

# Hand hygiene compliance rate among healthcare professionals

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## ABSTRACT

**الأهداف:** تشجيع المتخصصون في الرعاية الصحية على العناية بتنظيف أيديهم، مع التركيز على تحسين التزام الطاقم الطبي بتعقيم اليدين.

**الطريقة:** أُجريت هذه الدراسة الاستطلاعية في مستشفى حراء العام، مكة المكرمة، المملكة العربية السعودية واستمرت خلال الفترة من مايو 2009م إلى مايو 2010م. لقد تم تطبيق الأسس الأربعة التالية من أجل تحسين الالتزام بتنظيف اليدين وهي: التدقيق اليومي الذي يستدعي وجوب التقيد بتنظيف اليدين، والتنظيف الشهري للطاقم الطبي، وعقد ورشات العمل الفصلية حول وجوب تنظيف اليدين، وتوزيع المواد التعليمية. وتم تقييم معدل الالتزام بشروط النظافة على أساس مدى توافق هذا المعدل مع مجموعة من مؤشرات ودواعي النظافة.

**النتائج:** شملت هذه الدراسة 163 فرداً من الطاقم الطبي الذين أُجري عليهم المسح، وقد كان عدد الأطباء 57 طبيياً (35%)، و92 ممرض (56.4%)، و14 فني (8.6%). وقد وصل معدل الالتزام الكلي بتنظيف اليدين إلى 50.3%، وعند توزيع هذا المعدل على الطاقم كانت النسب كالتالي: 49.1% للأطباء، و52.2% للممرضين، و42.8% للفنيين. أشارت نتائج الدراسة إلى أن أعلى معدل للالتزام بشروط نظافة اليدين قد كان بين الأطباء والممرضين في قسم الجراحة، فيما انخفض هذا المعدل في الأقسام التي تستدعي الرعاية المكثفة للمرضى مثل قسم الطوارئ، وقسم العيادات الخارجية. لقد أظهرت نتائج الفنيين اختلافاً كبيراً حيث وصل معدل التزام الفنيين بتعقيم اليدين إلى 100% في الوحدات الطبية، في حين كان 0% في الوحدات السريرية الأخرى بما فيها وحدات العناية المركزة.

**خاتمة:** لقد وصل المعدل العام للالتزام الطاقم الطبي بقواعد تعقيم اليدين إلى 50% وذلك بعد تطبيق الحملات التثقيفية على فترات طويلة، وقد كان أعلى معدلات هذا الالتزام بين طاقم التمريض. ونحن نوصي بالمزيد من الدراسات لتحديد أسباب عدم الالتزام بقواعد تعقيم اليدين.

**Objectives:** To motivate healthcare professionals, with a focus on improving hand hygiene compliance.

**Methods:** An observational, prospective, longitudinal study was conducted on the evaluation of hand hygiene compliance at Hera General Hospital, Makkah, Kingdom of Saudi Arabia from May 2009 to May 2010. Four components to improve hand hygiene compliance were implied; daily audit, monthly staff education; quarterly workshops of hand hygiene, and education material distribution. The compliance rate was calculated by its adherence with number of opportunities.

**Results:** Of total 163 healthcare professionals were surveyed for hand hygiene compliance; 57 (35%) were doctors, 92 (56.4%) nurses, and 14 (8.6%) patient care technicians. The overall compliance rate was 50.3%, and its distribution among staff was as follows; doctors 49.1%, nurses 52.2%, and technicians 42.8%. The highest compliance rate among doctors and nurses was found in surgical units. A low compliance in high intensity patient care area was observed such as in the Emergency Room and out patient department. The patient care technicians showed highly variable results, as their compliance rate was 100% in medical units while 0% in various other clinical areas.

**Conclusion:** The overall hand hygiene compliance rate of healthcare professionals reached 50% after a long education campaign, and was highest among the nurses. Further study is needed to explore the reasons for non-compliance.

