Personal hygiene and safety of governmental hospital staff in Shiraz, Islamic Republic of Iran

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النظافة الشخصية والسلامة بين العاملين بالمستشفيات الحكومية، في مدينة شيراز الإيرانية

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الخلاصة: يمثل الالتزام بمعايير مكافحة العدوى عنصراً أساسياً لاتِّقاء العدوى المكتسبة في المستشفيات. وقد كان الغرض من هذه الدراسة هو تحديد الممارسات المتعلقة بالنظافة الشخصية بين العاملين الصحيين، ومدى التزامهم بالتعليمات الموصى بها في هذا الشأن، وذلك في جميع المستشفيات الثلاثين التابعة لجامعة شيراز للعلوم الطبية. وأظهرت نتائج الدراسة أن الأطباء والممرضات أقل التزاماً بممارسات النظافة الشخصية بالمقارنة مع عمَّال التنظيف. كما أن التدابير الوقائية كانت تُراعى في المستشفيات التعليمية بشكل أفضل من المستشفيات غير التعليمية، وكذلك كان الحال بالنسبة لمعدلات التطعيم (ضد التهاب الكبد الوبائي "بي" والكزاز/الخناق)، مع تحقيق الأطباء لأعلى الأحراز. ومن ثم فإن هناك حاجة إلى اتخاذ التدابير اللازمة للارتقاء بالتزام العاملين الصحيين في هذا المجال.

ABSTRACT Complying with infection control standards is essential to prevent nosocomial infections. We aimed to determine health workers' hygiene practices and compliance with recommended instructions for personal hygiene among staff in all 30 hospitals affiliated to Shiraz University of Medical Sciences. The results showed that physicians and nurses were less compliant with personal hygiene practices than cleaners. Availability of protective measures was better in teaching hospitals than non-teaching hospitals as were vaccination rates among staff (hepatitis B and tetanus/diphtheria) with physicians scoring highest. Measures are needed to improve health workers' compliance.

L'hygiène personnelle et la sécurité du personnel des hôpitaux publics à Chiraz (République islamique d'Iran)

RÉSUMÉ Le respect des normes de lutte contre les infections est essentiel pour la prévention des infections nosocomiales. Notre objectif était de déterminer les pratiques d'hygiène des agents de santé et le respect par ces derniers des prescriptions d'hygiène personnelle parmi le personnel de l'ensemble des 30 hôpitaux rattachés à l'Université des Sciences médicales de Chiraz. Les résultats ont montré que les médecins et les infirmières respectaient moins l'hygiène personnelle que les agents de nettoyage. La disponibilité de mesures de protection était meilleure dans les hôpitaux universitaires que dans les hôpitaux non universitaires, tout comme les taux de vaccination parmi le personnel (hépatite B et tétanos/diphtérie), les médecins ayant le score le plus élevé. Des mesures sont nécessaires pour améliorer le respect de ces normes par les agents de santé.

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Introduction

Nosocomial infections have been recognized for 150 years but they remain a hazard to both health workers and patients [*1*].

In the Islamic Republic of Iran there is increased awareness of the importance of hospital-acquired infections and the need to allocate more financial resources to infection control programmes [*2–4*]. However, there are no regular infection control teaching or surveillance programmes in the country. There have only been a series of lectures and workshops that the Department of Community Medicine of the Shiraz University have undertaken on different areas of infection control at the province and national levels which are now being expanded throughout the country.

The incidence of human immunodeficiency virus (HIV) infection in the Islamic Republic of Iran is increasing, especially among intravenous drug abusers [*5*]. The incidence of hepatitis B infection ranges between 1.75% and 5.0% and that of hepatitis C between 0.2% and 1.5% in different parts of the country [*6*]. These data indicate the necessity for local studies about the nosocomial infection control standards [*7*].

Many studies have been carried out throughout the world [*8–10*] about nosocomial infection that indicate a lack of attention to nosocomial infection control standards in different countries. We aimed to study the personal hygiene practices of heath care workers (HCWs) and the staff safety measures in place in all government teaching and non-teaching hospitals in Fars province. Our objective was to identify areas of negligence which could lead to transmission of noscomial infections.

