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Interprofessional Collaboration in Infection Control and Impact on Patient Safety: A Systematic Review

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ABSTRACT

Introduction: HAIs are a global and Kingdom of Saudi Arabia (KSA) health issue that is a major threat to patient safety and increases morbidity, mortality, and health care expenses. With the Saudi healthcare system being in the midst of a colossal transformation with Vision 2030, the interprofessional collaboration (IPC) as a risk-reducing mechanism has been in the limelight of the shift toward integrated and patient-centered care. Whereas the traditional infection control featured personalized adherence, the contemporary safety models highlight the concerted efforts of various departments.

Study Objective: The main aim of the systematic review will be to critically assess the role and efficacy of interprofessional collaboration (IPC) in infection control activities in healthcare facilities in Saudi Arabia. Particularly, the review is expected to determine the impact of IPC on the prevention of healthcare-associated infections (HAIs) and improvement of patient safety outcomes.

Methodology: This was done by conducting a systematic literature search according to the PRISMA 2020 recommendations in major electronic databases, such as PubMed, Scopus, CINAHL, and the Saudi Digital Library. Articles published in 2000 to 2025 that were related to multidisciplinary teamwork, infection prevention, and patient safety in KSA were taken. The quality of methods was evaluated on the Joanna Briggs Institute (JBI) and CASP critical appraisal tools. These data were synthesized thematically by using clinical outcomes, metrics of teamwork, and structural enablers...

Conclusion: Interprofessional collaboration is one of the most vital factors of infection control success and is needed to reach the safety standards of Saudi Vision 2030. Cohesive workflows/inter-departmental digital surveillance is very effective in mitigating departmental silos to minimize HAIs. In order to realize these advantages, Saudi healthcare organizations need to move towards the non-punitive just culture, institutionalize interprofessional education (IPE) within clinical programs..

KEYWORDS : *Interprofessional Collaboration, Infection Control, Patient Safety, Healthcare-Associated Infections.*

1. INTRODUCTION

Interprofessional Collaboration in Infection Control

This has required the replacement of personal knowledge by a systemic dependence on interprofessional collaboration (IPC) in the quest to achieve patient safety in the contemporary healthcare setting. In the particular case of the Kingdom of Saudi Arabia (KSA), this development is influenced by the ambitious agenda of the Vision 2030, intended to make the national healthcare environment an active and efficient system and place patients at its core. **[1], [2]** HAIs continue to be a leading risk factor to this safety goal and a major cause of extended stays, morbidity, and mortality and a big burden of financial pressure on the healthcare ecosystem. The systematic review assesses the effects of interprofessional teamwork on infection control outcomes in Saudi Arabia, summarizing the data on the role of different departments, quantitative results of decreasing the infection rate, and the organizational obstacles that determine the success of collaboration. Idealizing infection control as a team effort is based on the knowledge that the transmission of pathogens is a complex phenomenon that cannot be dealt with only by one clinical field. Theoretical frameworks, like the Input-Mediator-Output-Input (IMOI) framework, offer an opportunity to examine the dynamics of HAI prevention through the prism of the specific theoretical framework. **[6], [11]**

In this model, organizational structures and processes are taken as inputs that guide certain teamwork behaviors and cognitions that lead to the production of safety outputs. Interprofessional collaboration refers to the collaboration of professionals of various origins such as medicine, nursing, pharmacy, and support services with the patients and families to provide high-quality care based on common objectives and mutual respect. **[9]** This collaboration is based on the platform of trust, role definition, and effective communication channels. Once the synchronization of all these parts is achieved, the overall intellect of the team is greater than the aggregate of individual work, forming a system of infection prevention.

