Impact of Hospital Administrators on Infection Control Strategies for Emerging Infectious Diseases: A Clinical Perspective

Abdulaziz Mobarak, Nabil Salah Alahmadi, Salman Helal Alsehli, Ali Aeid Alsehli, Abdullah Ali Alsehli, Sahar Najdi*, Mohammed Fazi Mohammed Almutairi, Roqayah Ibrahim Bellou, Zaki Maqbool Al-Oufi, Abdullah Awwadhah Almutiri, Abdulmajeed Muidh Almutairi, Taher Muidh Owaidh Almutairi, Badr Ahmed Shaqroon, Ahmed Eiadh Alruethy, Waleed Fagir Bakhsh

Madinah Health Cluster, Ministry of Health, Saeed bin Al-Aas, Saudi Arabia
Email: Sanajdi@moh.gov.sa

Abstracts

Thereby, EIDs pose huge threats to health care infrastructures everywhere due to unprepared infrastructures and poor immunity levels of population. It discusses how key role players, the hospital administrator, would play a big role in managing EID infections as well as strategies related to infection control. Such vital factors include resource allocation, implementation of policies, training, and building a culture for safety as well as working under an interdisciplinary approach. COVID-19 pandemics are best used as case studies both where successes occurred and where infection prevention lacked. Findings point toward robust surveillance, real-time data analytics, and the emotional support required for the healthcare workers involved in combating EIDs. The work discusses the socio-economic implications of EIDs and the utmost need to adapt strategies at resource-poor settings. Adding their recommendations with proper training, technological adaptations, and well-defined policymaking, they can decrease the impact of EID. By including technology, teamwork, and psychological impacts, the hospital administrators can develop such healthcare systems that can take on future challenges. It is a transformational effort that proactive leadership and innovation can make to combat the global health threat.

Keywords: Emerging infectious diseases, infection control, hospital administrators, healthcare policy, surveillance systems, COVID-19, safety culture, resource allocation, healthcare training, interdisciplinary collaboration.

1. Introduction

Emerging infectious diseases (EIDs) are communicable diseases whose incidence has recently increased, whose geographic range has recently expanded, or to which humans have recently

become exposed. The category can also be further divided into new recognized pathogens and the diseases that have re-emerged by showing a rise in their incidence or spread due to a myriad of factors such as the change in human behavior, environmental changes, and the evolutionary pressures from the microbes themselves (Lam et al., 2020; Mangu et al., 2016). It calls across different borders that EIDs create very significant threats to global health, especially because of a minimal immunity in the population against these novel pathogens in the human population, making it prone to widespread outbreak and pandemics (Lam et al., 2016; Laperche, 2011). The COVID-19 pandemic has starkly illustrated challenges, which EIDs pose at their best in healthcare settings. The spread of SARS-CoV-2 exposed lapses in health systems everywhere, where there is inappropriate infection control education among the healthcare practitioners and not properly prepared healthcare facilities for any emerging pathogen (Tago, 2023).

Studies have shown that the healthcare workers typically do not have the appropriate training and equipment to properly address EIDs, which exacerbates the spread of infections in healthcare settings (Kamali, 2024; Joshi Sonopant G, 2020). For example, the impact of the COVID-19 pandemic demonstrated that most of the healthcare centers were under-prepared for the stream of patients afflicted with the infectious diseases that resulted in the high cases of nosocomial infections and flooded healthcare resources (Fu, 2016; Kudo et al., 2018). EIDs also have deep socio-economic impacts. This mainly occurs in resource-constrained settings where the health infrastructure is already congested. The economic burden of outbreaks can be huge, not only to health systems but also to the general working of society (Kharbach & Khallouk, 2020). It was as if the Ebola, Zika, and now the monkeypox viruses have shone a light on some of the needs for suitable public health strategies, among them surveillance, rapid response capacity, and effective communication by health service providers (Redding et al., 2017; Polk et al., 2023). It is essential measures that reduce risk associated with EIDs, therefore building resilience in health systems while responding to outbreaks like the one in question (Silva-Jr et al., 2022; Shi, 2024).

Infection control and management in crises are essential for educating the healthcare providers. A study indicates that health care professionals, particularly hospitalists, have a keen interest in education on infectious disease crisis management, including safety precautions, emergency response, and coordination with local authorities Tago (2023). In this way, training equips the necessary skills to manage outbreaks and fosters a culture of safety and preparedness in health care settings. In addition, the clinical scenarios of health care professionals with patients infected with COVID-19 suggested that a complete handling strategy that encompasses care management and the welfare of professionals was needed (Liu et al., 2020). The limited number of facts regarding the causes and treatment of COVID-19 further complicated the medical response, and thus emerged the need for appropriate communication by healthcare professionals (Choi, 2024).

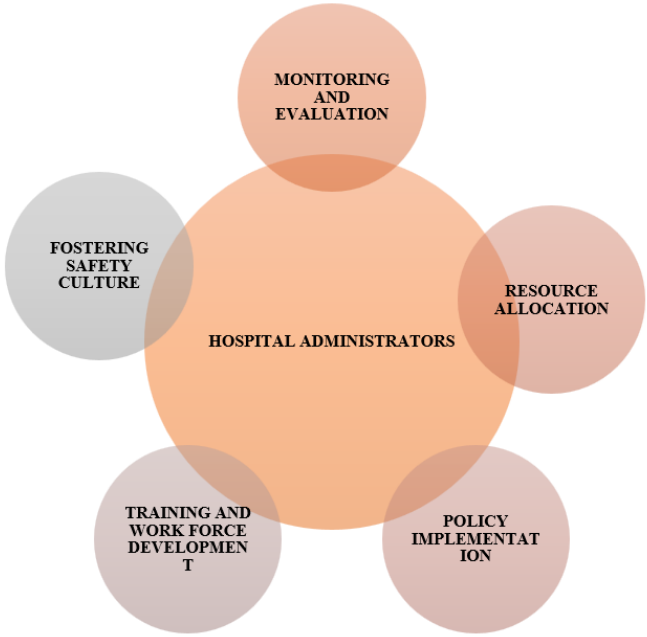

Figure 1. Comprehensive Infection Control Framework for Hospital Administrators.

Mental health is yet another important aspect in the clinical view of EIDs. The worker risks becoming burnt out, anxious, and depressed because of the high-stress environment portrayed by the management of infectious diseases (Hu et al., 2020). It then leads to a conflict of professional responsibility and personal safety, creating a psychological burden of patient care from highly infectious diseases, which in turn will impair the quality of care (Lee et al., 2020). Such mental health issues need mitigation for the establishment of an effective healthcare workforce that is resilient in tackling EIDs. For example, promoting policies that can improve sleep health and well-being in healthcare professionals leads to increased performance and motivation to take care of patients during an outbreak (Li et al., 2020). Besides that, nursing professionals significantly contribute to the management of EIDs. Because they are usually the frontline in most healthcare settings, they perform such a variety of roles. Among these are direct patient care, service management, and decision-making (Silva et al., 2022). According to various studies, prepping nurses for the management of emerging infectious diseases can be significantly enhanced with training in targeted aspects ("Nurses' Preparedness regarding Emerging Infectious Diseases (EID) in Selected Hospitals of Maharashtra (India)", 2020).

2. Overview of Infection Control Strategies

Infection control strategies have been amongst the very important things aimed to reduce the transmission of infections especially in these emerging infectious diseases and the others

challenging the pathogens with SARS-CoV-2, among others. Proper infection control measures in a hospital therefore includes a set of practices aimed at lessening health care-associated risk factors and safety for both patients and personnel. Hygiene protocols on hand hygiene about infection control are viewed as one of the simplest techniques implemented, yet hand hygiene is applied as among the most effective ways for the prevention of infections in hospitals. According to various findings, strict adherence to practices concerning hand hygiene lowers incidence dramatically Alshammari et al., 2022; Geberemariyam et al., 2018). Hospitals implement multimodal interventions incorporating education, reminders, and monitoring to improve the observance of health workers with hand hygiene (Aghdassi et al., 2019; Alshathri, 2021).

Table 1: Core infection control strategies and measures.

Strategy	Description	References
Hand Hygiene	Strict adherence to hand hygiene protocols reduces infection rates significantly.	Alshammari et al. (2022)
Personal Protective Equipment (PPE)	Proper use of masks, gloves, and gowns minimizes exposure risks.	Cattelan et al. (2020)
Environmental Cleaning	Regular disinfection of surfaces in healthcare facilities.	Baswa et al. (2021)
Isolation Practices	Use of isolation rooms and cohorting strategies to prevent cross-infection.	Evans et al. (2020)

PPE also has a huge role in the prevention of infection in a hospital setting. The proper wearing of PPE, including masks, gloves, gowns, and face shields, prohibits the exposure of health professionals to infectious agents. During the COVID-19 pandemic, hospitals implemented strict protocols on the use of PPE, training health professionals on proper putting on and removal to minimize contamination (Grosso et al., 2020; Cattelan et al., 2020). This can be due to the increased effectiveness offered by the combination of such PPE use with additional modes of infection control: environmental cleaning and disinfection (Baswa et al., 2021; Jang et al., 2022). The following is another very basic principle that concerns monitoring infections and antibiotics resistance. Monitoring infection levels and resistance trends can help to identify an outbreak at its early stage and thus enable interventions in a healthcare organization. For instance, typically, hospitals would conduct regular audits and reviews of their infection prevention programs in order to monitor the success of the infection prevention program and make appropriate changes thereto (Chen et al., 2021; Alshammari et al., 2022; Tenna et al., 2013).

