Chelonian Conservation And Biology

Vol. 17No.2 (2022) | https://www.acgpublishing.com/ | ISSN - 1071-8443

DOI:doi.org/10.18011/2022.04(1) 1090-1101

COMPREHENSIVE REVIEW OF INFECTION CONTROL PRACTICES AND EVALUATING STRATEGIES, COMPLIANCE, AND IMPACT ON HEALTHCARE-ASSOCIATED INFECTIONS IN CLINICAL SETTINGS

Abdullah Moslah Hamad Alswidan
Ministry Of Health, Saudi Arabia
amalswidan@moh.gov.sa

Ali Yahya Fhaed Alswedan
Ministry Of Health, Saudi Arabia
aalswedan@moh.gov.sa

Abdullah Hamad Shagath Al Suliman
Ministry Of Health, Saudi Arabia
aabdelieh@moh.gov.sa

Ali Mosleh Hamad Al Sawadan
Ministry Of Health, Saudi Arabia
aalsweidan@moh.gov.sa

Saif Muslih Alsawidan
Ministry Of Health, Saudi Arabia
smalsawidan@moh.gov.sa

Hamad Muslih Alsawidan
Ministry Of Health, Saudi Arabia
halsawidan@moh.gov.sa

Abdullah Musleh Mohammed Alswidan
Ministry Of Health, Saudi Arabia
aalswidan@moh.gov.sa

Hadi Musleh Mohammed Al Suwaidan
Ministry Of Health, Saudi Arabia
halswaidan@moh.gov.sa

ABSTRACT

Implementing proper infection control guidelines is an essential step in fighting against the progress of healthcare-associated infections (HAIs) in healthcare facilities. Therefore, this review comprehensively explores each option available with deep analysis and their perspective on keeping HAIs at bay. In that way, a comprehensive study of infection control measures is being made to see if they are efficient, identify critical compliance challenges, and determine patient recoveries. Discussions on methodologies for evaluating the soundness of infection control strategies follow, along with presenting some relevant proof and advice to strengthen the infection absence initiatives. The analysis findings show the significance of multipronged efforts in infection prevention and serve as a call for continued monitoring, learning, and cooperation among stakeholders for effective HAI management.

Keywords: infection management, healthcare infections, medical settings, patients' outcomes.

INTRODUCTION

HAIs as a patient safety threat remain one of the most significant problems, entailing severe morbidity, mortality, and healthcare costs as well. Infection prevention protocols such as hand washing, isolation, and reporting are inherent in patient care settings to reduce infections. The paper examines the occurrence and prevention of in-hospital infections (HAIs) and effective compliance and control methods. The literature regarding infection prevention will be reviewed to discover practical approaches and how possible it is to implement them. Problems noted in compliance will also be discussed, and suggestions to improve the patient'spatient's outcomes will be given based on this review (Sagar et. al 2023).

The toll of HAIs on the healthcare system can be hefty; patients who receive treatment in hospitals and medical facilities as a result of the course of a medical care infection usually suffer from prolonged hospital stays, increased healthcare expenditures, and, in extreme cases, die. In effect, infection control procedures are:

- The very basis for stemming the spread of pathogenic organisms.
- Ensuring patient safety.
- Maintaining the efficiency of substantial healthcare resources.

Through various strict infection prevention actions, healthcare facilities can effectively reduce the HAI threat and maintain the highest hospital standards to protect the well-being of patients.

An overview of the available literature being consolidated is the primary step of this review, aiming to find and explain effective infectious disease control measures. The measures mentioned at this moment are equally implicated in a coordinated series of actions that would seek to include the training of all staff members on the strict hand hygiene protocols, as well as on the cleaning and disinfection of the environment; the rule of informed antimicrobial

stewardship; and the surveillance systems (for early identification and containment of infectious diseases). Through the combination of practical and research findings, the critical elements of this report are perhaps the most effective plans for what to do to stop HAI in clinics.

Subsequently, the assessment of challenges that may arise in adhering to infection control protocols is also envisaged. In addition to the available evidence-guided protocols and guidelines, many healthcare institutions still need help following them, ranging from resource scarcity and staff shortages to organizational culture and the tendency to reject changes. By detailing these concerns, the review gives a comprehensive understanding of the implications of the lack of compliance with infectious disease control and the creation of proactive strategies to increase compliance and effectiveness (Sagar et. al 2023).