Collaboration in Saudi Healthcare in Departments

The success of an infection control program relies on the definition and combination of roles in a number of clinical and diagnostic departments. **[3]** This collaborative solution will fully secure the likelihood of each contact point of patient care against the threat of infection. The nurse is the main worker at the forefront of infection control as they are constantly at the bedside. Their duties are of wide scope of practices that include reinforcing hand hygiene, managing complex wound care and maintenance of invasive devices. **[7], [2]** Audits conducted by nurses and protocols that identify cases of HAIs early have been cited as essential in preventing most common cases, including central line-associated bloodstream infections (CLABSI) and ventilator-associated pneumonia (VAP). In addition to clinical work, nurses become the channels of communication between doctors, lab personnel, and environmental services. This is an important role especially in the initial detection of infection symptoms whereby intuition in nursing and systematic monitoring can be used to enable timely diagnostic testing and isolation. **[5], [1]**

Doctors have the charge of making major diagnostic and treatment choices that can influence the process of infection control. The correct prioritization of laboratory tests and the prompt commencement of antimicrobial treatment they require is critical in the containment of the risk of infections. **[12]** Moreover, doctors should follow strict aseptic standards when carrying out invasive treatments and surgical operations in order to reduce early contamination. Various Saudi case studies have mentioned the leadership of the so-called physician champions as an essential facilitator of the effective implementation of care bundles. The empirical contribution of laboratory departments to infection control is the quick identification of any infectious agent and the monitoring of antimicrobial susceptibility. Within the Saudi healthcare environment, clinical microbiologists work alongside infection control teams to facilitate the set up of laboratory guidelines in relation to collecting and reporting on the specimens. **[14], [15]** Laboratory-liaison communication channel ensures that clinicians get alarming notices about multidrug-resistant organisms (MDROs) and there are ability to put in place transmission-based precautions.

The use of the clinical pharmacist has become the foundation of IPC when managing antimicrobial stewardship programs (ASPs). Pharmacists liaise with physicians and microbiologists to make sure that the patient gets the correct medication at the right dose and at the right period. **[16], [17]** Such cooperation is crucial to the reduction of antimicrobial resistance (AMR) development, which is one of the major public health problems in Saudi Arabia. The sanitation of the clinical environment requires the services of environmental services (EVS). **[10]** They are assigned with the task of disinfecting high-touch surfaces as well as cleaning up patient rooms, which involves terminal cleaning of rooms. Successful IPC needs to align EVS processes to clinical treatment schedules, thereby making sure that support units become parts of the wider-team-based interventions. HAIs remain a big problem across the globe by adding to patient morbidity, mortality and health care expenses.

HAIs have been very common in Saudi Arabia and this has highlighted the importance of coming up with effective infection control measures in health care facilities. Interprofessional collaboration (IPC) has been considered an important strategy to deal with such issues through the integration of various health professionals. IPC is an interactive and collaborative effort of physicians, nurses, pharmacists, infection control specialists, and other allied health professionals in providing holistic infection prevention programs. **[5], [13], [16]**

Need of Study

Infection control is a complicated process that involves a multidisciplinary approach that cuts across individual functions. Shared practices lead to the expansion of the scope of communication, the facilitation of work procedures, and an increase in the compliance with evidence-based practices, which result in better patient safety outcomes. IPC presents a framework of overcoming barriers and maximizing infection control in Saudi healthcare institutions, where cultural, organizational, and resource factors affect clinical practice. The systematic review will be able to synthesize existing evidence on the role of IPC in infection control in Saudi Arabia, its effect in reducing HAIs and improving patient safety. This review evaluates published studies and has identified the effectiveness of collaborative interventions and indicates key facilitators and challenges of IPC implementation.

Study Objective

The main aim of the systematic review will be to critically assess the role and efficacy of interprofessional collaboration (IPC) in infection control activities in healthcare facilities in Saudi Arabia. Particularly, the review is expected to determine the impact of IPC on the prevention of healthcare-associated infections (HAIs) and improvement of patient safety outcomes. The proposed study will use the synthesis of evidence provided by various healthcare fields to determine the main facilitators, barriers, and best practices related to IPC implementation.

