

From Prevention to Care: The Crucial Role of Physicians, Nursing, Laboratory Services, Health Administration, and Emergency Medical Services in Infection Control

Faten Mohammed Islam Khotany¹, Feryal Mohammed Islam², Amirah Hamed Jaber Alharthi³, Abdulaziz M Islam Khotani⁴, Shuruq Iqal Al Nadwi⁵, Ghadeer H. Alhazmi⁶, Duaa M. Mandeeli⁷, Amal H. Almuwalled⁸, Fawziah Adam Hawsawi⁹, Mahacen Egal Al Nadwi¹⁰, Fardus Mohammed Islam Khawtani¹¹, Laila Hussien Hakami¹²

¹Senior Nursing Specialist, Maternity and Children Hospital

²Nursing Technician, Executive Administration of Combating Infectious Diseases and Disease Vectors

³Senior Specialist, Health Administration, Maternity and Children Hospital

⁴Emergency Medical Services, Maternity and Children Hospital

⁵Laboratory Specialist, Alkakyah PHC

⁶Laboratory and Blood Bank Department, Maternity and Children Hospital, Makkah, Saudi Arabia

⁷Laboratory Specialist, Maternity and Children Hospital

⁸Med. Labs. Technician, King Fahad Medical City

⁹Med, Labs, Technician, Maternity and Children Hospital

¹⁰Physician, Taif Children Hospital

¹¹Specialist, Food and Nutrition, Maternity and Children Hospital

¹²Senior Specialist, Jazan Specialized Hospital

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ABSTRACT

Introduction: Infection prevention and control is an important component of healthcare delivery that seeks to prevent and contain spread of infectious diseases in healthcare facilities. Infection control interventions involve collaboration of physicians, nurses, laboratory, health administrative and the emergency medical services. All the professions provide different skills and knowledge required in the early detection, control and handling of infections within health care settings.

Aim of work: To provide a comprehensive understanding of the crucial role of physicians, nursing, laboratory services, health administration, and emergency medical services in infection control

Methods: We conducted a comprehensive search in the MEDLINE database's electronic literature using the following search terms: Role, Physicians, Nursing, Laboratory Services, Health Administration, Emergency Medical Services and Infection Control. The search was restricted to publications from 2016 to 2024 in order to locate relevant content. We performed a search on Google Scholar to locate and examine academic papers that pertain to my subject matter. The selection of articles was impacted by certain criteria for inclusion.

Results: The publications analyzed in this study encompassed from 2016 to 2024. The study was structured into various sections with specific headings in the discussion section.

Conclusion: Engaging physicians, nurses, laboratory services, health administrators as well as EMS providers, optimizes infection control in the healthcare system. These professionals are joined together in interdisciplinary infection control committees where they get to discuss new trends, problems and ways of dealing with them. Such an environment leads to the integration of infectious prevention, in which clinical, administrative, and laboratory knowledge is aligned with frontline practicality, flexibility, and adaptability. Both professions contribute to healthcare systems in their own ways and knowledge, practices from both, help to reduce infection hazards significantly. In this way, these healthcare professionals guarantee an effective infection control system, and therefore healthy patient populations – overall, the public.

Keywords: Role, Physicians, Nursing, Laboratory Services, Health Administration, Emergency Medical Services and Infection Control

INTRODUCTION

Infection prevention and control is the protection against communication of communicable diseases within the healthcare facilities. According to the World Health Organization (WHO) working definition, infection control

meant a “scientific approach and practical solution to the problem of infection that is capable of inflicting harm to the patient and health care workers” (World Health Organization, 2020). Infection control measures require a comprehensive and coordinated intervention of physicians, nurses, medical laboratory and pathology, health administrators, and EMS. Some of the roles of health practitioners and professionals include the promotion of specialty skills that round off the prevention of infection in various settings (Almutairi et al., 2023).

Doctors are involved in the decisions of diagnosing of the diseases, the appropriate treatment and supervision of the control of infections. They also participate in providing advocacy on healthcare teams’ practice and antibiotic stewardship for the avoidance of the formation of drug-resistant pathogens (Ha et al., 2019). Preliminary isolation of such cases by physicians allow avoidance of widespread cases within health facilities, thus offer patient safety as well as health care workers. Moreover, they engage in constant education and policy making that fosters good infection prevention practices that are relevant in today’s health practice (Schutte et al., 2024).