One of the most important measures used in the care of patients with a known or suspected infection is the use of isolation. Most hospitals have infection and isolation rooms to prevent cross-contamination among patients and between healthcare providers. Trenchant policies relating to the adoption of isolation measures combined with minimal visitor access and cohorting has served to drastically curtail infections in the clinical environment (Ding et al., 2021; Li, 2023; Evans et al., 2020). Proper education and training of healthcare workers are fundamental to effective infection control measures. Infection prevention practices, proper use of PPE, and the importance of hand hygiene should be refreshed in training sessions to keep the staff's awareness and compliance at a high level (Alshathri, 2021; Geberemariyam et al., 2018). Besides, the culture of safety and accountability in the healthcare settings will make the staff

maintain infection control practices and report any violation of practice (Chowell et al., 2015; Dimcheff et al., 2020).

2.1 Lack of Adequate Infrastructure and Infrastructure Equipment:

Most of the hospitals, especially developing ones, lack adequate infrastructural inputs in terms of insufficient number isolation rooms, sanitation facilities, as well as unavailability of basic tools and equipment like PPE, disinfectants. For example, one study reports that poor infrastructure and shortage of equipment are the common significant barriers to effective infection control (Ider et al., 2012; This further leads to failure of the infection prevention measures with more HAIs.

2.2 Staffing Inadequacies and Over workload:

Health facilities face various challenges in ensuring adequate staffing. High patient-to-nurse ratios lead to workload increases among the available workforces. High patient-to-nurse ratios lead to burnout and poor adherence to infection prevention and control practices, such as hand hygiene and proper utilization of PPE (Kimbowa et al., 2022; Hashjin et al., 2014). Whenever there are surges in the hospital activities, the healthcare personnel get overwhelmed and tend to prioritize patients' needs over all these other activities.

2.3 Knowledge Deficiency Gaps and Training Deficiencies

The difference between theoretical knowledge of infection control practices and its actual practice among the health care professionals is quite wide most of the time. It has been confirmed that several health care providers do not have proper education in terms of infection prevention, and the measures are practiced variably among the providers (Vijitha, 2024). Training and continuous education should be provided so that staff members are up-to-date on the guidelines and best practices.

2.4 Cultural and Behavioral Barriers:

The culture of healthcare organizations could be what determines compliance with infection control practices. The culture is one of resistance to change, with no accountability and does not support leadership in general. Such an environment does not favor the importance of infection control (Gichuhi, 2015). It takes into account non-compliance based on behavioral factors, which include complacency or a lack of understanding about why certain practices are so vital.

2.5 Antibiotic Resistance:

It creates an enormous challenge for infection control practices since infections from the multidrug-resistant pathogens are brought about by antibiotic-resistant pathogens that make treatment cumbersome and also provide adequate time for HAIs to be manifested (Kubde, 2023; El-Baky et al., 2020).

2.6 Lack of Consistent Surveillance and Reporting:

It forms a basis for effective surveillance in infection control that offers surveillance mechanisms to track changes and occurrences of infections, identification of any possible outbreaks, and evaluation on implementation progress; but for many hospitals, weak and incompetent

surveillance systems often attribute the infections to underreporting to enable timely interventions (Hernández-Gómez et al., 2015). Inconsistency would sometimes lead to the following unachieving chances of measuring the outcome concerning infection-control measures that could be set up.

2.7 Economic Limitations:

Economic factors impose constraints on a hospital to carry out the necessary infection control in terms of the capital input, supply provision, and staff training. Normally, budgetary constraints direct the hospital to focus on short-term operational requirements rather than taking long-term infection prevention approaches (Ider et al., 2012; Kubde, 2023). Such economic pressure has resulted in poor infection control practices with a high risk of HAIs.

3. The Role of Hospital Administrators in Infection Control

3.1 Resource Allocation:

Administrators are held responsible for the financial and human resources necessary to effectively control infections. This means funding for personal protective equipment, cleaning agents, and infection control staff. It has been identified that one of the main barriers for implementing infection control is lack of resources, particularly in the underfunded hospitals Brisibe et al. (2015). This will enhance the ability of health facilities to avert and manage infections by ensuring that budget allocations are done for infection control.

3.2 Policy Development and Implementation:

Usually, the hospital administrators make and enforce the infection control policy. Their leadership also plays a critical role in ensuring that the policies they make are in line with the national guidelines and best practices. For instance, the administrators may respond to the state mandates regarding infection control, which would determine the course of the infection control departments (Pogorzelska et al., 2012). The effectiveness of these policies could have a significant effect on the rate of infections in the hospital.

3.3 Training and Education:

Administrators have a crucial role to play in offering ongoing education and training to health workers on infection control practices. With this, administrators will be able to create a learning culture where staff members are always up to date with new techniques and guidelines on infection prevention. Studies have shown that training increases compliance with infection control practice among healthcare workers (Krishnan et al., 2020; Gichuhi, 2015).

3.4 Fostering a Culture of Safety:

Organizational culture in a hospital determines the effectiveness of implemented infection control measures. Without fear of reprisal, open communication by administrators will encourage staff and near miss reporting can easily create an environment of safety by requiring staff to hold themselves to the implementation of infection control protocols. An encouraging environment created may lead to greater compliance of the infection control practices of its staff

(Apisarnthanarak et al., 2012). There is some evidence that if the infection control practitioners promote accountability and safety, then the rate of infections decreases (Li, 2023).

3.5 Monitoring and Evaluation:

Hospital administrators are further responsible for ensuring that infection levels are tracked and systems implemented to measure the consequences of introducing infection control policies. Analysis of data on HAIs feeds into policy change decisions using such information. For instance, administrators can use administrative data to analyze prevailing trends in infection rates; then, allocate resources based on that information available (Patrick et al., 2013). Real-time monitoring leads to intervening before infections have a large spread.

3.6 Interdisciplinary and Collaborative Approaches:

Besides all this, administrators may provide leadership towards the collaboration of different departments in a hospital setting: nurses, pharmacists, and even those working in environmental services. Collaboration will ensure the exchange of information and resources, thereby forming an effective approach to the fight of infections (Apisarnthanarak et al., 2012). It has been learnt that infection control is most satisfactorily achieved by applying multidisciplinary teams of staff (Min et al., 2021).

4. Challenges Faced by Hospital Administrators

4.1 Lack of Adequate Resources:

The lack of adequate resources is the most common cause of the inability to control infections. Lack of funds, personnel, and equipment are some of the reasons that make infection control unachievable. Most of the hospitals in low-and middle-income countries have a very small budget, which makes them incapable of buying essential supplies like PPEs and disinfectants, (Mahomed et al., 2017) Jayatilleke, 2020). A systematic review revealed that a scarcity of resources and an unfavorable infection control practitioners to patient beds ratio are the barriers for the proper surveillance of healthcare-associated infections (HAIs) (Mahomed et al., 2017). Such scarcity results in suboptimal infection control practices and high rates of infection.

Table 2: Challenges in Infection Control.

Challenge	Description	References
Lack of Adequate Resources	Insufficient funding and equipment hinder infection control efforts.	Mahomed et al. (2017)
Staffing Shortages	High patient-to-nurse ratios lead to burnout and poor adherence to protocols.	Kimbowa et al. (2022)
Training Deficiencies	Gaps in education regarding infection control practices.	Vijitha (2024)
Antibiotic Resistance	Multidrug-resistant pathogens complicate treatment and infection prevention.	Kubde (2023)

4.2 High Workload and Staffing Shortages:

High workloads and shortages of staff have become a common issue for most hospital administrators, which might delay infection control measures. Overworked healthcare workers tend to perform immediate tasks rather than observe infection prevention protocols, especially when the patient care responsibilities overwhelm them (Dekker et al., 2019). This scenario leads to lapses in critical practices such as hand hygiene and the appropriate usage of PPE. Hence, the risk for HAIs increases.

4.3 Training and Education:

The most significant hindrance is that the health care staff members lack training and education in infection control practices. Most healthcare providers may not be sufficiently aware of the new guidelines or the necessity of some infection prevention practices (Adekanle et al., 2015). Administrators must ensure that there is an ongoing education and training program in place to keep abreast of infection control policies. This has an element of a significant challenge regarding the implementation, time, and resources.