Research Methodology

Research Question

The research questions of the current study are:

Q1. In Saudi Arabian Health Facilitates, how does interprofessional collaboration effect infection control practices?

Q2. Has IPC had a significant reduction of HAIs in health institutions in Saudi Arabia?

Q3. What are the major facilitators and barriers for successful implementation of IPC in infection control within Saudi Arabia?

Research Design

The proposed research is based on the systematic review design, which offers the possibility of a thorough collection, assessment, and synthesis of the existing data on interprofessional collaboration (IPC) in infection control in Saudi Arabian healthcare environments. The systematic review will enable a rigorous and transparent process of finding the relevant studies, evaluating their quality, and synthesising the findings in a systematic manner to be able to give an evidence-based insight into the effects of IPC on patient safety and infection prevention. This review will identify effective collaborative practices, barriers and facilitators to IPC implementation by studying and analyzing different study designs and different healthcare settings to inform future research, policy and clinical practice enhancement efforts in the region.

Search Strategy

An extensive search strategy was used to find materials dealing with the aspect of interprofessional collaboration (IPC) in infection control in Saudi Arabia. These electronic databases were PubMed, Scopus, Web of Science, and the Saudi Digital Library, which were searched systematically using a combination of keywords and Medical Subject Headings (MeSH) terms which included; interprofessional collaboration, infection control, patient safety, healthcare-associated infections, and Saudi Arabia. The criteria were restricted to those published in the years 2000 to 2025 to obtain modern evidence. Also, the lists of the included articles and reference reviews were hand-searched to find additional relevant studies. The search was conducted in accordance with PRISMA to make it transparent and reproducible. Two reviewers independently carried out screening and selection in order to reduce the possibility of bias and inclusion of high-quality studies that are relevant to the objectives of the review.

Types of Studies Included

This systematic review entails a variety of study designs, which give empirical evidence of interprofessional collaboration (IPC) in the context of infection control in healthcare centers in Saudi Arabia. The studies eligible include quantitative, qualitative and mixed-methods studies published since 2000 to 2025. Quantitative research mostly involves observation cohort research, cross-sectional surveys, and quasi-experimental research design that determines the effectiveness of IPC interventions on infection control rates and patient safety outcome measurement. The qualitative literature investigates experiences of healthcare professionals, their perception of IPC implementation, and its impediments using interviews, focus groups, and thematic analyses. Mixed-method research embraces both of these directions to provide detailed information

about the dynamics of IPC and situational conditions affecting collaboration practices. The inclusion of different types of studies will help this review to obtain a comprehensive picture of the role and the influence of IPC in all the fields and places of healthcare in Saudi Arabia.

Keywords

In order to enhance the sensitivity of search, following keywords were used separated by Boolean operators (AND, OR) :