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Hands of healthcare professionals are regularly contaminated with pathogenic microorganisms, which are the major route of transmission of pathogens throughout the hospital environment and from the body of one patient to another. Direct contact between health care workers and patients is generally considered to be the primary route by which most of the hospital acquired infections spread within and between clinical units. Hand washing is therefore seemed to be the single most important infection control measure that can be adopted, with the continuing high infection rates generally attributed to poor hand hygiene compliance, which rarely exceeds 50% in the healthcare setting.<sup>1</sup> Therefore, this low adherence to hand hygiene remains as a major constraint in the implementation of infection control program. There are new approaches to health promotion monitoring that include direct observation, self-reporting by healthcare workers, measurement of hand hygiene product usage, and electronic methods.<sup>2</sup> No ideal method of monitoring hand hygiene compliance has been developed;<sup>3</sup> however improving hand hygiene is an essential intervention to achieve one of the patient safety goals in a healthcare setting. The objectives of the study were; 1) to motivate healthcare professionals on focussing them to implement the World Health Organization (WHO) 5 moments of hand hygiene,<sup>4</sup> 2) to evaluate the compliance of hand washing with the opportunities in clinical areas of the hospital, and 3) to discover choice of hand hygiene methods among 3 hand washing facilities available; alcohol based hand rub (ABHR), liquid ordinary soap, and liquid antimicrobial soap.

**Methods.** This observational, prospective, longitudinal study was conducted from May 2009 to May 2010 at Hera General Hospital, Makkah, Kingdom of Saudi Arabia. Three main groups of healthcare professional; doctors, nurses, and healthcare technicians were enrolled in the study. The following 4 components were implemented as multidisciplinary strategic campaign to improve compliance; 1) daily infection control audit for monitoring practices and reminders to non-adherence: A task force comprised of Infection Control Practitioners (ICP) and Nursing Health Educators was prepared to monitor the health care workers (HCW) on hand hygiene practices. At

the same time giving reminders to non-adherence; 2) Monthly staff education by lectures: A total 10 lectures for over a one year period with Continuous Medical Education accredited hours from the Saudi Council for Health Specialities were arranged during the study period. 3) Quarterly workshops of hand hygiene: The WHO Hand hygiene posters<sup>4</sup> showing hand hygiene technique and a model describing 5 moments of hand hygiene were placed in the Education Center. All staff including afternoon and night shifts were scheduled to attend the workshop. The task force visited those units where the staff cannot leave the work place, such as the intensive care unit (ICU), emergency room (ER) and operation room with decorated trolleys including gifts, chocolates and education material; 4) Hand hygiene education material distribution: The hand hygiene brochures containing all the major concerns of hand hygiene were distributed to all clinical and ancillary units. Evaluation of healthcare professionals for hand hygiene compliance rate was conducted by the survey team comprised of the representatives of ICP, nursing educators, and clinical coordinators from the Quality and Patient Safety Advocacy Department. A survey form was prepared showing the title and position of the healthcare professionals such as doctors, nurses, and patient care technicians assigned to clinical units, including electrocardiographer technicians and respiratory therapists. The opportunities for hand hygiene and the action taken by the HCW were also included in the form. A survey plan was prepared to cover all major clinical areas of the hospital. The WHO posters of 5 moments of hand hygiene were displayed, and special lectures were arranged on hand hygiene. The clinical units included in the survey were; male surgical ward (MSW), female surgical wards (FSW), male medical wards (MMW), female medical wards (FMW), pediatric ward (PW), ICU, neonatal intensive care unit (NICU), pediatric intensive care unit (PICU), labor ward (LW), out patient department (OPD), ER, obstetric main, obstetric extension 1 (OB Ext 1), and obstetric extension 2. The criterion of inclusion of opportunity in all clinical units was; before touching the patients, before aseptic task, contact with body fluids or excretion, after patient contact, and after contact with patient's surroundings. The opportunities for hand hygiene other than above, such as hand washing after removing gloves, and so on were excluded from the study. Hand hygiene performed by the healthcare professional either with liquid soap, alcohol based hand rub, or antimicrobial soap used in clinical practice was considered in the inclusion criteria. Highlighting the correct method of hand hygiene was not an aim of this study. Availability of hand hygiene material was insured prior to the survey. Monitoring

**Disclosure.** No finance was required for this study as it was an observational study by the Infection Control Team of the hospital. The hand hygiene material used was readily available at the point of care.