Besides finding reasonable solutions and identifying compliance challenges, this review aims not only to provide recommendations to help improve patient outcomes in infection control but also to provide some action steps inventors can implement. These suggestions include strategies to strengthen educational and training programs for health personnel, develop surveillance techniques using new technologies, create a culture of performance and assurance of infection control, and allocate budgetary resources to provide for the comprehensive control of disease organisms.

LITERATURE REVIEW

The literature on infection control measures is a set of multi-level approaches with various strategies for mitigating healthcare-associated infections (HAIs), from simple hand hygiene to more leveled practices like antimicrobial stewardship and surveillance systems. This review assesses their efficacy, identifies the hurdles to compliance, and explores the steps taken to ensure they are effective.

Washing hands stands at the base of infection control methods, and multiple well-known studies have been used to assess how they lower the number of HAIs. The following study has shown that by complying with the hand hygiene protocol, the passing of pathogens in healthcare settings is effectively reduced. However, although the efficiency status is clear, it influences healthcare facilities to a large extent. This inconsistency highlights the urgency of perpetual education, control, assessment, and counseling to prevent and maintain the ideals of hand hygiene among healthcare practitioners.

Such environmental cleaning and disinfection also enjoy the status of being a key player in halting the spread of in-hospital pathogens in special wards like surgical-intensive care units and operating rooms. Anterograde protocols and cleaning interventions with disinfection and removing residual flora are essential when dealing with reservoir guardians and contacts. Toward these ends, some problems are repeatedly encountered related to resource insufficiency, lack of training, and different cleaning regulations, even though protocol execution is followed correctly.

It requires a multi-faceted strategy that constitutes education and training and is tightly incorporated with the quality assurance program (Tchouaket et. al 2022).

Consequently, antimicrobial stewardship programs are the other strategic instrument for combating the emergence of both HAIs and antimicrobial resistance while, at the same time, optimizing the rationale behind using antimicrobial agents. These programs aim to modify antimicrobial prescribing practices, antimicrobial stewardship interventions, and antimicrobial resistance surveillance. Through their measures aimed at decreasing antibiotic overuse and improving antibiotic prescribing practices, the antimicrobial stewardship programs protect people from deadly multidrug-resistant pathogens, including bacteria such as Clostridioides difficile, a common bacterium associated with antibiotics that can cause severe complications.

Surveillance through the different reporting systems plays the leading role in infection control and is being carried out by monitoring trends, detecting outbreaks, and designing directed interventions. These systems can provide data on the occurrence and delivery format of HAIs, alert health facilities of epidemics, and assess infection control measures. Nevertheless, the issue of collecting data on a uniform and consistent basis is critical, and the availability of resources is a crucial component of success, as uniformity and consistent reporting criteria need universal standards. Those challenges should be organized, as a very complex system for disseminating and integrating data will require cooperation between hospitals and public health departments and advanced surveillance (Tchouaket et. al 2022).

Despite the notable technological advancements and many measures implemented to minimize infection risk, there are still several challenges to successfully controlling HAIs. Lack of finance, human resources, and required equipment creates a significant limitation for the best infection control programs. In addition to a shortfall of staff, employee loss significantly worsens the situation, resulting in a lack of coverage for infection prevention, which harms patients and their families and the medical staff'sstaff's morale. Cultural problems connected with change, resistance to applying new policies, and healthcare priorities of these clinical organizations are obstacles to infection control plans (McCauley et. al 2021).