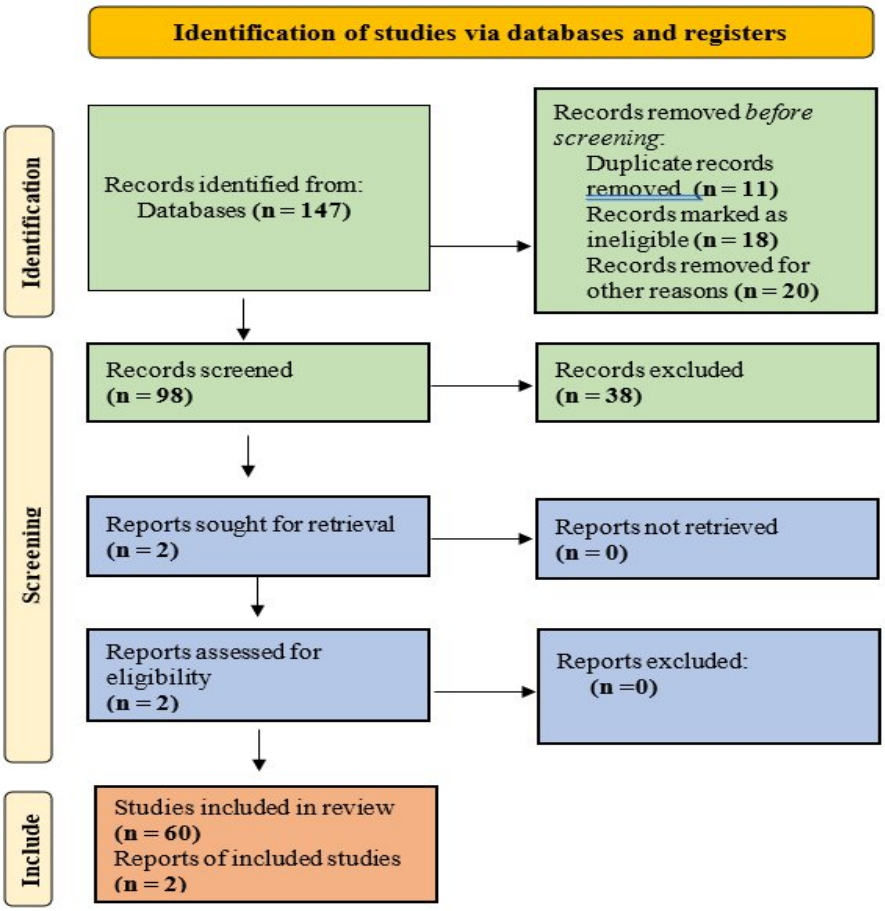
Interprofessional collaboration AND infection control AND patient safety AND Saudi Arabia OR Healthcare-associated infections AND interprofessional collaboration AND Patient safety AND infection control AND Systematic review AND Saudi Arabia NOT Non-Saudi studies

Data Management

In this systematic review, data management was done in a systematic manner to guarantee the accuracy, consistency and reliability of information that was extracted. Relevant data were systematically extracted by two separate reviewers through a standardized data extraction form taking in the eligible studies. The data extracted comprised the characteristics of studies, demographics of the study participants, IPC interventions, outcomes on infection control and patient safety. When there were differences between reviewers, either by discussion and consensus, or a third reviewer was consulted. All the data were coded and arranged with the help of the reference managing software to enable an easy retrieval and processing. This was a strict data management method that sought to reduce bias and improve the validity of the review results.

Results

A total of 147 research studies and one report was identified, the studies were evaluated as per the availability of research articles and reports, based on the interprofessional collaboration in infection control and impact on patient safety in Saudi Arabia. Out of these identified studies, 11 were removed because of duplication of records, references and location and 18 studies were marked as ineligible, as not including the above stated concept and 20 for some other unavoidable conditions.



Source: Page MJ, et al. BMJ 2021;372:n71. doi: 10.1136/bmj.n71 https://creativecommons.org/licenses/by/4.0/

Research carried out in Saudi Arabia has repeatedly shown that collaboration between different professions can improve infection prevention and patient safety. **[2], [5],[14]** Collaboration between several organizations can help nurses and doctors to improve the level of compliance with hand hygiene and antimicrobial stewardship. Infection Prevention and Control (IPC)

interventions improve the compliance rate with these two critical areas of focus, resulting in a reduction in healthcare-acquired infections (HAIs) and the subsequent use of IPC interventions. **[12]** Using collaborative infection control teams resulted in a marked reduction in the occurrences of central line-associated bloodstream infections (CLABSIs), ventilator-associated pneumonia (VAP), and surgical site infections (SSIs). **[9], [19]** Collaborative teams also improve healthcare communication between providers, which prevents errors in providing care, strengthens reporting systems for incidents related to infection or adverse outcomes, and creates an open, collaborative environment.