Frontline workers especially nurses are in a direct interaction with the patients and hence they can easily be a medium through which ICPs like hand washing, wearing of PPE and the environmental cleaning practices are executed. Apart from attending directly to patients’ needs, nursing staff are expected to assess patients for infection, report to the physician when they detect signs of infection and teach patients and their families on the prevention of infection. They are an active part of infection surveillance and participation in numerous control measures are essential to ensure free safe environments in health facilities to minimize instances of nosocomial infections (Valle et al., 2016).

Laboratory plays a central role in early detection of the infection causing agents, which is very essential in combating infections. Hospitals and clinics assistance in infection control through speedy and correct identification of tests to enable in treatment and isolation procedures (Binnicker, 2020). As molecular diagnostics, laboratories are able to identify new pathogens and monitor AMR’s at the site of care, thereby informing infection prevention and control interventions. Other care givers may also consult laboratory professionals on how best to take samples and transport them to the laboratory to avoid contamination thereby preserving the integrity of diagnostic results (Centers for Disease Control and Prevention, 2019).

Health administration is typically charged with the responsibility of designing, promulgating and overseeing the compliance to standard measures against the spread of infections within health facilities. Management makes sure that important resources, including personal protective equipment, are available and that workers are trained in measures of preventing infection. They are necessary for matters concerning the safety culture, the adherence to and compliance to infection control measures and regulatory response (Shang et al., 2020). This way, the health administrators help a lot in addressing the need of infrastructure and quality improvement training and implementing ongoing infection prevention measures that leads to lower infection rates as well as improved patient outcomes.

EMS is one of the introductory commodities in health care especially during infectious diseases outbreaks. EMS personnel require to use appropriate measures against infectious agents by wearing personal protective equipment and decontaminating equipment, together with patients’ transport (Jenkins et al., 2022). Since EMS works in inconceivably unstable and sometimes unsterilized settings, the services demand on-the-fly approaches to infection control that brings as little threat to both clients and the receiving healthcare institutions as possible. Vaccination, training and compliance to standard infection prevention measures to prevent highly transmissible diseases is also aspect of infection control in EMS (Jenkins et al., 2023).

AIM OF WORK

To provide a comprehensive understanding of the crucial role of physicians, nursing, laboratory services, health administration, and emergency medical services in infection control

METHODS

A comprehensive search was conducted on recognized scientific platforms, including Google Scholar and Pubmed, using specific keywords such as Role, Physicians, Nursing, Laboratory Services, Health Administration, Emergency Medical Services and Infection Control. The aim was to gather all relevant research papers. The articles were chosen according to certain criteria. Upon conducting a comprehensive analysis of the abstracts and notable titles of each publication, we eliminated case reports, duplicate articles, and publications without full information. The reviews included in this research were published from 2016 to 2024.

RESULTS

The current investigation concentrated on the crucial role of physicians, nursing, laboratory services, health administration, and emergency medical services in infection control between 2016 and 2024. As a result, the review was published under many headlines in the discussion area, including: Role of Physicians in Infection Control, Nursing and Infection Control, Contribution of Laboratory Services to Infection Control, Health

Administration and Infection Control, Role of Emergency Medical Services (EMS) in Infection Control, Collaborative Efforts in Infection Control

DISCUSSION

Infection control is one of the critical aspects of the health care facilities across the globe. It seeks to lower the incidence of nosocomial infections and therefore shield patients, healthcare practitioners, as well as the entire community (Puro et al., 2022). This responsibility falls on different health care workers such as physicians, nurses, laboratory technicians, health administrators, and emergency medical service (EMS) that all have critical duties in carrying out and enforcing infection prevention and control measures. The respective functions and contributions of each role enhance the strength of healthcare systems and shield them from outbreaks and other new communicable diseases. In the following article, we reviewed the five major professional groups involved in infection control and co-dependency of these groups towards the realization of a safer health care environment.

Role of Physicians in Infection Control

Physicians play an active role in infection control as they are instrumental in developing protocols and knowledge as to correct identification and control of infections. Doctors examine patients, quickly diagnose their conditions and start the right procedures that help prevent infections. They are also crucial in advising on the right use of antibiotics and other antimicrobial agents and this is very important when it comes to the prevention of antibiotic resistance. Furthermore, physicians engage in the antibiotics stewardship to ensure that the existing antibiotics are not overused or misused hence retaining their efficacy (Barlam et al., 2016).

Not only do physicians get involved in day-to-day functions of combating infections but they are also involved in formulation of infection control policies within their institutions. They also participate in research activities that enhance the knowledge about management of infectious diseases including infection control and pathogen transmission (Fu & Wang, 2016). In addition, physicians also engage in education and training and share infection control practice with other members of the healthcare delivery team.

