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Major Article

Prevention and control of health care–associated infections in Iran: A qualitative study to explore challenges and barriers

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Background: Globally, the health and economic burden posed by health care–associated infections (HAIs) remains wide and severe. To curb the burden associated with HAIs, countries, including Iran, aim at HAI prevention and control. This study explores the challenges faced by the Iranian health system in addressing the issues associated with the prevention and control of HAIs.

Methods: A qualitative research method was adopted in exploring the phenomenon. We used the purposive sampling approach in reaching 24 key informants at the national and subnational levels. The thematic framework analysis was conducted for analyzing the interviews.

Results: Five main themes emerged from our study demonstrating the obstacles toward the prevention and control of HAIs. They include governance and stewardship, resources, safety culture, monitoring and surveillance systems, and inappropriate prescription of antibiotics.

Conclusions: Strengthening of reporting and surveillance systems for HAIs coupled with proper governance and stewardship are crucial in order to improve the health and safety of patients. However, the availability of resources, through an intersectoral approach, is essential to achieve sustained output.

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Health care–associated infections (HAIs) are infections that patients acquire after 48 hours of admission to a health care facility.¹ HAIs are very common, and a significant proportion of them are preventable.² In U.S. hospitals, approximately 1.7 million HAIs occurred in 2002 and approximately 99,000 patients died as the result of HAIs.³ HAIs are, therefore, a serious threat to patients and a major drain on health care resources.^{1,4–9} It is estimated that approximately \$9.8 billion is spent annually on HAIs,⁴ and \$25–\$31.5 billion can be saved if 70% of HAIs are prevented.¹⁰ The notion of HAIs is very complicated and multifactorial; therefore, their control needs complex and multidisciplinary solutions. It is argued that the main causes of HAIs are weak surveillance systems, lack of knowledge and attitudes of health professionals, cultural factors, flaws within

the health care systems, limited resources, and legal and political constraints.^{11–14}

A recent report has shown that a significant proportion of patients have developed HAIs in Iranian hospitals between 2007 and 2010, and 14.8% of these patients have died as a result of HAIs.¹⁵ The exact burden and nature of HAIs, however, have not been well documented in Iran and other developing countries. The ultimate goal of any HAI control initiative is to improve patients' health and prevent death and adverse outcomes.^{9,16,17} In Iran in 2007, a national reporting and surveillance system was specifically designed to report and control HAIs. These initiatives however seem to have been faced with many difficulties and challenges. This study aimed to explore the challenges regarding the prevention and control of HAIs faced by the Iranian health system as a developing country.

METHODS

Study design, sampling, and data collection

In Iran, the Ministry of Health and Medical Education (MOHME) is the main institution responsible for provision of health care services, medical education, research, and supervision and regulations.

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All of the public Universities of Medical Sciences (UMS) are affiliated with the MOHME, and the public educational hospitals are affiliated with the UMS.¹⁸ Therefore, the MOHME, UMS, and hospitals are responsible for the control of HAIs at the macro, meso, and micro levels, respectively.

We used a qualitative design with a purposive sampling approach to interview experts (policymakers, technical officers, and hospital directors) from the National Committee of Hospital Infections and other sections in the MOHME, UMS, and private and public hospitals.

A total of 24 semi-structured interviews were conducted between June 2014 and April 2015, including 10 interviews from the MOHME, 7 from UMS, and 7 from hospitals. Each interview lasted 45–120 minutes. Interviews were tape-recorded and transcribed; however, 2 participants were unwilling to have their voices taped; therefore, their conversations were written. Interview questions covered the subjects of resources (human, financial, and materials resources); environmental, cultural, institutional, legal, educational, and pharmaceutical issues; and their contributions toward prevention and control of HAIs. The interview guide was first pretested with 2 participants to ensure its validity. The questions did not differ across the interviewees.

Data analysis

Thematic framework analysis was conducted using MAXQDA 10 software (VERBI Software; Udo Kuckartz, Berlin, Germany). The authors (A.E. and H.S.) transcribed the data in Farsi language and translated them into English. We adopted the framework approach to analyze the data by using the following steps: familiarization, identification of thematic framework, indexing, charting, and mapping and interpretation.^{19,20} The World Health Organization's Health Systems Framework^{21,22} was used as a guide for the analysis and interpretation of the data.

The authors (A.E. and H.S.) listened to the audiotapes and read the transcripts repeatedly to be sufficiently familiar with the data and have a general overview of it. The data that were associated

with the codes and were relevant to the research objectives were discussed and compared. The research team then entered the data, including themes and subthemes, into the relevant charts. Finally, we selected and analyzed the core themes.

We also ensured the trustworthiness of interviews, including credibility, transferability, dependability, and confirmability,^{18,23} as follows: member checks and prolonged engagement were adopted to enhance the credibility of our findings. The purposive sampling technique and detailed descriptions ensured that any vague statements were avoided, thereby enhancing the transferability of our findings. Moreover, we applied 3 strategies: data checks, detailed documentation, and used external audit in ensuring the dependability and confirmability of our findings.

Ethical considerations

This study was approved by the Ethics Committee of the Deputy of Research and Technology of Tehran University of Medical Sciences with the Ethical Approval Code: IR.TUMS.REC.1395.2617. We also obtained informed consent from all the participants and assured their anonymity.

RESULTS

The following 5 main themes (challenges) were emerged from our data (Table 1).

Governance and stewardship

Most of our interviewees repeatedly stated the lack of a specific national infection control division as an important challenge hindering the control of HAIs. The primary stewardship in charge of the infection surveillance system is the Office of Communicable Diseases Control in Health Deputy at the MOHME. However, issues regarding patients' safety, treatments, and evaluation are supervised by the deputy of curative affairs within the MOHME.

Table 1
Challenges toward prevention and control of HAIs in Iran, 2015

Themes	Subthemes	Codes
Theme 1: Governance and stewardship	Stewardship	Lack of a national stewardship Poor intersectoral collaboration
	Evidence-based policymaking	Lack of local clinical guidelines Lack of standards of care
	Priority setting	Prevention and control of HAIs not prioritized at the national level
Theme 2: Resources	Human resources	Shortage of medical staff Inadequate training programs Inadequate research activities
	Financial and material resources	Low level of knowledge and awareness Limited budget No financial support Inadequate provision of equipment and facilities Low-quality materials
	Cultivating a negative culture	Nonpractice of handwashing by those who are supposedly assumed to have high level of knowledge regarding the control of HAIs (eg, supervisors) Poor attitudes of supervisors toward hand hygiene
Theme 3: Safety culture		Lack of supportive environment to discuss medical errors (eg, HAIs)
Theme 4: Monitoring and surveillance systems	Reporting system	Lack of comprehensive information system Underreporting
Theme 5: Prescription of antibiotics	Postdischarge surveillance system	Lack of follow-up system
	Antibiotic surveillance system	Lack of systems to monitor antibiotic prescribed by physicians Inability to control physicians regarding prescription of antibiotics
	Antimicrobial resistance	Overuse of antibiotics Misuse of antibiotics No consultation before prescription

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