4.4 Cultural and Behavioral Resistance:

In a healthcare institution, its culture plays an important role in the successful operation of infection prevention measures. There is poor accountability, weak support from leaders, and an avoidance attitude toward change (Heinrichs et al., 2018). A study proved that perceptions of organizational culture vary much between administration staff and front-line staff resulting in some misunderstanding and, therefore conflicts regarding infection control priority (Lyles et al., 2014). Achieving a safety and compliance-oriented culture helps overcome these barriers.

4.5 Complexity of Infection Control Policies:

Infection control policies can also be tough for administrators to deal with at times. Complex policies can even confuse staff members, bringing about inconsistency in infection control practices (Jalal, 2024). To avoid such scenarios, clear, practical, and service-specific infection control policies will have to be put by the administrators in their healthcare facility.

4.6 Economic Limitations

Hospitals are financially limited and are unable to invest in infection control measures such as improving facilities or employing additional personnel. The lack of funds necessitates the institutions to channel their resources to the current operational needs rather than spending it on long-term efforts of infection prevention (Zamberg et al., 2020; Balkhy et al., 2016). Economic pressure results in less-than-ideal infection control practices and enhances the risks of HAIs.

4.7 Inconsistent Surveillance and Reporting:

Effective infection control relies on robust surveillance systems to monitor infection rates and identify outbreaks. However, many hospitals lack comprehensive surveillance mechanisms, which can lead to underreporting of infections and a failure to implement timely interventions (Ige et al., 2011). Inconsistent data collection and reporting practices can hinder the ability to assess the effectiveness of infection control strategies.

5. Case Studies and Real-World Examples

5.1 Successes in Managing Outbreaks

5.1.1 Effective Protocol Implementation:

Many hospitals came up with effective infection control guidelines which helped them become a backbone in the management of outbreaks. For example, through the COVID-19 period, those hospitals that managed to issue clear guidelines on how patients are triaged, kept in isolation, and have them put on personal protective gear had better chances of halting the spread of the virus (Gao & Tan, 2021) Jiang et al., 2020). With fever clinics and designated COVID-19 wards, infected patients were successfully separated to effectively manage transmission. Such a move was fundamental to control transmission (Jiang et al., 2020).

5.1.2. Supporting the Health Workers:

Administrators who prioritized the mental and physical well-being of the healthcare workers had a better response to handling outbreaks. For example, in Singapore, nursing leaders were much supportive of the staff during the COVID-19 crisis, which led to the reduction of burnout and kept the morale of nurses high (Gao & Tan, 2021). This support was critical in ensuring that healthcare workers were still active and productive during times of high stress.

5.1.3. Technology and Data:

The use of technology, which involved real-time genomic sequencing, facilitated the monitoring of infections in hospitals and facilitated tracking transmission chains. This is the approach that was profoundly useful in controlling COVID-19 because it helped to identify sources of infection to provide guidelines for containment measures (Marinelli et al., 2022). This is because data-based decisions help the hospital have speedy and effective responses on newly emerging threats.

5.1.4. Communication and Collaboration:

Coordination and teamwork between the hospital administrators, public health officials, and other stakeholders were the reasons for the most effective control of the outbreak. An example of such an experience is during the MERS outbreak in South Korea, where good communication and coordination among the health facilities were necessary for the containment of the virus (Kim et al., 2017). The hospitals that are involved in partnerships and that keep the lines of communication open manage the outbreaks more effectively.

5.2 Unpreparedness to Control Breakouts

5.2.1. Unpreparedness

Most of the hospitals were not well prepared for the outbreaks. The COVID-19 break out exposed a significant gap in readiness in most of the hospitals, with too little stockpiles of PPE and less training for employees on infection control measures (Popescu, 2020). On many occasions, the influx of patients overwhelmed the hospitals and compromised care and increased infections (Johnston et al., 2021).

5.2.2. Cultural and Behavioral Resistance:

Barriers, some of which include lack of staff support to changes and poor adherence to infection control procedures. For example, during the MERS outbreak, cultural behaviors such as "doctor shopping" and family care-giving patterns facilitated the spread of the virus in health facilities within a very short period (Kim et al., 2017). Health facilities that failed to alter fixed patterns of behavior and thought faced more significant difficulties in controlling outbreaks.

5.3.3. Resource Limitations:

Lack of funds and manpower resulted in failure for most hospitals to effectively have good infection control. A resource limitation meant there was insufficient training, poor surveillance capacity, and lack of equipment that would be required for proper infection control (Popescu, 2020). Those hospitals that were not able to secure sufficient funding for their infection control programs were at a higher risk of experiencing outbreaks.

5.3.4. Poor Communication and Coordination:

Poor communication and coordination among health teams can result in fragmented responses during outbreaks. Studies have shown that fragmented communication systems in hospitals struggled to develop a coherent infection control approach, which enhanced the spread of infections (Son et al., 2018).

6. Collaboration with Clinical Teams

6.1 Interprofessional Teamwork:

Infection control is only achieved by teamwork of healthcare providers, including nurses, physicians, infection preventionists, and hospital administrators. Interprofessional teamwork has been shown to improve the outcome of infection prevention, where effective communication and coordination of the different team members lead to better outcomes Gregory et al. (2022). The administrators enable this teamwork through encouraging cooperation and ensuring that every member knows his or her role in the control of infections.

6.2 Resource Allocation and Support:

Adequate resources for infection control are allocated by administrators, which include human and equipment inputs. Fiscal and human resources provide an environment through which healthcare professionals are facilitated in carrying out infection control effectively (Tshitangano, 2014). Training and education help infection control programs respond to changing needs such as better design of the facility and enough supplies.

6.3 Training and Education:

The education programs on infection prevention and control are devised and implemented in hospitals in collaboration with healthcare providers. Continuous education keeps the staff updated about best practices as well as changes that occur in guidelines. A study has shown that healthcare workers who were educated in infection control practices adhered to more and had

fewer rates of HAIs (Modjo, 2024). The administrators play a significant role in ensuring that these education programs are accessible and available to all the staff.

6.4 Policy Formulation and Implementation:

The administrators collaborate with the healthcare providers to formulate and implement infection control policies that are in accordance with national and international guidelines. In this way, the policies become practical and tailored to the needs of the hospital (Buijtene & Foster, 2018). For instance, during the time of COVID-19 pandemics, adequate policy making in the case of rules of visitations and the isolation of a patient is highly required to control the spread of a virus; the same is devised in collaboration by administrators along with the clinical staffs (Buijtene & Foster, 2018).

6.5 Monitoring and Evaluation:

Hospital administrators collaborate with infection control teams to monitor infection rates and measure the effectiveness of interventions instituted. This entails monitoring HAIs data and using this data to drive policy changes and resource allocation (Avina & Sinha, 2022). In this regard, administrators can collaborate with healthcare providers to monitor trends and implement targeted interventions to enhance infection control practices.

6.6 Culture of Safety:

Administrators have an essential role in a hospital that should develop safety culture. They do this by allowing free discussion on infection control practice with staff and by providing them with a platform wherein they feel they can raise their issues without fear of getting back at them (Chow et al., 2018). A positive safety culture promotes teamwork among health care professionals and will lead to the following of the infection control practices.

6.7 Removing Barriers to Compliance:

The administrators of hospitals collaborate with health practitioners to discuss the obstacles that may obstruct the employees from adhering to the infection control activities. This encompasses the environmental assessment of the hospital setting, perception among staff members about the practices, and how their problems due to understaffing or any other issues with the resource availability (Barker et al., 2017). This way, the active participation of the staff can allow administrators to propose solutions that improve compliance and safety for patients.

7. Technological and Policy Interventions

7.1 Improved Surveillance Capabilities:

Electronic health records can always track the patient data and thus provide real-time surveillance on infection rates. Automated surveillance can track HAIs and alert the healthcare providers to possible outbreaks. For instance, it was determined in one investigation that electronic surveillance for CAUTIs enhanced the precision in infection detection compared to traditional manual procedures, allowing quicker responses to emerging trends of infections

(Wald et al., 2014). This capacity enables administrators to recognize and correct infection control problems before they grow.

7.2 Data Visualization and User-Centric Design:

Technology enables visualization of infection data, thus enabling health professionals to understand and act on that information. A study highlighted the use of eye-tracking techniques to assess visualizations of infection transmission data, which helped nurses understand patterns of infections and motivated them to engage in infection prevention practices (Yoon et al., 2016). Such accessible presentation of data helps the administrator to develop an awareness culture and compliance among the staff.

7.3 AI-Driven Infection Surveillance:

The AI algorithms can input enormous amounts of information from the EHRs and derive patterns that allow them to predict the impending outbreaks of infection. Indeed, a systematic review ascertained that AI-assisted surveillance methods did result in a high sensitivity combined with specificity to detect HAIs, making them potential valuable tools in infection control (Santos et al., 2021). By adopting the use of AI in hospital administrations, they enhance their capability to monitor infections and hence utilize the resources accordingly.

7.4 Standardization of Definitions and Reporting:

Electronic surveillance systems help standardize the definition of infections across clinical sites. This reduces reporting and interpretation variation, hence being very critical in benchmarking and comparing the infection rates (Wald et al., 2014). It allows administrators to implement targeted interventions based on consistent definitions for improving infection control outcomes.