Nursing and Infection Control

Nurses are providers of basic treatment and are an essential force in the prevention and fight against infections because they spend considerable and close amount of time with the patients. Nurses enforce infection control measures such as hand washing, wearing of PPE, and use isolation as and when required (Peter et al., 2018). By doing so, the nurses contribute to reduction of spread of pathogens within and outside the health facilities.

Patient care is performed by nurses, who are supposed to monitor the patients' status for infection indicators and quickly inform physicians and infection control specialists. This makes a proactive role possible and can reduce hospital acquired illnesses (HAIs). To clients and families too, nurses offer instruction about precautions and procedures to prevent transmission of infection and to promote compliances. Moreover, nursing leadership plays an important role of creating and maintaining safe culture regarding infections in healthcare organizations as well as ensuring that protocols are observed as well as engendering the quality improvement of services (Dekker et al., 2019).

Contribution of Laboratory Services to Infection Control

Diagnosis is a key aspect of infection control and this makes laboratory services constitute an essential component. Molecular diagnostics are used in laboratories in order to identify pathogens speedily and effectively. Early and accurate identification helps the healthcare workers to start appropriate treatment and isolation to prevent infection transmission (Centers for Disease Control and Prevention, 2019).

Laboratories also have an important function of surveillance for development of antimicrobial resistance and assists in the approach to control it as well as help in deciding the best treatment. Amidst the team of infection control teams therefore laboratory operations provide valuable information on deciding on patients' fate in an effort to minimize possible infection risks within particular healthcare settings (Gandre et al., 2016). Other biosafety also come in handy as laboratory staff exercises precautions in order to avoid contracting the virus or influencing its spread in the course of handling specimens and conducting tests for the virus, or any other pathogen.

Health Administration and Infection Control

Infection control policies are created and administered by health administrators in the various healthcare facilities. They also involve the provision of resources, monitoring staffs compliance with regulatory measures, and training staffs on Infection Control Measures. It is the responsibility of administrators in charging institutions to ensure they embed infection prevention measures into a culture of safety in the organization (Clayton & Miller, 2017).

They also have an important function in planning for preparedness and response, specially during any outbreak of infectious diseases. This ensures that they are involved in sourcing of relevant items such as personal protective equipment and laying down of contingency plans that allow active healthcare facility functioning during emergencies. Through endorsing infection control measures, health administrators involve themselves in

a process that influences the medical care extensive and its capacity of mitigating public health threats (Binyane, 2018).

Role of Emergency Medical Services (EMS) in Infection Control

EMS providers are usually the first to respond to patients requiring acute medical care or who have infectious agents. These include what kind of personal protective equipment to wear, how to wash their hands or not, and how to clean the equipment afterwards (Kahn, 2020). Since, EMS personnel work under diverse and in some cases dynamic environment, they are able to practice infection control in light of the needs that their patients have.

The proper management and prevention of infection control measures are of significant importance, particularly in the context of EMS due to high contact rates with the community and the transportation of patients across different healthcare facilities. These interactions make creation of possible vectors for pathogen transfer. EMS providers also practice high levels of standard precautions during their patients' care and handling of medical equipment, which prevent epidemic transmission of diseases to other facilities and community chunks (Curr & Baker 2024). Also, they are privileged to undergo training continuously and being offered vaccines since both providers and patients are at high risk of acquiring infections from infectious agents.

Collaborative Efforts in Infection Control

Different professional groups each have their part to play in contributing towards infection prevention and control; their work tends to overlap. In general, the transmission of infection can be controlled only when there is good communication between the healthcare providers/administrators/EMS personnel (Spencer et al., 2016). Infections and treatment are diagnosed based on accurate data from laboratories by physicians. Neither specimen collection nor safe practice can be achieved independently through the effort of nurses and laboratory technicians; policies set by administrators play crucial roles in these interactions (Su, 2016).

Organisation of infection control committees with frequent involvement of the representatives from all professional groups facilitates the exchange of ideas and best practices, problem solving and fine tuning of approaches. The multi-professional team facilitates the development of a robust infection prevention and control approach that enhances patient care and safety and health system performance in general (Durrance-Bagale et al., 2022).

CONCLUSION

Physicians, nurses, laboratory services, health administrators and EMS providers all play critical roles in the efforts towards infection control in healthcare. In this context, by their specialisation and responsibilities, all groups play their part in the complicated approach that tends to avoid the infection risks in patients as well as health care stakeholders. These roles overlap to develop a strong infection control mechanism to meet the complexity of infectious diseases not only in normal practice but especially during emergencies. This study shows the value of health care approach to infection prevention and control as the responsibility is not confined to only several professions.

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