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Mini Review

Empowering infection control: Harnessing the potential of education technology for effective strategies

Zahraa Al Mohsen [1,*], Eman Alharbi[2], Anfal Y Aqeeli[3], Rasmiah S Al Mutairi[4], Ahmed Radwan Mohamed[3]

[1] *Hematology Unit -King Salman Hospital, Riyadh, Saudi Arabia*
[2] *Prince Sultan Military Hospital, Riyadh, Saudi Arabia*
[3] *Directorate of Health Affairs in Riyadh Region, Riyadh, Saudi Arabia*
[4] *Western Naseem Health Center, Riyadh, Saudi Arabia*

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ABSTRACT

Infection control is a critical facet of healthcare, infection control aims to prevent the spread of infectious diseases and safeguard both patients and all healthcare workers in health care institutions. Education technology has appeared as a powerful tool for enhancing infection control practices through various innovative approaches, including online courses, virtual reality, simulation training, and mobile applications. This review article discusses the advantages of education technology in infection control, the challenges and barriers faced in implementation, and provides recommendations for maximizing its potential in empowering effective strategies. The findings underline the importance of integrating education technology into infection control programs to enhance knowledge achievement, skill development, and behavior change among healthcare professionals.

1. Introduction

Infection control guidelines practices plays a vital role in reducing the transmission of infectious diseases within healthcare facilities. With the advancements in education technology has developed as a powerful tool for empowering infection control strategies. This review aims to explore the potential of education technology in enhancing infection control guidelines practices, discussing its advantages, challenges, and recommendations for effective implementation.

2. Advantages of Education Technology in Control Infection

2.1. Online courses

It offers many advantages in the infection control, facilitating knowledge acquisition and skill development among healthcare professionals. Healthcare specialists can easily access course materials and resources at their suitability, allowing them to learn at their own pace and fit education into their busy schedules (Centers for Disease Control and Prevention, 2016). It eliminates the need for travel or physical attendance at training sessions, making them particularly beneficial for healthcare professionals working in remote or underserved areas (Roya Amini, *et al.,* 2021).[1] Additional advantage is the collaborating nature of the courses. Many platforms integrate multimedia elements, such as videos, and interactive modules, to involve

* *Corresponding author*.
E-mail address: zahralmohsen@gmail.com (Z. Al Mohsen).

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learners and promote active learning (Maja Djukic, et al 2015).[2] Online courses also offer chances for continuous professional development. In the field of infection control, where best practices are constantly developing, online courses offer a means to keep healthcare specialists up to date with the latest information (Mamdooh Alzyood *et al.,* 2020).[3] Through regular participation in online courses, healthcare professionals can continually enhance their knowledge and skills, contributing to improved infection control practices. Furthermore, online courses can support cooperative learning and group assignments foster interaction and knowledge sharing among healthcare professionals from diverse backgrounds and geographical locations (Patty Solomon and Carole Orchard 2009).[4]

2.2. Simulation training

Offers several advantages as an education technology tool in the field of infection control, providing a safe and controlled environment for healthcare professionals to practice and enhance their skills. It has the ability to recreate realistic scenarios. Simulated environments allow replicating challenging situations they may meeting in real-life infection control situations (Wendy M. Nehring and Felissa R. Lashley, 2009).[5] By simulating scenarios, the professionals can develop and refine their thinking skills, and decision-making capabilities.

Simulation training also offers immediate feedback (P Kristina Khanduja, *et al.,* 2015).[6] Immediate feedback allows healthcare specialists to share their actions and make adjustments, leading to continuous learning and improvement. Additionally, simulation training promotes a safe learning environment. Simulation allows healthcare professionals to practice these procedures without putting individuals at risk, thus confirming patient safety and reducing the potential for harm (Robertas Damaševičius et al., 2023).[7] Infection control requires matched efforts among different healthcare professionals, and simulation scenarios provide an opportunity for interdisciplinary teams to work together and practice their roles in infection prevention and control (Bosse et al., 2015).[8] Simulation training also allows for careful practice.