METHODS

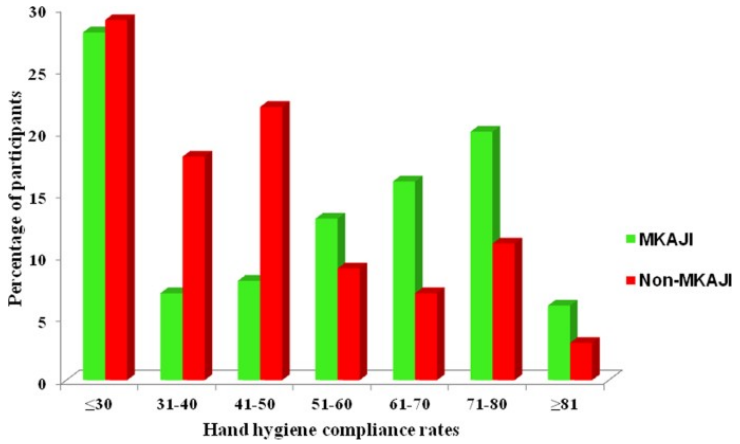
This comprehensive review has been conducted through a well-structured search of electronic databases such as Medline, CINAHL, and Scopus. Various terms are related to infection control, such as healthcare-associated infections, their prevention, and the above themes (compliance and clinical setting). These keywords help to find relevant documents in peer-reviewed journals, conference proceedings, and gray literature. The inclusion criteria comprised studies that focused on the impact of infection control plans, compliance standards, and their relationship with patient outcomes. This was based on findings in clinical settings. Data surfacing pooled together the critical information, methodology frameworks, and empirical evidence obtained from the chosen studies.

RESULTS AND FINDINGS

Examining the various infection control methods has shown us that it is a messy landscape with many strategies to be followed to reduce healthcare-associated infections (HAIs). An extensive review of available literature reveals several commendable undertakings effective in creating positive results, with some difficulties in implementation and sustainability (McCauley et. al 2021).

Hand hygiene programs have become a fundamental element of infection control, and research in the area is not surprising because many studies show that such measures help lower pathogen transmission and lessen the occurrence of HAIs. Educational initiatives, reminders, and ideas such as having hand hygiene products at hand have helped improve adherence by healthcare workers. Figure 1 maps out the effect of hand hygiene programs over time, showing a substantial decline in HAI occurrence due to the implementation of corresponding measures.

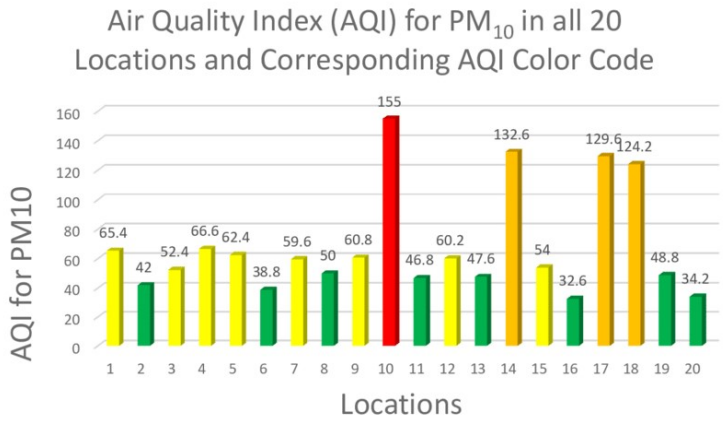
Figure 1: The impact of hand hygiene interventions on HAI rates



(Voidazan et. al 2020)

The role of environmental cleaning protocols in infection control, and likely more so in areas with a higher risk, such as ICUs and operating rooms, has become crucial. Implementing disinfection and standardized cleansing procedures has discernibly lowered the level of contamination of surfaces and decreased the chances of transmitting pathogens and introduced the improvement in surface contamination government after adopting highly advanced environmental cleaning methods commensurate with the significance of these protocols in reducing the risks of HAIs

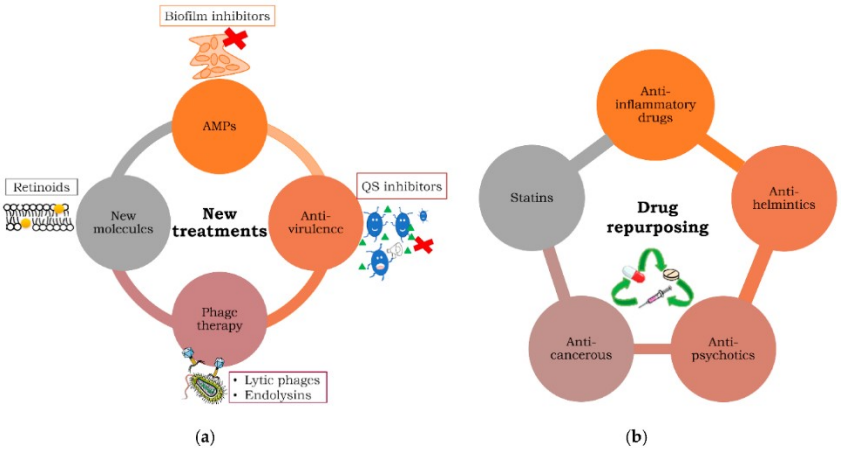
Figure 2: Increasing Air Quality Indices



(Lacotte et. al 2020).

