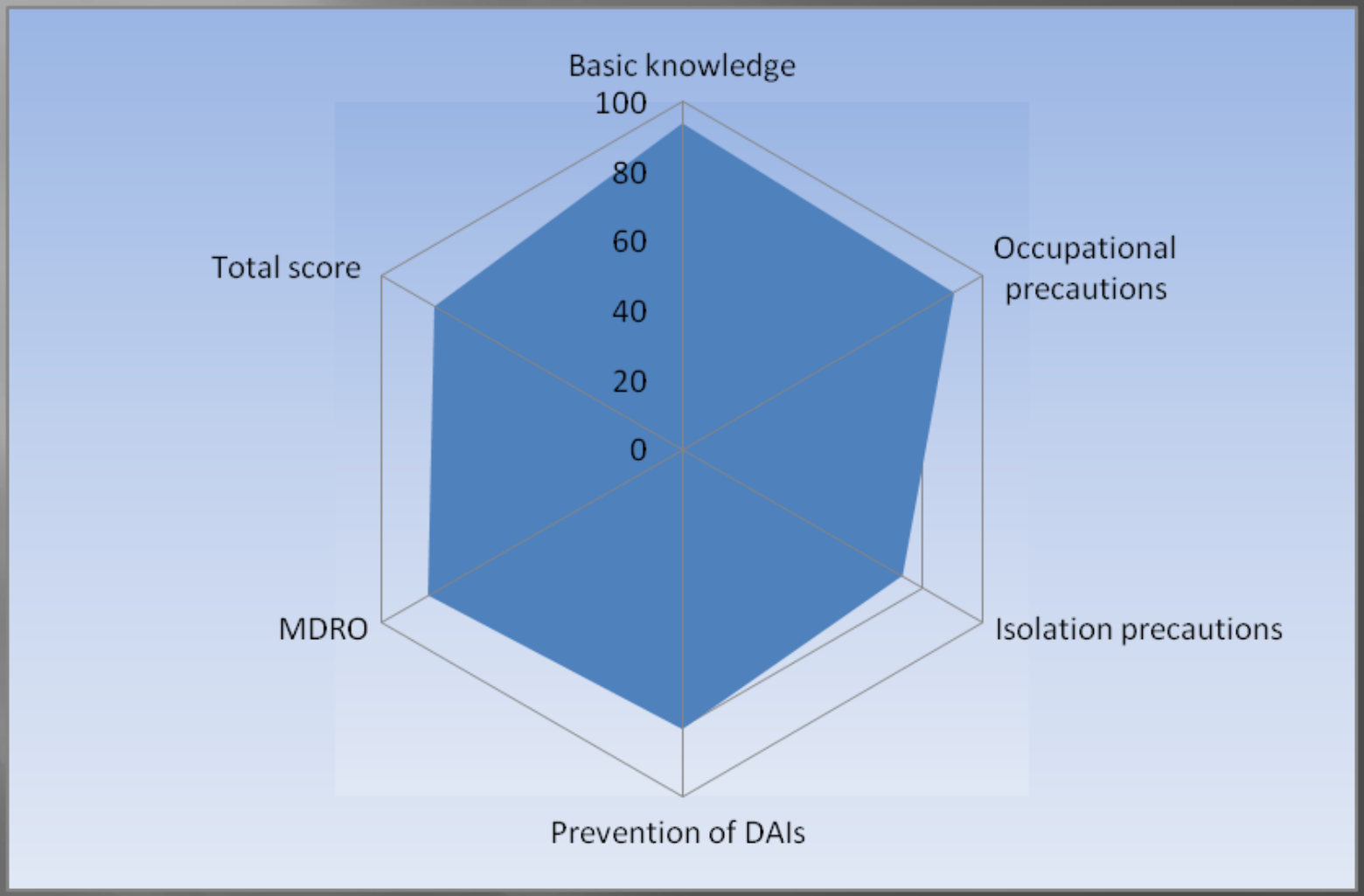
Domain	Mean score (%)	SD (%)	Significance (p) [1]
Occupational precautions(pre)	62.8	29.9	0.0001
Occupational precautions (post)	90.1	17.3	
Basic IPC[2] (pre)	88.9	17.3	0.008
Basic IPC(post)	93.9	16.4	
Isolation precautions(pre)	44.1	17.4	0.0001
Isolation precautions(post)	73.0	18.4	
Prevention of DAIs[3] (pre)	47.8	19.0	0.0001
Prevention of DAIs (post)	80.8	18.4	
MDRO[4] (pre)	64.8	17.9	0.0001
MDRO (post)	84.3	15.9	
Total score (pre)	58.2	11.6	0.0001
Total score (post)	82.2	10.9	