Methods

This study was carried out with the cooperation of Central Committee of Nosocomial Infection of Fars province. All hospitals (13 teaching and 17 non-teaching) government hospitals affiliated to Shiraz University of Medical Sciences were included in the study which was conducted from April to the end of June 2001. Data were collected through 2 checklists, which were prepared with the reference to established guidelines [*11,12*]. The checklists were piloted tested in 3 different hospitals by trained nurses to detect any misunderstandings and problems and modified accordingly. The checklists are shown in Tables 1 and 2. These checklists were completed for all health care workers (HCWs) in all wards and services of the selected hospitals. This included 2134 doctors, 8986 nurses and 1236 hospital cleaners. A total of 30 trainee infection control nurses were trained in a 3-day workshop on how to observe HCWs and complete the checklists with consistency: they then completed 10 068 checklists. Data were missing for 2288 staff members because they were absent on the days of observation. As a quality check, the Central Committee of Nosocomial Infection Prevention rechecked 20% of the checklists in all hospital wards and services. If there was a more than 10% difference between Committee reports and data recorded by the trainee nurses, they were retrained and they completed the checklists accompanied by one of the researchers the next time.

The data were entered into software specifically developed for the study by the first author. Data analysis was done using this software. In yes/no questions, the propor-

Table 1 Checklist for assessment of personal hygiene practices among health care workers

Practice
Assessed for physicians and nurses
1. Use uniform according to hospital policy.
2. Uniforms are clean.
3. Use proper shoes (not slippers).
4. Have short fingernails.
5. Do not wear jewellery (rings/bracelets).
6. Use needle-cutter or specific container to discard used syringes, needles and other sharp items.
7. Wash hands after each step of working.
8. Wash hands after contact with patients.
9. Wear gloves when needed.
10. Use protective devices (gown, mask, gloves and goggles) when in contact with infectious patients or if there is possibility of splashing blood or other drainages.
11. Use protective measures if drawing blood (gloves, masks and goggles).
Assessed for hospital cleaners
1. Use black-coloured gloves for cleaning of toilets and different-coloured gloves for other sites.
2. Wear boots when washing the ward.
3. Wear rubber aprons when washing the ward.

tion of positive answers was calculated and multiplied by 100, giving scores between 0 to 100. The results were analysed according to job (doctor, nurse and hospital cleaner). Scores of 80–100, 61–79 and ≤ 60 were considered: good, fair and poor respectively.

Table 2 Checklist for assessment of vaccination status and availability of protective devices among health care workers

Measure
1. Tetanus and diphtheria vaccination complete and up to date (3 shots and a booster every 10 years).
2. Hepatitis B vaccination complete (3 times).
3. Shampoo, soap and towels available for personnel to take a bath.
4. Proper uniform supplied for personnel twice a year.
5. Rubber aprons available if necessary.
6. Long boots available if necessary.
7. Adequate number of gloves available for the personnel.

Results

Distribution of scores for personal hygiene practices according to job and type of hospital is shown in Table 3. For personal hygiene practices, fewer physicians had good scores (10%) than nurses (32.2%) and hospital cleaners (56.7%). In fact the majority of doctors (67.7%) and nurses (64.6%) achieved a fair score. Nurses in teaching hospitals scored higher than those in non-teaching hospitals. As regards the availability of/access to protective measures for HCWs, physicians and nurses were better provided for or immunized than hospital cleaners where 70% of hospital cleaners in all hospitals did not have sufficient protective measures in place (Table 4). The mean (standard deviation) of personal hygiene scores for physicians in teaching hospitals was 69 (11.0), in non-teaching hospitals it was 69 (12.8) and all hospitals it was 69 (11.9). The scores for nurses in teaching, non-teaching and all hospitals were 79 (10.7), 75 (8.6) and 77 (9.6) respectively and for hospital cleaners in teaching, non-teaching and all hospitals the scores were 18 (3.4), 78 (10.6) and 79 (11.2) respectively.

The mean (standard deviation) scores of vaccination and access to protective measures were 73 (19.6), 75 (72.0), 74 (22.8) for physicians, and 70 (62.0), 67 (15.0) and 68 (20.0) for nurses and 51 (43.8), 34 (29.0), and 43 (29.5) for hospital cleaners for all wards of teaching, non-teaching and all hospitals respectively.