Antimicrobial stewardship programs have considerably impacted many hospitals and healthcare facilities by ensuring rational and prudent antimicrobial use, solving the problem of multidrug-resistant microbes, and improving patient recoveries. Across healthcare facilities, careful antibiotic prescribing and applying microbial-resistance stewardship measures have resulted in notable decreases in HAI rates connected to antimicrobial drug-resistant pathogens. figure 3 shows how antimicrobial stewardship programs have led to a crucial lowering of MDR infection reports, primarily when prompt interventions and precautions are implemented every time (Lacotte et. al 2020).

Figure 3: Multidrug-resistant infections

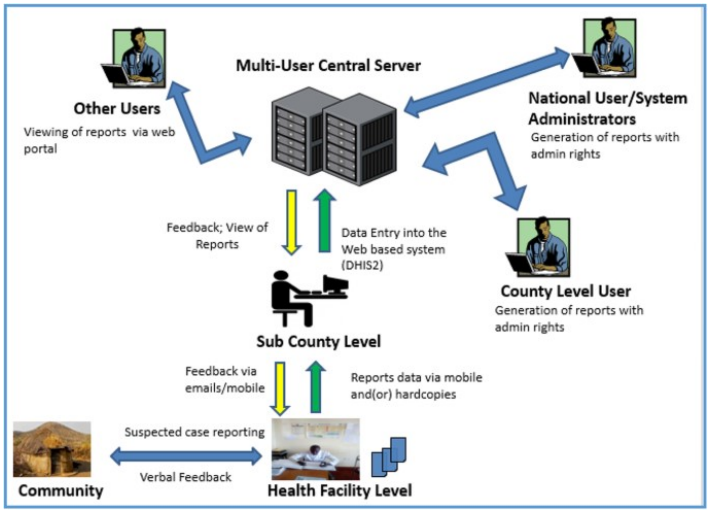


(Mouajou et. al 2022).

Surveillance systems have been proven to be the real deal in the prompt detection and timely response to HAIs, which allow healthcare facilities to monitor trends, identify outbreaks, and prompt reactions. Tools for electronic health record-based monitoring and surveillance of HAI

trends with laboratory confirmation that enable real-time tracking have facilitated data-driven decision-making. Figure 4 represents how to hold HAI outbreaks with electronic health records-based survival through early intervention based on symptoms linked with infection control (Mouajou et. al 2022).

Figure 4: Deter and Respond to HAI Outbreaks Using an EHR-based Surveillance System.



(Mouajou et. al 2022).

Even with the verified results displayed by the interventions, implementation and sustainability issues still need to be solved. Although many resource barriers exist, like the need for more workers, insufficient funding, and many other pressing priorities, there is still a high potential for introducing infection control approaches at much larger scales. Employees are a vital part of the functioning of these programs; however, sustaining employees' motivation and adherence to protocols can take time due to intense work pressure and an overwhelming list of priorities.

Thus, having analyzed a set of infection control strategies in the healthcare environment has granted exposure to their capabilities in decreasing HAIs. Hand hygiene training, environmental cleaning techniques, the proper utilization of antimicrobials, and active surveillance protocols operate on the frontlines, winning the battle between pathogens and better patient treatment. The challenge of implementation and the problem of sustainability make it clear that investing more and more support and collaboration would need to be done for the continued success of infection control in healthcare facilities(Nguemeleu et. al 2020).

DISCUSSION

The debate revives the colorful idea that infection control in healthcare is an intricate mosaic, which points to the importance of a holistic, all-encompassing approach to HAI minimization. Strict implementation of many measures, such as hand hygiene, environmental cleaning, etc., form the critical components of infection control that must be addressed to succeed in his infection prevention strategy. However, none of these steps will be effective unless the

organization has the right culture and there is leadership's commitment to and engagement of staff. Also, it demands linking several healthcare modalities, public health bodies, and community partners to manage systemic issues.