[1] Wicoxon Signed Ranks test
[2] Infection prevention and control
[3] DAIs (device associated infections)
[4] Multidrug resistant organisms

Mean score (%) in different knowledge domains (pre-test)



Mean score (%) in different knowledge domains (post test)



Comparison of mean knowledge % score by personal characteristics

Personal characteristics	X±SD	Significance (P)
Medical school		
Kuwait	82.1±12.1	0.524$
Others	81.5±10.2	
Grade		
Fair	85.7±10.2	0.131#
Good	80.8±11.1	
Very good	83.9±11.3	
Excellent	77.9±5.6	
Gender		
Male	80.6±11.4	0.070$
Female	84.2±10.1	

Perceptional changes before and after training course

Perception questions	% Agree (pre-test)	% Agree (post-test)	Sig#
I feel that I know a lot about infection control principles	63	97.7	0.001
I believe that Practice of infection control guidelines does not cause an unnecessary increase in the physicians' workload	92.2	97.7	0.227
I think the risk of getting an infectious disease while working in healthcare setting is low	27.3	42.7	0.013
I think risk of getting an infectious disease while working with sharps is high	94.5	97	0.180

Attitude before and after training course

Attitude questions	% Agree (pre-test)	% Agree (post-test)	Sig#
I feel it is necessary to know infection control principles	97.7	98.5	0.625
I think infection control guidelines are beneficial to implement in my daily practice	99.2	99.2	NA
I believe infection control guidelines improves the quality of health care	100	99.2	1
I believe infection control guidelines reduces health care associated infection(HAIs) in healthcare setting	100	100	NA
I believe infection control guidelines reduces the cost in healthcare setting	93.8	96.9	0.453
I feel that risk of transmitting an infectious disease while working is low	25.0	43.1	0.001

Comparison of overall mean knowledge score (%) in selected perception and attitude questions

Question	Agreement (X±SD)	Disagreement (X±SD)	Sign #
I feel that I know a lot about infection control principles	**82.4±10.9**	**80.0±6.9**	**0.525**
I think the risk of getting an infectious disease while working in healthcare setting is low	**82.6±11.2**	**82.2±10.7**	**0.758**
I feel that risk of transmitting an infectious disease while working is low	**81.6±10.2**	**82.9±11.3**	**0.295**

Conclusions

- Knowledge of IPC main principles among HCPs is often poor.
- Training in IPC is vital.
- Kuwait experience demonstrated a remarkable increase in different IPC knowledge domains. Significant improvement in knowledge related to, preventing the transmission of BBV, isolation precautions, prevention of device-associated and procedure-associated infections and the control of multi-drug resistant organisms
- The overall improvement in knowledge score filled the existing gap of knowledge that was observed prior to training.

Conclusions

- Overall or specific domain knowledge was not found as a determinant factor behind the observed significant changes in perception or attitude in our study.
- This study showed that improved level of knowledge, positive perception in medical graduate toward IPC can be obtained by well structured training program.
- The strength of our findings and the conclusions we have drawn from them need to be considered in light of possible limitations.
- To ensure patient safety, it is vital that focused, coordinated program of education, in this rapidly changing field, are prioritized and formalized into HCPs education, training and assessment in evidence-based precautions.

Thanks