7.5 Improved Communication and Collaboration:

EHRs allow the facilitation of better communication among care providers by having a common repository of patient information. Improved coordination is critical to the facilitation of infection control in case an outbreak occurs. This will ensure that all staff members are on the same page, hence enhancing coordination and adherence to infection prevention measures (Kose et al., 2022; Piliouras et al., 2015).

7.6 Support for Clinical Decision-Making:

EHRs may contain clinical decision support tools that provide alerts and reminders on infection control practices like hand hygiene compliance and appropriate antibiotic use. This helps the healthcare professional to make decisions in time, thus avoiding the risk of HAIs (Kaushal et al., 2015). The administrators can apply these systems to ensure infection prevention practices are integrated into routine clinical workflows.

7.7 Data-Driven Quality Improvement:

With the aid of EHRs, infections can be monitored in relation to the control practices followed and further analyzed. Administrators use such data to pinpoint potential improvement spots. For instance, infection control rates and compliance trends help in initiating quality improvement

projects directly on those areas where things go wrong (Quan et al., 2018). In this way, these programs are made more productive.

8. Impact on Patient Safety and Outcomes

8.1 Direct Impacts on Patient Safety

8.1.1 Implementation of the safety protocols:

For example, hospital administrators develop and implement safety policies directly involved in patient care. This is the case in EHRs, as there has been evidence to support enhanced patient safety through the decrease of medication errors and improved communication between healthcare providers Özer & Şantaş, 2019Tanner et al., 2015). This will develop the direct impact of administrators toward the safety of patient care.

8.2.2. Resource Allocation:

The administrators are basically responsible for the resource allocation, especially in the aspects of staffing, training, and equipment. Proper levels of staffing and well-trained personnel ensure high standards of patient safety. According to research, infections in hospitals with proper control measures and adequate support can be reduced, as Murphy et al., 2018, quote. Therefore, this result regarding safety of patients reflects the selection of administrators in terms of providing resources.

8.1.3. Monitoring and Reporting Systems:

The administrators would be able to provide for the establishment of monitoring and reporting systems that track patient safety incidents. As for instance, electronic trigger tools that would show delays in the time needed to diagnose would ensure that safety issues are addressed before them getting out of hand by health care teams (Hoon et al., 2017; Zimolzak et al., 2022). In so doing, administrators would ensure incidents involving safety are dealt with promptly and will thus increase the level of patient safety.

8.2 Indirect Effects on Patient Safety

8.2.1. Organizational Culture:

The culture that hospital administrators put in place is a direct relation to the general attitude existing regarding the matter of patient safety in an organization. A safety culture sets a positive trend that enhances open communication, teamwork, and adherence to safety procedures by healthcare professionals (Vaismoradi et al., 2020). The indirect impact of administrators promoting patient safety and developing an environment to support safety practices is indirectly enhancing the commitment of the staff to adhere to the safety standards.

8.2.2. Interprofessional collaboration:

Coordination among different health professionals providing the service is only possible through effective coordination that can guarantee patient safety. According to Patima et al. (2020) and Cunningham et al. (2011), administrators can enhance interprofessional collaboration, thus

improving communication and teamwork among disciplines. This will enable a team environment that incorporates all stakeholders in the activities of enhancing patient safety, thus enhancing their outcomes.

8.2.3. Training and education:

Administrators are held in charge of continued education and training of all personnel involved in healthcare settings with respect to best practices of safety. Continuing education usually translates into a much better implementation rate and better cultural hospital safety climate overall (Vaismoradi et al., 2020; Nijor et al., 2022). Training investment by an administrator would indirectly reach touch the care quality offered.

8.2.4. Technological Incorporation:

The integration of technology, for instance, EHRs and clinical decision support systems, can improve patient safety because information can be accessed promptly and correctly by medical professionals. However, the extent to which such technologies can effectively impact patient safety is dependent on whether the administrators can successfully implement them and ensure that staff is trained regarding their use (Tanner et al., 2015; Pacheco et al., 2019). Thus, in embracing and championing technology, administrators can have a direct indirect impact on patient safety.

8.2.5 Overcoming Barriers to Safety:

The hospital managers should identify and overcome the hindrances which may hinder patient safety, such as workload, time, or lack of communication systems, among others. After the identification of the hindrances, managers can strategize how to handle them and, therefore, create a conducive environment supporting safety initiatives for patients (Vaismoradi et al., 2020; Nijor et al., 2022). This secondary contribution results in improved patients' outcomes.

9. Future Directions and Recommendations

9.1 Develop comprehensive preparedness plans:

Emergency preparedness plans should be designed well and up to date for managers, including all possible EIDs. The plans will contain policies related to quick responses, distribution of resources, and communication if an outbreak occurs. According to a research study, clear policy and training among staff are necessary in case of an infectious disease emergency so that there can be a coherent response Takemura et al. (2022). A good design will enable health care facilities to be well-prepared for emerging threats in response.

9.2 Training and Education:

Health care personnel should be constantly educated and trained on infection control practices and emerging infectious diseases. Managers should train healthcare workers on the latest infection prevention guidelines, crisis management, and PPE use (Tago, 2023). According to research, well-trained staff will be able to handle outbreaks, thus the risk of transmission within

healthcare setting is reduced (Bleasdale et al., 2019). Another way of preparing for a real-life scenario about preparedness of staff involves the constant drills and simulation processes.

Table 3: Recommendations for Future Preparedness.

Recommendation	Description	References
Comprehensive Preparedness Plans	Policies for quick response, resource allocation, and communication during outbreaks.	Takemura et al. (2022)
Enhanced Training Programs	Continuous education on infection prevention and PPE usage.	Tago (2023)
Advanced Surveillance Systems	Real-time tracking of infections using AI and EHRs.	Shih et al. (2021)
Interprofessional Collaboration	Teamwork across disciplines for effective infection prevention.	Jeong et al. (2023)

9.3 Improve Surveillance Systems:

More sophisticated surveillance systems involve EHRs and AI analytics; these may enable earlier outbreak detection. Administrators should invest in technology, which allows real-time tracking of infection rates and trends to ensure timely intervention by the administrators (Shih et al., 2021). Good surveillance systems can provide very helpful information for decision-making and resource allocation during outbreaks.

9.4 Promote Interprofessional Collaboration:

Collaboration among healthcare professionals is essential for effective infection control. Administrators should promote teamwork and communication across disciplines, ensuring that all staff members are involved in infection prevention efforts (Jeong et al., 2023). By encouraging a culture of collaboration, administrators can enhance the overall response to emerging infectious diseases and improve patient safety.

9.5 Strengthen Infection Control Committees:

The formation and expansion of infection control committees within hospitals ensure that infection control is adopted and carried out in the right way. These committees should have members from all departments, including nurses, pharmacists, and those from administrative departments, hence, making them cover aspects completely (Kudo et al., 2018). Repeated meetings and assessment procedures will help show the points at which corrections need to be done; thus, share the practices that have been implemented there.

9.6 Develop Rapid Response Teams:

Infectious disease outbreaks can be promptly responded to by the administrators through the establishment of specially trained rapid response teams. It should be equipped to undertake appropriate infection control measures, analyze the risks, and ensure coordination with public health authority (Wang et al., 2021). This ensures that a committed team would be present which could accelerate the hospital response in reacting to emerging dangers.

9.7 Implement Research and Development:

Encouraging research and development in infection prevention and control may lead to the discovery of new innovative methods of handling EIDs. The administrators should promote activities aimed at exploring new technologies, treatments, and infection control protocols (Desborough et al., 2021). Such collaboration with academic institutions and public health organizations may also lead to the sharing of knowledge, thus boosting preparedness activities.

9.8 Engage in Community Preparedness:

Collaboration with local health departments and the community will promote better comprehensive public health preparedness in hospitals. Such a collaboration includes community-wide drills, resource sharing, and developing a response plan for an infectious disease outbreak through collaboration (He et al., 2021). Through community engagement, hospitals can enhance their response capabilities and improve public health outcomes.

9.9 Emotional and Psychological Preparedness:

Outbreaks take a human toll on health workers. Administrators should therefore have strategies to support the mental well-being of the staff through and after outbreaks (Chen et al., 2023). In fostering an environment of psychological safety among healthcare personnel, it is important to prioritize counseling services to assist them in managing the stress associated with infectious illness management.

9.10 Review and Learn from Past Experience:

Administrators should have broad reviews of previous outbreaks so that lessons learned and areas of improvement can be made. Understanding the effectiveness of response strategies and measures of infection control will be indispensable in guiding future preparedness efforts (Kalantary et al., 2021). Lessons learned and experiences from past outbreaks may help hospitals to become much more resilient and adaptable.