**Table 1** - Unit wise distribution of hand hygiene compliance rates in percent (%) among Hera General Hospital staff, doctor, nurses, and patient care technicians.

Hospital units	Doctors	Nurses	Patient care technicians
Intensive Care Unit	63.6	47.0	0.0
Neonatal Intensive Care Unit	50.0	58.3	50.0
Pediatric Intensive Care Unit	0.0	50.0	0.0
Male Medical Ward	25.0	42.8	50.0
Female Medical Ward	50.0	44.4	100
Male Surgical Ward	33.3	81.8	0.0
Female Surgical Ward	100	71.4	0.0
Pediatric Ward	0.0	66.7	0.0
Labor Ward	100	75.0	0.0
Obstetric Extension 1	0.0	0.0	0.0
Obstetric Extension 2	0.0	25.0	0.0
Obstetric Main	60.0	72.7	0.0
Out patient Department	37.5	50.0	50.0
Emergency Department	20.0	60.0	50.0

was carried out without the knowledge of the healthcare personnel. The compliance rate was calculated using the following formula; number of times hand hygiene was performed divided by number of observed hand hygiene indications (opportunities); multiplied by 100.

The data collection and interpretation were carried out on a Personal Computer. The Statistical Package for Social Sciences version 10.0 (SPSS Inc, Chicago, IL, USA) was used to analyze the data. A  $p$ -value of  $<0.05$  was considered as statistically significant.

**Results.** Of 163 healthcare professionals surveyed; 57 (35%) were doctors, 92 (56.4%) were nurses, and 14 (8.6%) technicians. There was a total of 1,023 opportunities for hand hygiene, and the overall compliance rate was 50.3%. The individual staff category compliance rate was as follows; doctors 49.1%, nurses 52.2%, and technicians assigned in clinical area 42.8%. Results were statistically significant when the groups were compared: doctors versus nurse's opportunities (for hand hygiene adhered [ $p=0.021$ ] and doctors versus patient care technicians (opportunities not adhered [ $p=0.001$ ]), and nurses versus technicians (opportunities for hand hygiene adhered [ $p=0.009$ ]). The unit wise distribution of compliance rates among HCW-doctors, nurses, and patient care technicians is described in Table 1. The highest compliance rate among doctors was found in the FSW and LW (100%) while among nurses the highest rate was found in MSW (81.8%). The patient care technicians showed highly variable results as their compliance rate was 100% in FMW while 0% in various other units like ICU, PICU, MSW, FSW, PW, LW, and OB Ext 1. The preferred choice for hand hygiene among healthcare professional was ABHR (74.5%), followed by soap and water (23.4%), and antimicrobial soap (2.1%).

**Discussion.** There has been no universally accepted method of measuring compliance to date and the methods described in the past were too complex.<sup>5</sup> We followed the Centre for Diseases control, and Prevention (CDC) guideline for hand hygiene in health-care settings.<sup>5</sup> The adherence of HCW to good hand hygiene practices is necessary during all aspects of patient care, but hand washing before touching the patient was a part of global participation in this study. Hand hygiene among HCW is low, and there is still much room for improvement to ensure that patients remain free from healthcare associated infections (HAI). In addition, this study was focused on increasing awareness among our healthcare givers, which is one of the 6 golden rules to improve compliance in hand hygiene.<sup>5</sup> Hand hygiene prevents cross infection in the hospitals and play a major role in reduction of HAI.<sup>6</sup> It is the patient's right to obtain safe, and infection free care in the hospital, and compliance of all preventive measures adopted by the HCW should be 100%, however, in our study the overall hand hygiene compliance rate was observed as 50.3%. On other hand, on literature review we found the compliance rate in our study is higher than the various international studies<sup>7-9</sup> and very low from the national hand hygiene compliance rate of the United Kingdom.<sup>10</sup> Interestingly our compliance rate was very high in comparison to one local study,<sup>11</sup> where the overall frequency of hand washing before patient's contact was reported as 6.7%.