There are a number of cultural and organizational factors (e.g., leadership support, ongoing professional development) that are essential to the success of IPC efforts. Nonetheless, there are numerous challenges to high-quality IPC collaboration, including hierarchical organizational structures and resource limitations. **[17]** The results of these studies support the need for continued investment in IPC frameworks in order to improve patient outcomes and quality of care in Saudi Arabia.**[21], [22]**

Discussion

Metrics of Collaboration

The shift toward the use of interprofessional collaboration in Saudi hospitals has paid off in terms of measurably improved patient safety indicators. The effectiveness of tertiary center team-based care bundles is evidenced by data published by large hospitals (King Abdulaziz Medical City (KAMC) and King Faisal Specialist Hospital (KFSHRC)). The use of care bundle-based multidisciplinary teams has especially been effective in adult intensive care units (ICUs). **[15], [7]**

An example can be given of KAMC-Jeddah which in 2008 started a project to decrease the CLABSI rates, which were initially registered as 2 per 1,000 line days. **[6]** The facility was able to reduce the 0.7 per 1,000 line days to 0.7 per 1000 line days with the concept of forming a multidisciplinary CLABSI elimination team that included the intensivists, infection control practitioners, and the ICU nurses in 2010. **[2], [7]** This was due to the 100 percent adherence to the IHI Central Line Bundle which ultimately resulted into longer durations of zero CLABSI incidences. Equally, a CAUTI prevention project in terms of patient safety and quality improvement had a reported decrease in CAUTI, which was 1.28 per 1,000 catheter days to 0.42 per 1,000 catheter days after the intervention. The focus of this project was on the combination of efforts between healthcare providers, patients, and families. **[14], [15]**

Interprofessional ASPs have shown to be very successful with regard to mitigating improper antibiotic use and expenditure in Saudi hospitals. An intervention of evaluating meropenem compliance reported that interdisciplinary interventions had a better result compared to 2022 median overall compliance of 85.7% and 2023 of 100%. **[17]** This was a direct clinical improvement that was directly proportional to patient outcome including a strong upward trend in the proportion of patients being discharged in good clinical condition.

The clear inverse relationship between the quality of teamwork and the number of safety incidents has been determined by quantitative assessment with the help of standardized instruments such as the Team STEPPS Teamwork Perceptions Questionnaire (T-TPQ). **[21]** In a cross-sectional study of 400 Saudi healthcare workers, it was found that units with the highest quartile of teamwork scores reported much lower incidents (mean = 3.2 per 1,000 patient-days) than units in low quartile (mean = 7.8 per 1,000 patient-days). **[9], [22]** The multiple regression model suggested a significant correlation between teamwork and communication score to explain 48% on the incident reporting rate. **[23]**

Standardized Protocols

The IPC is successful in the Saudi context and it is mediated by a number of collaborative mechanisms which help in exchanging information and synchronizing clinical activity. Standardized tools of communication play a very important role in minimising mistakes in handovers and high risk procedures. Situation-Background-Assessment-Recommendation (SBAR) framework has gained a lot of popularity in Saudi hospitals as a means of professional exchange. There is evidence that SBAR implementation can help to diminish the number of errors caused by communication by 25%. **[12], [9],2** Also, training schemes such as TeamSTEPPS have been advocated to improve team performance especially in high risk divisions like ICUs and emergency departments.**[7]**

Care bundle development and implementation is a high-yield interprofessional intervention. Evidence-based measures, including aseptic practices, determining why a device should be used daily, and applying maximum sterile precautions, are usually a part of care bundles focused on CLABSI and CAUTI. **[6], [8]** These bundles should be effective, which in turn requires interprofessional compliance; the implementation of nurse-led catheter removal schemes in the latter case would rely on physician support and role confusion resolution. The digital integration has turned into an essential part of the Saudi IPC environment. The Healthcare Electronic Surveillance Network (HESN) enables the reporting of infectious diseases on a national level and interprofessional responses to outbreaks. In the facilities, real-time data sharing between clinicians, infection preventionists, and other personnel in the laboratory enables coordination of interventions based on the emerging trends of resistance or infection clusters. **[14]**