10. Conclusion

Hospital administrators play the greatest part in strategic infection control management in an area of emerging infectious diseases. Hospital administrators have a full-range responsibility in resource allocation, policy development, and in workforce training and creation and maintenance of a safe accountable health system. The challenges created in the COVID-19 epidemic call for proactive activities; for example, enhancing modern surveillance technologies and for addressing mental health issues within health service providers. The results indicate that interdisciplinary collaboration and data-driven decision-making are crucial for effective infection prevention. Socio-economic disparities and equitable access to resources across the world are a need to be improved in the future, and globally, collaborations must improve. By investing in innovative solutions such as artificial intelligence and electronic health records, administrators can improve response capabilities and patient outcomes. The overall approach of leadership, training, technology, and collaboration is the main factor that will help in ensuring healthcare systems are better prepared to cope with the changes in the infectious disease landscape. The efforts of

hospitals in these directions will protect public health and help build resilience against any future outbreaks.

Acknowledgment

For supplying the literature required to assemble the study, the authors express their gratitude to the editors, publishers, open access databases, and Cochrane Database, particularly the Cochrane Library, CINAHL, PubMed, Medline, Embase, Google Scholar, and BMJ Clinical Evidence.

Author contributions

The submission of the work to the journal for publication is approved by all authors. With assistance from the corresponding author, the first author wrote the initial draft of the manuscript. Editing the manuscript and gathering material, including creating tables and figures, were tasks that all co-authors took part in.

Conflict of Interest

The authors declare no conflict of interest, financial or otherwise.

Ethical Approval

Not Applicable

WORKS CITED

Joshi Sonopant G. (2020). Nurses' preparedness regarding emerging infectious diseases (eid) in selected hospitals of maharashtra (india). Indian Journal of Forensic Medicine & Toxicology. https://doi.org/10.37506/ijfmt.v14i4.12263

Adekanle, O., Ndububa, D., Olowookere, S., Ijarotimi, O., & Ijadunola, K. (2015). Knowledge of hepatitis b virus infection, immunization with hepatitis b vaccine, risk perception, and challenges to control hepatitis among hospital workers in a nigerian tertiary hospital. Hepatitis Research and Treatment, 2015, 1-6. https://doi.org/10.1155/2015/439867

Aghdassi, S., Hansen, S., Bischoff, P., Behnke, M., & Gastmeier, P. (2019). A national survey on the implementation of key infection prevention and control structures in german hospitals: results from 736 hospitals conducting the who infection prevention and control assessment framework (ipcaf). Antimicrobial Resistance and Infection Control, 8(1). https://doi.org/10.1186/s13756-019-0532-4

Alshammari, F., Lim-Lagura, G., Mostoles, R., Gonzales, F., Alsayed, S., & Mina, E. (2022). Infection prevention and control practices among staff nurses in hail, ksa: basis for improved patient safety. Journal of Health and Medical Sciences, 5(4). https://doi.org/10.31014/aior.1994.05.04.249

Alshathri, n. (2021). Knowledge, attitude and practice regarding infection control measures among healthcare workers at king khaled eye specialist hospital (kkesh) in riyadh, ksa.. https://doi.org/10.21203/rs.3.rs-958840/v1

Ananth, L. and Hosamani, P. (2020). Management of ent surgical emergencies amidst covid-19 lockdown: our experience in a tertiary referral hospital. Indian Journal of Otolaryngology and Head & Neck Surgery, 73(2), 180-187. https://doi.org/10.1007/s12070-020-01987-7

Apisarnthanarak, A., Greene, M., Kennedy, E., Khawcharoenporn, T., Krein, S., & Saint, S. (2012). National survey of practices to prevent healthcare-associated infections in thailand: the role of safely culture and collaboratives. Infection Control and Hospital Epidemiology, 33(7), 711-717. https://doi.org/10.1086/666330

Apisarnthanarak, A., Weber, D., Ratz, D., Saint, S., Khawcharoenporn, T., & Greene, M. (2017). National survey of environmental cleaning and disinfection in hospitals in thailand. Infection Control and Hospital Epidemiology, 38(10), 1250-1253. https://doi.org/10.1017/ice.2017.171

Avina, K. and Sinha, R. (2022). Development of an automated hospital infection control surveillance toolkit. Journal of Health Management, 24(2), 187-202. https://doi.org/10.1177/09720634221088442

Bajwa, S. (2024). Comparison of outcome in early vs conventional feeding after colostomy closure in paediatric population. JHRR, 4(1), 1411-1416. https://doi.org/10.61919/jhrr.v4i1.641

Balkhy, H., Alenazi, T., Alshamrani, M., Baffoe-Bonnie, H., Arabi, Y., Hijazi, R., … & Saeed, A. (2016). Description of a hospital outbreak of middle east respiratory syndrome in a large tertiary care hospital in saudi arabia. Infection Control and Hospital Epidemiology, 37(10), 1147-1155. https://doi.org/10.1017/ice.2016.132

Barker, A., Brown, K., Siraj, D., Ahsan, M., Sengupta, S., & Safdar, N. (2017). Barriers and facilitators to infection control at a hospital in northern india: a qualitative study. Antimicrobial Resistance and Infection Control, 6(1). https://doi.org/10.1186/s13756-017-0189-9

Baswa, A., Stewardson, A., Ayton, D., Russo, P., & Doyle, J. (2021). Experience and perspectives of infection prevention staff of the covid-19 response in australian hospitals.. https://doi.org/10.21203/rs.3.rs-907814/v1

Bleasdale, S., Sikka, M., Moritz, D., Fritzen-Pedicini, C., Stiehl, E., Brosseau, L., … & Jones, R. (2019). Experience of chicagoland acute care hospitals in preparing for ebola virus disease, 2014–2015. Journal of Occupational and Environmental Hygiene, 16(8), 582-591. https://doi.org/10.1080/15459624.2019.1628966

Brisibe, S., Ordinioha, B., & Gbeneolol, P. (2015). The effect of hospital infection control policy on the prevalence of surgical site infection in a tertiary hospital in south-south nigeria. Nigerian Medical Journal, 56(3), 194. https://doi.org/10.4103/0300-1652.160393

Buijtene, A. and Foster, D. (2018). Does a hospital culture influence adherence to infection prevention and control and rates of healthcare associated infection? a literature review. Journal of Infection Prevention, 20(1), 5-17. https://doi.org/10.1177/1757177418805833

Cattelan, A., Sasset, L., Meco, E., Cocchio, S., Barbaro, F., Cavinato, S., … & Baldo, V. (2020). An integrated strategy for the prevention of sars-cov-2 infection in healthcare workers: a prospective observational study. International Journal of Environmental Research and Public Health, 17(16), 5785. https://doi.org/10.3390/ijerph17165785

Chen, F., Li, L., Li, J., Hong-xia, G., Cao, X., & Gong, S. (2023). Development of infectious disease emergency response competencies for nurses in china: a delphi study and an analytic hierarchy process. Journal of Nursing Management, 2023, 1-12. https://doi.org/10.1155/2023/9952280

Chen, Y., Xue, Y., Zhang, Y., Zhou, H., & Peng, L. (2021). Infection prevention strategy in general hospital under regular epidemic prevention and control. Open Journal of Preventive Medicine, 11(04), 159-167. https://doi.org/10.4236/ojpm.2021.114013

Choi, S. (2024). The coronavirus disease 2019 infodemic: a concept analysis. Frontiers in Public Health, 12. https://doi.org/10.3389/fpubh.2024.1362009

Chow, E., Smit, M., & Mermel, L. (2018). Visitor screening and staff sick leave policies in us hospitals. Infection Control and Hospital Epidemiology, 39(8), 1006-1008. https://doi.org/10.1017/ice.2018.131

Chowell, G., Abdirizak, F., Lee, S., Lee, J., Jung, E., Nishiura, H., … & Viboud, C. (2015). Transmission characteristics of mers and sars in the healthcare setting: a comparative study. BMC Medicine, 13(1). https://doi.org/10.1186/s12916-015-0450-0

Cunningham, F., Ranmuthugala, G., Plumb, J., Georgiou, A., Westbrook, J., & Braithwaite, J. (2011). Health professional networks as a vector for improving healthcare quality and safety: a systematic review. BMJ Quality & Safety, 21(3), 239-249. https://doi.org/10.1136/bmjqs-2011-000187

Dekker, M., Jongerden, I., Mansfeld, R., Ket, H., Werff, S., Vandenbroucke-Grauls, C., … & Bruijne, M. (2019). Infection control link nurses in acute care hospitals: a scoping review. Antimicrobial Resistance and Infection Control, 8(1). https://doi.org/10.1186/s13756-019-0476-8

Desborough, J., Dykgraaf, S., Phillips, C., Wright, M., Maddox, R., Davis, S., … & Kidd, M. (2021). Lessons for the global primary care response to covid-19: a rapid review of evidence from past epidemics. Family Practice. https://doi.org/10.1093/fampra/cmaa142