Although some of our previous interventions to improve compliance have been successful to some extent, none has achieved a lasting improvement. It is important to mention that the current compliance rate gained after a long hand hygiene campaign was also supported by 2 strong interventions in our hospital; firstly, the continuous external infection control audit by highly qualified experts in the field of infection control,<sup>12</sup> secondly the infection control certification program. The infection control certification program comprised of training sessions for all hospital employees initially, and later review of the infection control guide, which was provided to all HCWs. A HCW has to pass a computerized examination, which is organized by the Education Center every Tuesday between 2-3 pm when he/she feels fully prepared for evaluation. A failure has to repeat until passing the examination. An Infection Control Certificate is issued to all successful HCW's, which remains valid for 2 years. This certificate is mandatory for promotion and annual increment at the time of renewal of contract.

We have further analyzed our overall compliance rate among the 3 major staff categories; the doctors, nurses, and patient care technicians. Our nurses remained at the top of hand hygiene performance, which is comparable

to the studies conducted locally,<sup>11</sup> and internationally.<sup>13</sup> In intensive care unit, the situation was different from the above because the overall compliance rate among doctors was higher than the nurses and technicians. It indicates that only ICU doctors were found more careful to the patients in performing hand hygiene as compared to their colleague nurses and technicians. This fact was also observed in another local study<sup>14</sup> where they also proved that the ICU physician's performance remained better than the nurses. A similar high compliance rate of physicians was also noted in surgical units in contrast to the statement published in a review article.<sup>15</sup> In the Emergency (ER) and OPD, the hand hygiene compliance remained poor; this can be explained due to rapid turn over of patients.

The hand hygiene compliance rate among our patient care technicians was found lowest in contrast to other similar studies.<sup>14,16</sup> This group of healthcare worker was found inconsistent to hand hygiene as their performance remained best in medical units (MMW and FMW) while very poor in all other clinical units including the ICUs. This observation was further analyzed, and it was found that the patient care technicians showed poor attendance in all infection control education and awareness activities. This group of HCWs needs greater attention to all future infection control-training sessions.

A multidisciplinary approach, with reinforcement and education can improve the modest adherence to hand hygiene. Therefore, hospitals need to develop and implement innovative educational and motivational programs adapted to specific groups of health personnel to improve hand hygiene compliance. As per the Joint Commission International (JCI) standard,<sup>17</sup> the successful quality improvement means; an organization makes such improvements sustainable; therefore all our efforts were focused on improving hand hygiene on the 5 moments at the point of care. It is also documented that strict compliance of healthcare professionals to recommended hand hygiene practices is very difficult to achieve, and even when it is achieved it is very difficult to sustain,<sup>10</sup> however, it is not difficult at the place of current study because the organization is under the process of JCI accreditation.

In conclusion, the overall hand hygiene compliance rate of healthcare professionals was above 50%, gained after a long educational campaign. We are unable to declare whether the rate found in this study is good or bad due to the lack of a national and international bench marking system.

We recommend registering all government hospitals in the Kingdom of Saudi Arabia to develop national compliance rates, which can be used as a bench mark of the hand hygiene compliance rate of an individual

hospital. More research is required to investigate problems associated with hand hygiene, to identify the reasons for non-compliance, and to design interventions to improve compliance.

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## Supplements

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