2.3. Virtual reality (VR)

Offers numerous advantages as an education technology tool in the field of infection control, providing immersive and realistic learning experiences for healthcare specialists. The first advantage of virtual reality is its ability to create highly realistic and engaging simulations. VR technology can replicate complex healthcare environments, such as patient rooms, operating theaters, or intensive care units, permitting healthcare specialists to exercise infection control procedures in a realistic and immersive manner (Omori K, et al., 2023).[9] This realism enhances the transfer of knowledgeand skills from the virtual environment to real-world practice. Healthcare professionals can interact with virtual patients, medical equipment, and infection control resources, actively applying their knowledge and skills to solve infection control challenges (Mi Yu, and Mi Ran Yang 2022).[10] This energetic appointment promotes critical thinking, decision-making, and the integration of infection control guidelines into daily practice. Furthermore, virtual reality provides a safe learning environment. Infection control procedures often involve risks to patients and healthcare professionals. VR simulations allow healthcare professionals to practice high-risk procedures, such as personal protective equipment (PPE) donning and doffing, in a safe and controlled environment, reducing the potential for errors and adverse events. Through shared VR experiences, healthcare professionals from different disciplines can engage in cooperative decision-making, communication, and teamwork, simulating realistic interdisciplinary scenarios (Sebastian Rutkowski et al., 2019).[11] Healthcare specialists can engage in repeated VR simulations, allowing them to refine their infection control techniques, reinforce best practices, and build muscle memory (Lan Li et al., 2017).[12,13]

2.4. Mobile applications

The advantage of mobile applications is their capability to provide real-time access to infection control protocols, and different educational resources. Healthcare professionals can have immediate access to up-to-date information on best practices, outbreak alerts, and guidelines from reputable sources (Centers for Disease Control and Prevention, 2016).[14] This timely access supports informed decision-making and facilitates adherence to infection control protocols. Mobile applications also facilitate self-assessment and knowledge reinforcement. Many applications offer interactive case studies, and different learning experiences, allowing healthcare specialists to test their considerate of infection control and identify areas for improvement (Rebecca Schnall et al., 2015).[15] This support enhances the efficacy and accuracy of infection control practices in various clinical settings. Professionals in Healthcare settings can access educational resources and reference materials at their fingertips, regardless of their physical location or time constraints. This flexibility allows professionals to engage in self-directed learning and review infection control content whenever and wherever it is most convenient for them. Mobile applications can support communication and association among healthcare professionals. Some apps include features such as chat functions, or social networking that facilitate knowledge sharing (Kati Anneli et al., 2014).[16]

3. Challenges and Barriers in Implementation

Despite the numerous advantages offered by educational technology tools in the field of infection control, there are numerous challenges and barriers that can hinder their effective implementation. Understanding and addressing these challenges is essential for successful incorporation of educational technology in infection control education.

3.1. Technological infrastructure and access

In some healthcare facilities, limited access to reliable internet connectivity or outdated hardware can impede the use of educational technology tools. Inadequate technological infrastructure can delay healthcare ability to engage with online courses, simulation training, or mobile applications, limiting their access to educational resources.

3.2. Training and technical support

Can pose significant barriers to the implementation of the technology. The professionals may require training on how to effectively use these tools and integrate them into their practice, adequate technical support should be available to address any technical issues or challenges encountered by users during their engagement with educational technology.

3.3. Cost and resource allocation

Mainly for health facilities with limited financial resources (Larry D Gruppen et al., 2016).[17] Costs may include the development or acquisition of technology platforms, licensing fees for software applications, and ongoing maintenance and updates. Allocating sufficient resources for the integration and sustainability of educational technology in infection control education is crucial to overcome this barrier.

3.4. Evaluation and quality assurance

Evaluation and quality assurance is essential but can be challenging. Emerging healthy evaluation methods and metrics to assess the outcomes and impact of educational technology interventions is crucial. Ensuring the quality of educational content and resources available through these tools is vital to maintain high standards of education. Addressing these challenges requires a comprehensive approach that involves association among healthcare organizations, educational institutions, technology developers, and policymakers.

4. Conclusion

Educational technology tools deliver valuable opportunities to empower professionals in infection control. By harnessing the potential of online courses, simulation training, virtual reality, and mobile applications, professionals can enhance their knowledge, skills, and self-assurance in infection prevention and control. By addressing the challenges and leveraging the advantages, educational technology tools can contribute to safer healthcare environments and improved patient outcomes in the field of infection control.

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6. Conflict of Interest

None.

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Author biography

Zahraa Al Mohsen, Clinical Laboratory Specialist https://orcid.org/0009-0002-1818-1682

Eman Alharbi, -

Anfal Y Aqeeli, Clinical Laboratory Specialist

Rasmiah S Al Mutairi, Clinical Laboratory Specialist

Ahmed Radwan Mohamed, Clinical Laboratory Specialist

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