Dimcheff, D., Schildhouse, R., Hausman, M., Vincent, B., Markovitz, E., Chensue, S., … & Bradley, S. (2020). Seroprevalence of severe acute respiratory syndrome coronavirus-2 (sars-cov-2) infection among veterans affairs healthcare system employees suggests higher risk of infection when exposed to sars-cov-2 outside the work environment. Infection Control and Hospital Epidemiology, 42(4), 392-398. https://doi.org/10.1017/ice.2020.1220

Ding, J., Yan, Y., & Fu, M. (2021). The role of whole-process quality management mode in the self-protection and safety of first-line medical staff of covid-19. Yangtze Medicine, 05(01), 61-69. https://doi.org/10.4236/ym.2021.51007

El-Baky, R., Senosy, E., Omara, W., Mohamed, D., & Ibrahim, R. (2020). The impact of the implementation of culture-based antibiotic policy on the incidence of nosocomial infections in neonates hospitalized in neonatal intensive care unit in a general egyptian hospital in upper egypt, 2016-2018. Journal of Pure and Applied Microbiology, 14(3), 1879-1892. https://doi.org/10.22207/jpam.14.3.27

Evans, S., Agnew, E., Vynnycky, E., & Robotham, J. (2020). The impact of testing and infection prevention and control strategies on within-hospital transmission dynamics of covid-19 in english hospitals.. https://doi.org/10.1101/2020.05.12.20095562

Fifolt, M., Lee, R., Nafziger, S., & McCormick, L. (2021). Infectious disease hospital preparedness: lessons learned from the 2019 measles outbreak. Disaster Medicine and Public Health Preparedness, 16(3), 899-903. https://doi.org/10.1017/dmp.2021.18

Fu, C. (2016). Nosocomial infection control in healthcare settings: protection against emerging infectious diseases. Infectious Diseases of Poverty, 5(1). https://doi.org/10.1186/s40249-016-0118-9

Gao, Z. and Tan, F. (2021). Nurses' experiences in response to covid-19 in a psychiatric ward in singapore. International Nursing Review, 68(2), 196-201. https://doi.org/10.1111/inr.12680

Geberemariyam, B., Donka, G., & Wordofa, B. (2018). Assessment of knowledge and practices of healthcare workers towards infection prevention and associated factors in healthcare facilities of west arsi district, southeast ethiopia: a facility-based cross-sectional study. Archives of Public Health, 76(1). https://doi.org/10.1186/s13690-018-0314-0

Gichuhi, A. (2015). Health care workers adherence to infection prevention practices and control measures: a case of a level four district hospital in kenya. American Journal of Nursing Science, 4(2), 39. https://doi.org/10.11648/j.ajns.20150402.13

Giroti, A., Ferreira, A., Rigotti, M., Sousa, Á., Frota, O., & Andrade, D. (2018). Programas de controle de infecção hospitalar: avaliação de indicadores de estrutura e processo. Revista Da Escola De Enfermagem Da Usp, 52(0). https://doi.org/10.1590/s1980-220x2017039903364

Gregory, M., MacEwan, S., Sova, L., Gaughan, A., & McAlearney, A. (2022). A qualitative examination of interprofessional teamwork for infection prevention: development of a model and solutions. Medical Care Research and Review, 80(1), 30-42. https://doi.org/10.1177/10775587221103973

Grosso, A., Rigoli, R., Formentini, S., Perri, G., Scotton, P., Dapavo, G., … & Scarpa, G. (2020). Suppression of covid-19 outbreak among healthcare workers at the treviso regional hospital, italy and lessons for ophthalmologists. European Journal of Ophthalmology, 31(6), 2901-2909. https://doi.org/10.1177/1120672120982520

Hashjin, A., Kringos, D., Manoochehri, J., Ravaghi, H., & Klazinga, N. (2014). Implementation of patient safety and patient-centeredness strategies in iranian hospitals. Plos One, 9(9), e108831. https://doi.org/10.1371/journal.pone.0108831

He, J., Zhao, S., Zhang, H., Liu, X., Li, Q., & Fu, W. (2021). Emergency management of medical wastewater in hospitals specializing in infectious diseases: a case study of huoshenshan hospital, wuhan, china. International Journal of Environmental Research and Public Health, 19(1), 381. https://doi.org/10.3390/ijerph19010381

Heinrichs, A., Argudín, M., Mendonça, R., Deplano, A., Roisin, S., Dodémont, M., … & Denis, O. (2018). An outpatient clinic as a potential site of transmission for an outbreak of new delhi metallo-ß-lactamase-producingklebsiella pneumoniaesequence type 716: a study using whole-genome sequencing. Clinical Infectious Diseases, 68(6), 993-1000. https://doi.org/10.1093/cid/ciy581

Hernández-Gómez, C., Gabriel, M., Vallejo, M., Blanco, V., Correa, A., Cadena, E., … & Villegas, M. (2015). Introduction of software tools for epidemiological surveillance in infection control in colombia. Colombia Medica, 46(2), 60-65. https://doi.org/10.25100/cm.v46i2.1548

Hoon, S., Hek, K., Dijk, L., & Verheij, R. (2017). Adverse events recording in electronic health record systems in primary care. BMC Medical Informatics and Decision Making, 17(1). https://doi.org/10.1186/s12911-017-0565-7

Hu, D., Kong, Y., Li, W., Han, Q., Zhang, X., Zhu, L., … & Zhu, J. (2020). Frontline nurses' burnout, anxiety, depression, and fear statuses and their associated factors during the covid-19 outbreak in wuhan, china: a large-scale cross-sectional study. Eclinicalmedicine, 24, 100424. https://doi.org/10.1016/j.eclinm.2020.100424

Ider, B., Adams, J., Morton, A., Whitby, M., & Clements, A. (2012). Perceptions of healthcare professionals regarding the main challenges and barriers to effective hospital infection control in mongolia: a qualitative study. BMC Infectious Diseases, 12(1). https://doi.org/10.1186/1471-2334-12-170

Ige, O., Adesanmi, A., & Asuzu, M. (2011). Hospital-acquired infections in a nigerian tertiary health facility: an audit of surveillance reports. Nigerian Medical Journal, 52(4), 239. https://doi.org/10.4103/0300-1652.93796

Jain, M., Dogra, V., Mishra, B., Thakur, A., & Loomba, P. (2012). Infection control practices among doctors and nurses in a tertiary care hospital. Annals of Tropical Medicine and Public Health, 5(1), 29. https://doi.org/10.4103/1755-6783.92877

Jalal, M. (2024). Identifying expert opinions on the challenges and barriers faced by iraq's national plan for controlling hepatitis b.. https://doi.org/10.21203/rs.3.rs-4428979/v1

Jang, W., Kim, B., Kim, E., Song, K., Moon, S., Lee, M., … & Kim, H. (2022). Strategies for prevention of covid-19 transmission in hospitals: a nationwide survey of controversial issues related to infection control and prevention in korea.. https://doi.org/10.21203/rs.3.rs-1209219/v1

Jayatilleke, K. (2020). Challenges in implementing surveillance tools of high-income countries (hics) in low middle income countries (lmics). Current Treatment Options in Infectious Diseases, 12(3), 191-201. https://doi.org/10.1007/s40506-020-00229-2

Jeong, S., Song, M., & Jung, H. (2023). Development of a tool to measure compliance with infection prevention activities against emerging respiratory infectious diseases among nurses working in acute care and geriatric hospitals. Annals of Geriatric Medicine and Research, 27(1), 22-31. https://doi.org/10.4235/agmr.22.0095

Jiang, H., Liu, J., Ren, N., He, R., Li, M., & Dong, Q. (2020). Emergency management in fever clinic during the outbreak of covid-19: an experience from zhuhai. Epidemiology and Infection, 148. https://doi.org/10.1017/s0950268820001764

Johnston, F., Anderson, T., Harlock, M., Castree, N., Parry, L., Marfori, T., … & Stephens, N. (2021). Lessons learnt from the first large outbreak of covid-19 in health-care settings in tasmania, australia. Western Pacific Surveillance and Response, 12(4), 102-108. https://doi.org/10.5365/wpsar.2021.12.4.884

Joseph, N., Sistla, S., Dutta, T., Badhe, A., Rasitha, D., & Parija, S. (2010). Role of intensive care unit environment and health-care workers in transmission of ventilator-associated pneumonia. The Journal of Infection in Developing Countries, 4(05), 282-291. https://doi.org/10.3855/jidc.800

Kalantary, R., Jamshidi, A., Mofrad, M., Jafari, A., Heidari, N., Fallahizadeh, S., … & Torkashvand, J. (2021). Effect of covid-19 pandemic on medical waste management: a case study. Journal of Environmental Health Science and Engineering, 19(1), 831-836. https://doi.org/10.1007/s40201-021-00650-9

Kamali, M. (2024). Exploring the experiences of health care providers and managers in the covid-19 pandemic: a summative content analysis. Journal of Nursing and Midwifery Sciences, 11(2). https://doi.org/10.5812/jnms-146148

Kaushal, R., Edwards, A., & Kern, L. (2015). Association between electronic health records and health care utilization. Applied Clinical Informatics, 06(01), 42-55. https://doi.org/10.4338/aci-2014-10-ra-0089