Discussion

Nosocomial infection control is important for 3 main reasons: 1) to prevent spread of infections from patients to HCWs and vice versa, 2) to prevent bacterial resistance and 3) to avoid waste of financial resources [*13,14*]. Transmission of nosocomial infections in hospitals can occur in 3 ways: patient to patient, patient to HCW and HCW to patients [*15*]. A major reason for transmission of microorganisms is because of lack of personal hygiene in HCWs, especially improper hand washing, disposal of sharp instruments and use of personal protective devices, such as gloves and masks [*16–21*]. Hence we looked at the personal hygiene practices of HCWs and their vaccination

Table 3 Scores for personal hygiene practices among health care workers in government hospitals according to job

Job category	Type of hospital	% scoring		
		80–100	61–79	≤ 60
Physician	Teaching	7.6	77.2	15.2
	Non-teaching	11.8	76.3	11.8
	All hospitals	10.0	67.7	13.3
Nurse	Teaching	46.5	53.5	0.0
	Non-teaching	22.5	72.0	5.5
	All hospitals	32.2	64.6	3.2
Hospital cleaner	Teaching	61.5	30.8	7.7
	Non-teaching	52.9	41.2	5.9
	All hospitals	56.7	36.7	6.6

80–100 = good; 61–79 = fair; ≤ 60 = poor.

Table 4 Scores for compliance with standards for personnel protection in governmental hospitals according to job

Job category	Type of hospital	% scoring		
		80–100	61–79	≤ 60
Physician	Teaching	61.5	7.7	30.8
	Non-teaching	35.3	47.1	17.6
	All hospitals	46.7	30.0	23.3
Nurse	Teaching	46.1	7.8	46.1
	Non-teaching	22.2	44.5	33.3
	All hospitals	32.2	29.1	38.7
Hospital cleaner	Teaching	36.6	7.4	56.0
	Non-teaching	5.9	11.8	82.3
	All hospitals	20.0	10.0	70.0

80–100 = good; 61–79 = fair; ≤ 60 = poor.

status and access to protective measures in Fars government hospitals.

Considering personal hygiene practices, only 10% of physicians in all hospitals achieved a good score with more doctors in non-teaching hospitals scoring better. Teaching hospitals are where medical students acquire scientific and clinical knowledge and practices. If examples set by doctors in such hospitals are unsatisfactory, this may lead to improper practices among the students who are the future doctors.

As shown in Table 3, the personal hygiene practices of nurses and hospital cleaners in teaching hospitals were better than in non-teaching ones. More importantly, more cleaners had good scores than both nurses and doctors (Table 3). This was wholly unexpected because physicians and nurses should have greater knowledge about the dangers of nosocomial infection and would therefore be expected to have the higher scores. However, other studies have shown that physicians, compared to nurses, are less likely to follow personal hygiene regulations [*22*]. Another study showed that physicians in all categories neglected hand washing before, after and between patient physical examination [*23*].

Research has indicated that it is necessary to supply enough resources (liquid soap, paper towels, gloves, masks, etc.) to encourage HCWs to comply with hygiene standards [*24*]. Furthermore, instructions about infection control should be given according to job category and level of knowledge. Review of personal hygiene practices and standards annually and encouraging feedback from HCWs are also recommended [*24*].

As regards immunization and access to protective measures, teaching hospitals scored better than non-teaching hospitals. In this regard less than half of HCWs achieved good scores indicating lack of adequate protection, and hospital cleaners were the least well protected (Table 4). Among 2125 surgeons in England, 38%–50% were not vaccinated against hepatitis B [*25*].

It would appear from our study that HCWs and patients in our hospitals are at risk to acquire nosocomial infections

because of non-adherence of HCWs to infection control standards. This may lead to high mortality and morbidity rates as well as increasing the financial costs. Therefore, future education about infection control issues must be focused on HCWs and stress the need to improve the facilities to allow adherence to infection control policies. Finally, other studies are recommended to elucidate the reasons for non-compliance with infection control measures and the level of knowledge, attitude and practice regarding infection control isolation precautions.

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