Nurturing of a Safety Culture

IPE entails interdisciplinary learners acquiring knowledge in various fields of healthcare as a means of cultivating a team

spirit mentality before they qualify into clinical practice. The Saudi Arabian situational analyses indicate that there is an increasing evidence base on IPE application, and most of the studies indicate that students and faculty have positive attitudes towards collaborative learning.**[3]** The evaluation of these programs has been done through tools like the Readiness to Interprofessional Learning Scale (RIPLS) which defines Central Saudi Arabia as a hub of IPE research. **[7]**

Nevertheless, there are still loopholes in the structural implementation of IPE. According to recommendations made by national workshops, patient safety should be integrated in all levels of health education and to develop hands-on skills, simulation-based learning should be implemented and reflective journals should be used. **[11], [4]** The systematic reviews of patient safety KAP among Saudi professionals reveal that training and experience are the most significant predictors of the improved safety outcomes. Nurses seem to be much more practical in their involvement in the safety principles than other groups, and the administrators and midwives are underrepresented in the study. One of them is the so-called knowledge-to-practice gap, in which professionals express positive attitudes and moderate levels of knowledge but cannot address the idea of lack of consistent safety measures because of organizational impediments. **[22], [2], [21]**

Issues and Challenges

Historically, healthcare has been run through formal or informal hierarchies in which particular professions are supposed to be submissive to others, including nursing submissiveness to physicians. This may create a situation of physician pushback against nurse-initiated protocols or hesitation of junior staff to report mistakes. The problem of role ambiguity also complicates the cooperation, because ambiguity in the professional boundaries may result in discontinuous care and inconsistent compliance with the infection control procedures. **[23]**

Although formal communication has been essential, such as meetings and emails, research within the hospitals of the Saudi MOH has revealed that there is a common use of informal communication tools such as WhatsApp to conduct business. Such professional insufficiency may result in overloading of information, absence of clear documents as well as reactive and not proactive crisis communication. Saudi healthcare system depends on expatriate nursing labor force considerably, and it unites people of different cultural, language, and educational backgrounds. Such diversity may cause communicational barriers, work culture differences, and unconscious prejudices that do not facilitate team unity and interactions between patients and providers. **[22], [23]**

Punitive reporting systems are a common obstacle that is reported in systematic reviews. Organizations that do not tolerate mistakes with blame instead of analysis of systemic causes of the issue hinder open communication required in safety culture.

Conclusion

The systematic synthesis of evidence regarding interprofessional collaboration in infection control in Saudi Arabia indicates that it plays a critical role in improving patient safety and reducing morbidity associated with health care. The evidence indicates that when clinical, diagnostic, and supportive units operate in a systematic collaborative manner; use of standardised communication tools and strong leadership; there is a significant decrease in device-related infections and inappropriate use of antibiotics. Many of these findings can be leveraged to support goals outlined within Vision 2030. Therefore, it is recommended that Saudi Arabia implement several key strategic actions. The first action requires that Saudi Arabian healthcare institutions transition away from "punitive" reporting models toward a "just culture" where there is a focus upon organisational learning and the ability to report on near-misses. The second action requires that interprofessional education be moved away from the periphery of health profession curricula and be placed at the centre, with emphasis placed on simulation-based learning, team-driven skills and competencies. Finally, to eliminate ambiguity surrounding the role of various disciplines in health care, nationally unified policy frameworks that define the authority and accountability of multidisciplinary teams, particularly those led by nurses, need to be developed.

Future Scope of Study

This study has the potential to expand the understanding and implementation of IPC in infection control across Saudi Arabia. As healthcare systems continue to change, there is an urgent need to investigate new IPC models that utilize new technologies (e.g., digital communication) and data analytics to support real-time collaboration and decision-making among healthcare professionals. Other research areas will include assessing the long-term impact of IPC interventions on both HAIs and patient safety, as well as the impact of culture, organization, and policy issues on the ability of healthcare professionals to effectively use IPC in their daily work..

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