Multifield approaches that are united with diverse strategies become integral to infection control, which must be tailored to healthcare settings' challenges and specific needs. The interventions related to hand hygiene have thus proved vital in preventing pathogen transmission and developing a control strategy for microbial infections. Nevertheless, the level of hand hygiene achievement heavily depends not just on the availability of hand hygiene products but also on factors like education and training and the workplace culture in which the suggestions are made. Healthcare facilities must emphasize hand hygiene as a fundamental stepping stone to patient safety, thus promoting a culture of obedience and fulfillment of coordinated activities, continuous education, and support of healthcare workers.

As in disinfection and cleaning protocols, this is equally vital to curbing the spread of pathogens within healthcare environments. Surface decontamination and transmission reduction are the core values of standardized disinfecting approaches, which are crucial for containing the chances of cross-contamination. Although environmental cleaning initiatives are effective in ambition, their implementation is often restricted by constraints related to resources and different cleaning practices, especially those with high levels of variability. Healthcare establishments must invest enough funds in buying powerful tools, and then they should ensure that the staff receives complete training on patient room cleaning and quality control(Alhumaid et. al 2021).

The antimicrobial stewardship program is another important aspect of infection control explicitly aimed at resolving the growing problem of antimicrobial resistance. These programs develop rational antimicrobial prescription habits, allocate antibiotics best, and prevent the spread of multi-drug-resistant microbes. Although widespread implementation and durability of antimicrobial stewardship initiatives require the coordinated efforts of health organizations, top-down support, and interprofessional collaboration are vital components. Healthcare professionals should be provided with education and decision-making tools to ensure the judicious use of antibiotics. In contrast, organization leaders should identify antimicrobial stewardship as a fundamental patient safety concern.

Systemic problems like antimicrobial resistance are combated by working together across healthcare facilities, public health service agencies, and community partners. Antimicrobial resistance is a complicated and multidimensional challenge, not a single healthcare facility issue; therefore, a multi-sectoral and comprehensive approach is needed. The healthcare organizations need to ally with the primary and national public health organizations, antimicrobial stewardship programs, and community organizations to provide resistance to antibiotics among the populations. Subsequently, community engagement and education are directed toward informing the citizens about the effects of the mismanagement of antibiotics and the spread of resistant bacteria(Alhumaid et. al 2021).

In this context, the multidimensionality of infection control is a significant concern, whereas a multifaceted approach to reduce hazardous infections is emphasized. Individual tactics such as hand hygiene, environment cleaning, and antimicrobial stewardship, which form the bedrock of infection prevention, may only be effective where the organizational culture permits, leadership is willing, and staff is involved. One of the systems' problems, antimicrobial resistance, needs medical care institutes, public health agencies, and community stakeholders to get together. Healthcare system organizations can close the potential gap to stop the spreading of pathogens through the application of a comprehensive and collaborative infection-control strategy, thus improving patients' outcomes and conserving public health(Bucolic et. al 2021).

CONCLUSION

In short, implementing these protocols helps lessen HAIs and improves hospital patient safety. Wide-ranging measures are cleaning the environment, applying antimicrobials, promoting hygienic practices, and monitoring activities. Nonetheless, permanent influence and compliance are achieved through regularly monitoring healthcare professionals, providing care training, and collaboration. In this sense, hospitals reduce the incidence of infection by using related techniques and evidence-informed methods, which help provide better care practices.

RECOMMENDATIONS

- Allocate budget funds to the process of constant healthcare employees' education and training involving infection prevention directions and practices.
- Establish robust monitoring systems with feedback loops that track adherence to infection-control interventions and look for problem areas.
- Facilities clean up and disinfection should be fully resourced with adequate cleaning products and equipment.
- Support ANS based on IDC, antibiotics use surveillance, and prescription of the antibiotics.
- Create an environment of safety and accountability in healthcare institutions that reflects the administration's role in curbing the transmission of infection.

Healthcare facilities can strengthen their infection control mechanism through the actions above to prevent HAIs and improve healthcare quality. Ongoing studies and review sessions should be carried out to determine the consequences of the applied actions and address any infection prevention problems(Haque et. al 2020).