Khabbaz, R., Moseley, R., Steiner, R., Levitt, A., & Bell, B. (2014). Challenges of infectious diseases in the usa. The Lancet, 384(9937), 53-63. https://doi.org/10.1016/s0140-6736(14)60890-4

Kharbach, Y. and Khallouk, A. (2020). Contamination risk in urology operating room during the covid-19 pandemic. Sao Paulo Medical Journal, 138(4), 345-346. https://doi.org/10.1590/1516-3180.2020.019512062020

Kim, K., Tandi, T., Choi, J., Moon, J., & Kim, M. (2017). Middle east respiratory syndrome coronavirus (mers-cov) outbreak in south korea, 2015: epidemiology, characteristics and public health implications. Journal of Hospital Infection, 95(2), 207-213. https://doi.org/10.1016/j.jhin.2016.10.008

Kimbowa, I., Ocan, M., Eriksen, J., Nakafeero, M., Obua, C., Lundborg, C., … & Kalyango, J. (2022). Characteristics of antimicrobial stewardship programmes in hospitals of uganda. Plos One, 17(5), e0268032. https://doi.org/10.1371/journal.pone.0268032

Klompas, M., Baker, M., Rhee, C., Tucker, R., Fiumara, K., Griesbach, D., … & Morris, C. (2021). A sars-cov-2 cluster in an acute care hospital. Annals of Internal Medicine, 174(6), 794-802. https://doi.org/10.7326/m20-7567

Kose, I., CECE, S., & BAYRAKTAR, E. (2022). Are electronic health records beneficial or not?. Journal of Health Systems and Policies, 4(1), 1-20. https://doi.org/10.52675/jhesp.1082576

Krein, S., Fowler, K., Ratz, D., Meddings, J., & Saint, S. (2015). Preventing device-associated infections in us hospitals: national surveys from 2005 to 2013. BMJ Quality & Safety, 24(6), 385-392. https://doi.org/10.1136/bmjqs-2014-003870

Krishnan, R., Kamarudeen, M., Ravindran, M., & Shinu, K. (2020). Are healthcare workers safe? facility assessment of airborne infection control measures in public hospitals of kerala. International Journal of Community Medicine and Public Health, 7(7), 2723. https://doi.org/10.18203/2394-6040.ijcmph20203005

Kubde, D. (2023). Importance of hospital infection control. Cureus. https://doi.org/10.7759/cureus.50931

Kudo, D., Sasaki, J., Ikeda, H., Shiino, Y., Shime, N., Mochizuki, T., … & Watanabe, M. (2018). A survey on infection control in emergency departments in japan. Acute Medicine & Surgery, 5(4), 374-379. https://doi.org/10.1002/ams2.360

Kwak, K., Kim, J., Kwon, K., & Yeo, J. (2022). Infection prevention measures and outcomes for surgical patients during a covid-19 outbreak in a tertiary hospital in daegu, south korea: a retrospective observational study. Journal of Yeungnam Medical Science, 39(3), 223-229. https://doi.org/10.12701/yujm.2021.01431

Lam, S., Kwong, E., Hung, M., & Chien, W. (2020). Emergency nurses' perceptions regarding the risks appraisal of the threat of the emerging infectious disease situation in emergency departments. International Journal of Qualitative Studies on Health and Well-Being, 15(1), 1718468. https://doi.org/10.1080/17482631.2020.1718468

Lam, S., Kwong, E., Hung, M., & Pang, S. (2016). Bridging the gap between guidelines and practice in the management of emerging infectious diseases: a qualitative study of emergency nurses. Journal of Clinical Nursing, 25(19-20), 2895-2905. https://doi.org/10.1111/jocn.13343

Laperche, S. (2011). Definition of emerging infectious diseases. Isbt Science Series, 6(1), 112-115. https://doi.org/10.1111/j.1751-2824.2011.01452.x

Lee, J., Hong, J., & Park, E. (2020). Beyond the fear: nurses' experiences caring for patients with middle east respiratory syndrome: a phenomenological study. Journal of Clinical Nursing, 29(17-18), 3349-3362. https://doi.org/10.1111/jocn.15366

Li, J., Kong, X., Li, F., Wu, B., Xu, H., Wu, T., … & Liu, J. (2020). Sleep quality and health in healthcare professionals fighting against covid-19: a comparative study between high risk area (hubei province) and low risk area (jiangsu province) in china.. https://doi.org/10.21203/rs.3.rs-27217/v1

Li, X. (2023). Comparison of emergency management strategies for nosocomial infections between two earthquakes. Journal of Clinical and Nursing Research, 7(5), 192-200. https://doi.org/10.26689/jcnr.v7i5.5398

Liu, Q., Luo, D., Haase, J., Guo, Q., Wang, X., Liu, S., … & Yang, B. (2020). The experiences of health-care providers during the covid-19 crisis in china: a qualitative study. The Lancet Global Health, 8(6), e790-e798. https://doi.org/10.1016/s2214-109x(20)30204-7

Lyles, R., Moore, N., Weiner, S., Sikka, M., Lin, M., Weinstein, R., … & Sinkowitz-Cochran, R. (2014). Understanding staff perceptions about klebsiella pneumoniae carbapenemase–producing enterobacteriaceae control efforts in chicago long-term acute care hospitals. Infection Control and Hospital Epidemiology, 35(4), 367-374. https://doi.org/10.1086/675596

Mahomed, S., Mahomed, O., Sturm, A., Knight, S., & Moodley, P. (2017). Challenges with surveillance of healthcare-associated infections in intensive care units in south africa. Critical Care Research and Practice, 2017, 1-7. https://doi.org/10.1155/2017/7296317

Mangu, C., Manyama, C., Msila, H., Sudi, L., Chaula, G., Ntinginya, N., … & Maboko, L. (2016). Emerging viral infectious disease threat: why tanzania is not in a safe zone. Tanzania Journal of Health Research, 18(3). https://doi.org/10.4314/thrb.v18i3.8

Marinelli, T., Dolan, L., Jenkins, F., Lee, A., Davis, R., Crawford, S., … & Hal, S. (2022). The role of real-time, on-site, whole-genome sequencing of severe acute respiratory coronavirus virus 2 (sars-cov-2) in guiding the management of hospital outbreaks of coronavirus disease 2019 (covid-19). Infection Control and Hospital Epidemiology, 44(7), 1116-1120. https://doi.org/10.1017/ice.2022.220

Min, Q., Yang, J., & Gong, X. (2021). The use of a three-in-one practice-management-innovation training model in the construction of an infection control team. Risk Management and Healthcare Policy, Volume 14, 3403-3409. https://doi.org/10.2147/rmhp.s319155

Modjo, R. (2024). Covid-19 infection prevention and control for hospital workers in indonesia. Frontiers in Public Health, 11. https://doi.org/10.3389/fpubh.2023.1276898

Murphy, D., Meyer, A., Sittig, D., Meeks, D., Thomas, E., & Singh, H. (2018). Application of electronic trigger tools to identify targets for improving diagnostic safety. BMJ Quality & Safety, 28(2), 151-159. https://doi.org/10.1136/bmjqs-2018-008086

Nijor, S., Rallis, G., Lad, N., & Gokcen, E. (2022). Patient safety issues from information overload in electronic medical records. Journal of Patient Safety, 18(6), e999-e1003. https://doi.org/10.1097/pts.0000000000001002

Pacheco, T., Hettinger, A., & Ratwani, R. (2019). Identifying potential patient safety issues from the federal electronic health record surveillance program. Jama, 322(23), 2339. https://doi.org/10.1001/jama.2019.17242

Patima, P., Amiruddin, R., Pasinring, S., Salmah, A., Saleh, A., Rivai, F., … & Mallongi, A. (2020). Determinant factors of interprofessional collaborationin labuang baji general hospital. Medico-Legal Update. https://doi.org/10.37506/mlu.v20i4.2158

Patrick, S., Davis, M., Sedman, A., Meddings, J., Hieber, S., Lee, G., … & Schumacher, R. (2013). Accuracy of hospital administrative data in reporting central line–associated bloodstream infections in newborns. Pediatrics, 131(Supplement_1), S75-S80. https://doi.org/10.1542/peds.2012-1427i

Piliouras, T., Suss, R., & Yu, P. (2015). Digital imaging & electronic health record systems: implementation and regulatory challenges faced by healthcare providers.. https://doi.org/10.1109/lisat.2015.7160179

Pogorzelska, M., Stone, P., & Larson, E. (2012). Certification in infection control matters: impact of infection control department characteristics and policies on rates of multidrug-resistant infections. American Journal of Infection Control, 40(2), 96-101. https://doi.org/10.1016/j.ajic.2011.10.002

Polk, C., Sampson, M., Fairman, R., DeWitt, M., Leonard, M., Neelakanta, A., … & Passaretti, C. (2023). Evaluation of a health system's implementation of a monkeypox care model under the re-aim framework. Therapeutic Advances in Infectious Disease, 10. https://doi.org/10.1177/20499361231158463