REFERENCE

Haque, M., McKimm, J., Sartelli, M., Dhingra, S., Labricciosa, F. M., Islam, S., ...&Charan, J. (2020). Strategies to prevent healthcare-associated infections: a narrative overview. *Risk management and healthcare policy*, 1765-1780.https://www.tandfonline.com/doi/abs/10.2147/RMHP.S269315

Peters, A., Schmid, M. N., Parneix, P., Lebowitz, D., de Kraker, M., Sauser, J., ...&Pittet, D. (2022). Impact of environmental hygiene interventions on healthcare-associated infections and patient colonization: a systematic review. *Antimicrobial Resistance & Infection Control*, *11*(1), 38.https://link.springer.com/article/10.1186/s13756-022-01075-1

Thandar, M. M., Rahman, M. O., Haruyama, R., Matsuoka, S., Okawa, S., Moriyama, J., ...& Baba, T. (2022). Effectiveness of Infection Control Teams in Reducing Healthcare-Associated Infections: A Systematic Review and Meta-Analysis. *International Journal of Environmental Research and Public Health*, *19*(24), 17075.https://www.mdpi.com/1660-4601/19/24/17075

Buković, E., Kurtović, B., Rotim, C., Svirčević, V., Friganović, A., &Važanić, D. (2021). Compliance with Hand Hygiene Among Healthcare Workers in Preventing Healthcare Associated Infections–A Systematic Review. *Journal of Applied Health Sciences= Časopiszaprimijenjenezdravstveneznanosti*, *7*(1), 57-69.https://hrcak.srce.hr/clanak/365606

Alotaibi, M. H., Lrouwaily, A. M. G., Alsuhaiman, N. K., Albanagi, G. M., Ahazimy, M. O., &Lhazmi, T. H. (2022). EFFECTIVE STRATEGIES FOR REDUCING HEALTHCARE-ASSOCIATED INFECTIONS: A COMPREHENSIVE REVIEW FOR NURSING
PRACTICE. *NeuropsychopharmacologiaHungarica*, *20*(4).http://neuropsychopharmacologiahungarica.com/index.php/NPPH/article/view/230

Thandar, M. M., Matsuoka, S., Rahman, O., Ota, E., & Baba, T. (2021). Infection control teams for reducing healthcare-associated infections in hospitals and other healthcare settings: a protocol for systematic review. *BMJ open*, *11*(3), e044971.https://bmjopen.bmj.com/content/11/3/e044971.abstract

Alhumaid, S., Al Mutair, A., Al Alawi, Z., Alsuliman, M., Ahmed, G. Y., Rabaan, A. A., ...& Al-Omari, A. (2021). Knowledge of infection prevention and control among healthcare workers and factors influencing compliance: a systematic review. *Antimicrobial Resistance & Infection Control*, *10*(1), 86.https://link.springer.com/article/10.1186/s13756-021-00957-0

Liu, W., Guo, T., Li, H., Zhao, Y., Zhang, K., Hai, Y., ...& Yang, Y. (2020). Healthcare-associated infection prevention and control management in a tertiary hospital and an overall evaluation. *Annals of Palliative Medicine*, *9*(4), 1536544-1531544.https://apm.amegroups.org/article/view/47016/html

Nguemeleu, E. T., Beogo, I., Sia, D., Kilpatrick, K., Séguin, C., Baillot, A., ...&Boivin, S. (2020). Economic analysis of healthcare-associated infection prevention and control interventions in medical and surgical units: systematic review using a discounting

approach. *Journal of Hospital Infection*, *106*(1), 134-154.https://www.sciencedirect.com/science/article/pii/S0195670120303327

Mouajou, V., Adams, K., DeLisle, G., & Quach, C. (2022). Hand hygiene compliance in the prevention of hospital-acquired infections: a systematic review. *Journal of Hospital Infection*, *119*, 33-48.https://www.sciencedirect.com/science/article/pii/S0195670121003418

Lacotte, Y., Årdal, C., Ploy, M. C., & European Union Joint Action on Antimicrobial Resistance and Healthcare-Associated Infections (EU-JAMRAI). (2020). Infection prevention and control research priorities: what do we need to combat healthcare-associated infections and antimicrobial resistance? Results of a narrative literature review and survey analysis. *Antimicrobial Resistance & Infection Control*, *9*, 1-10.https://link.springer.com/article/10.1186/s13756-020-00801-x

Sagar, S. S. H., Almasfuh, A. A. M., Al Abbas, T. H., Al Mansour, M. F. H., Sager, J. S. H., & Al Bahri, T. S. M. (2023). Assessing The Effectiveness Of Nursing Practices In Preventing Hospital-Acquired Infections In ICU Settings: A Comprehensive Review Of Government Hospitals. *Journal of Survey in Fisheries Sciences*, 1300-1305.http://www.sifisheriessciences.com/index.php/journal/article/view/2173

Alemu, A. Y., Endalamaw, A., Belay, D. M., Mekonen, D. K., Birhan, B. M., &Bayih, W. A. (2020). Healthcare-associated infection and its determinants in Ethiopia: a systematic review and meta-analysis. *PLoS One*, *15*(10), e0241073.https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0241073

Browne, K., & Mitchell, B. G. (2023). Multimodal environmental cleaning strategies to prevent healthcare-associated infections. *Antimicrobial Resistance & Infection Control*, *12*(1), 83.https://link.springer.com/article/10.1186/s13756-023-01274-4

Phan, H. T., Zingg, W., Tran, H. T. T., Dinh, A. P. P., &Pittet, D. (2020). Sustained effects of a multimodal campaign aiming at hand hygiene improvement on compliance and healthcare-associated infections in a large gynaecology/obstetrics tertiary-care centre in Vietnam. *Antimicrobial Resistance & Infection Control*, *9*, 1-9.https://link.springer.com/article/10.1186/s13756-020-00712-x

Clancy, C., Delungahawatta, T., & Dunne, C. P. (2021). Hand-hygiene-related clinical trials reported between 2014 and 2020: a comprehensive systematic review. *Journal of Hospital Infection*, *111*, 6-26.https://www.sciencedirect.com/science/article/pii/S019567012100102X

Puro, V., Coppola, N., Frasca, A., Gentile, I., Luzzaro, F., Peghetti, A., &Sganga, G. (2022). Pillars for prevention and control of healthcare-associated infections: an Italian expert

opinion statement. *Antimicrobial Resistance & Infection Control*, *11*(1), 87.https://link.springer.com/article/10.1186/s13756-022-01125-8

Ahmed, N. J., Haseeb, A., Elazab, E. M., Kheir, H. M., Hassali, A. A., & Khan, A. H. (2021). Incidence of Healthcare-Associated Infections (HAIs) and the adherence to the HAIs' prevention strategies in a military hospital in Alkharj. *Saudi Pharmaceutical Journal*, *29*(10), 1112-1119.https://www.sciencedirect.com/science/article/pii/S1319016421001596

Voidazan, S., Albu, S., Toth, R., Grigorescu, B., Rachita, A., & Moldovan, I. (2020). Healthcare associated infections—a new pathology in medical practice?. *International journal of environmental research and public health*, *17*(3), 760.https://www.mdpi.com/1660-4601/17/3/760

McCauley, L., Kirwan, M., & Matthews, A. (2021). The factors contributing to missed care and non-compliance in infection prevention and control practices of nurses: a scoping review. *International Journal of Nursing Studies Advances*, *3*, 100039.https://www.sciencedirect.com/science/article/pii/S2666142X21000217

Tchouaket, E. N., Kruglova, K., Beogo, I., Sia, D., Robins, S., Bélanger, E., ...&Létourneau, J. (2022). Economic evaluation of healthcare-associated infection prevention and control in long-term care: a systematic review protocol. *Systematic Reviews*, *11*(1), 261.https://link.springer.com/article/10.1186/s13643-022-02128-7

Mitchell, B. G., Fasugba, O., & Russo, P. L. (2020). Where is the strength of evidence? A review of infection prevention and control guidelines. *Journal of Hospital Infection*, *105*(2), 242-251.https://www.sciencedirect.com/science/article/pii/S0195670120300116

Cawthorne, K. R., & Cooke, R. P. D. (2021). A survey of commercially available electronic hand hygiene monitoring systems and their impact on reducing healthcare-associated infections. *Journal of Hospital Infection*, *111*, 40-46.https://www.sciencedirect.com/science/article/pii/S0195670121001043

Nadi, Z. B., Raisali, F., Jafari, N., &Bayramzadeh, S. (2023). The influence of physical environment on health care–associated infections: A literature review. *American Journal of Infection Control*.https://www.sciencedirect.com/science/article/pii/S019665532300456X