Popescu, S. (2020). Roadblocks to infection prevention efforts in health care: sars-cov-2/covid-19 response. Disaster Medicine and Public Health Preparedness, 14(4), 538-540. https://doi.org/10.1017/dmp.2020.55

Quan, T., Hope, R., Clarke, T., Moroney, R., Butcher, L., Knight, P., … & Walker, A. (2018). Using linked electronic health records to report healthcare-associated infections. Plos One, 13(11), e0206860. https://doi.org/10.1371/journal.pone.0206860

Redding, D., Tiedt, S., Iacono, G., Bett, B., & Jones, K. (2017). Spatial, seasonal and climatic predictive models of rift valley fever disease across africa. Philosophical Transactions of the Royal Society B Biological Sciences, 372(1725), 20160165. https://doi.org/10.1098/rstb.2016.0165

Rhee, C., Baker, M., Vaidya, V., Tucker, R., Resnick, A., Morris, C., … & Program, C. (2020). Incidence of nosocomial covid-19 in patients hospitalized at a large us academic medical center. Jama Network Open, 3(9), e2020498. https://doi.org/10.1001/jamanetworkopen.2020.20498

Ryan, S., Sen, A., Staggers, K., Luerssen, T., & Jea, A. (2014). A standardized protocol to reduce pediatric spine surgery infection: a quality improvement initiative. Journal of Neurosurgery Pediatrics, 14(3), 259-265. https://doi.org/10.3171/2014.5.peds1448

Santos, R., Silva, D., Menezes, A., Lukasewicz, S., Dalmora, C., Carvalho, O., … & Vaz, T. (2021). Automated healthcare-associated infection surveillance using an artificial intelligence algorithm. Infection Prevention in Practice, 3(3), 100167. https://doi.org/10.1016/j.infpip.2021.100167

Shi, W. (2024). Exploring hospital resilience protective or risk factors: lessons for future disaster response efforts. Frontiers in Public Health, 12. https://doi.org/10.3389/fpubh.2024.1378257

Shih, H., Huang, Y., Hsieh, C., & Sung, T. (2021). A rapid clinic-based service for an emergency department of a tertiary teaching hospital during a dengue outbreak. Medicine, 100(14), e25311. https://doi.org/10.1097/md.0000000000025311

Silva, O., Cabral, D., Marin, S., Bitencourt, J., Vargas, M., & Meschial, W. (2022). Biosafety measures to prevent covid-19 in healthcare professionals: an integrative review. Revista Brasileira De Enfermagem, 75(1). https://doi.org/10.1590/0034-7167-2020-1191

Silva-Jr, F., Panda, S., Andrade, C., & Furnham, N. (2022). Editorial: current approaches in infectious disease drug discovery. Frontiers in Chemistry, 10. https://doi.org/10.3389/fchem.2022.1102402

Smith, J., MacDougall, C., Johnstone, J., Copes, R., Schwartz, B., & Garber, G. (2016). Effectiveness of n95 respirators versus surgical masks in protecting health care workers from acute respiratory infection: a systematic review and meta-analysis. Canadian Medical Association Journal, 188(8), 567-574. https://doi.org/10.1503/cmaj.150835

Son, H., Lee, W., Kim, H., Lee, K., & You, M. (2018). Examination of hospital workers' emotional responses to an infectious disease outbreak: lessons from the 2015 mers co-v outbreak in south korea. Disaster Medicine and Public Health Preparedness, 13(3), 504-510. https://doi.org/10.1017/dmp.2018.95

Stoesser, N., Giess, A., Batty, E., Sheppard, A., Walker, A., Wilson, D., … & Joshi, S. (2014). Genome sequencing of an extended series of ndm-producing klebsiella pneumoniae isolates from neonatal infections in a nepali hospital characterizes the extent of community- versus hospital-associated transmission in an endemic setting. Antimicrobial Agents and Chemotherapy, 58(12), 7347-7357. https://doi.org/10.1128/aac.03900-14

Tago, M. (2023). Contributions of japanese hospitalists during the covid-19 pandemic and the need for infectious disease crisis management education for hospitalists: an online cross-sectional study. Risk Management and Healthcare Policy, Volume 16, 1645-1651. https://doi.org/10.2147/rmhp.s422412

Takemura, Y., Inoue, M., Ichikawa, N., Kida, R., Koyanagi, H., IkezakiRN, S., … & Ikeda, M. (2022). Key strategies for managing nursing care under the covid-19 pandemic: a multiple-case study of nursing directors. Journal of Nursing Management, 30(8), 4042-4053. https://doi.org/10.1111/jonm.13844

Tanner, C., Gans, D., White, J., Nath, R., & Pohl, J. (2015). Electronic health records and patient safety. Applied Clinical Informatics, 06(01), 136-147. https://doi.org/10.4338/aci-2014-11-ra-0099

Tebala, G., Gordon‐Dixon, A., Imtiaz, M., Shrestha, A., & Toeima, M. (2018). Enhanced recovery after rectal surgery: what we have learned so far. Mini-Invasive Surgery, 2(9), 32. https://doi.org/10.20517/2574-1225.2018.37

Tenna, A., Stenehjem, E., Margoles, L., Kacha, E., Blumberg, H., & Kempker, R. (2013). Infection control knowledge, attitudes, and practices among healthcare workers in addis ababa, ethiopia. Infection Control and Hospital Epidemiology, 34(12), 1289-1296. https://doi.org/10.1086/673979

Tshitangano, T. (2014). The practices of isolating tuberculosis infectious patients at hospitals of vhembe district, limpopo province. African Journal of Primary Health Care & Family Medicine, 6(1). https://doi.org/10.4102/phcfm.v6i1.555

Vaismoradi, M., Tella, S., Logan, P., Khakurel, J., & Vizcaya-Moreno, M. (2020). Nurses' adherence to patient safety principles: a systematic review. International Journal of Environmental Research and Public Health, 17(6), 2028. https://doi.org/10.3390/ijerph17062028

Vijitha, M. (2024). Infection control practices – problems and constraints in its implementation among registered nurses in medical wards of a tertiary care hospital in thiruvananthapuram. NJI, CXV(01), 12-17. https://doi.org/10.48029/nji.2024.cxv103

Wald, H., Bandle, B., Richard, A., & Min, S. (2014). Accuracy of electronic surveillance of catheter-associated urinary tract infection at an academic medical center. Infection Control and Hospital Epidemiology, 35(6), 685-691. https://doi.org/10.1086/676429

Wang, A., Liu, L., Zhu, J., Xue, C., Tang, S., & Xiu-juan, B. (2021). The experiences of cooperation among healthcare workers who participated in covid-19 aid mission in china: a qualitative study. Journal of Clinical Nursing, 30(17-18), 2696-2707. https://doi.org/10.1111/jocn.15774

Yoon, S., Cohen, B., Cato, K., Liu, J., & Larson, E. (2016). Visualization of data regarding infections using eye tracking techniques. Journal of Nursing Scholarship, 48(3), 244-253. https://doi.org/10.1111/jnu.12204

Zain, R., Ismail, R., Noor, S., Mohamed, M., & Samsudin, N. (2021). Developing an infection prevention and control educational program for critical care nurses:intervention mapping protocol and social cognitive theory. Indian Journal of Forensic Medicine & Toxicology, 15(4), 265-276. https://doi.org/10.37506/ijfmt.v15i4.16716

Zamberg, I., Mavrakanas, T., Ernandez, T., Bourquin, V., Zellweger, M., Marangon, N., … & Saudan, P. (2020). Management and outcomes of patients on maintenance dialysis during the covid-19 pandemic: a report from geneva, switzerland.. https://doi.org/10.21203/rs.3.rs-35053/v1

Zhang, Z., Sha, Y., Jing, F., Tang, W., & Tang, S. (2022). Analysis of healthcare workers' knowledge about vital sign zero and identify-isolate-inform (3i) system in the diagnosis and prevention of infectious diseases in chinese tertiary hospitals. Frontiers in Public Health, 10. https://doi.org/10.3389/fpubh.2022.864197

Zimolzak, A., Singh, H., Murphy, D., Li, W., Memon, S., Upadhyay, D., … & Sittig, D. (2022). Translating electronic health record-based patient safety algorithms from research to clinical practice at multiple sites. BMJ Health & Care Informatics, 29(1), e100565. https://doi.org/10.1136/bmjhci-2022-100565

saeed, F., Farooq, A., Maqsood, F., Khan, K., Ali, I., & Sartaj, M. (2020). Infection control practices in peshawar. Journal of Gandhara Medical and Dental Science, 6(2), 16-21. https://doi.org/10.37762/jgmds.6-2.94

Özer, Ö. and Şantaş, F. (2019). Effects of electronic medical records on patient safety culture: the perspective of nurses. Journal of Evaluation in Clinical Practice, 26(1), 72-78. https://doi.org/10.1111/jep.13174