

Infection Control Knowledge And Practices Among Nurses, Emergency Department Staff, Radiology Technicians, Dental Technicians, Pharmacy Assistants, And Laboratory Professionals

Sattam Zaid Alanazi¹, Nawal Yousef Mohammed Hannawi², Naelah Yousef Mohammed Hannawi³, Ali Mohammed Almomen⁴, Hani Abdulaziz Suliman Alshubrumi⁵, Ahmad Fedhi Sewileh Alresheedi⁶, Mujahed Falah Alkhudari⁷, Maha Jubayr Aqeel Aldhafeeri⁸, Awadh Abdullah Suhil Alanazi⁹, Majed Marzoog Alenazi¹⁰, Majed Saud Ghannam Alenzy¹¹, Ilin Mohsen Muttalib Alshammari¹²

¹Emergency Medical Specialist, Saudi Red Crescent Authority, Riyadh

²Laboratory Specialist, King Abdullah Medical City, Makkah, Makkah Heath Cluster, Makkah Almokaramah

³Laboratory Technician, Alnoor Specialists Hospital, Makkah Almokaramah, Makkah Heath Cluster

⁴Internal Medicine Cardiology, Qatif Central Hospital, Eastern Health Cluster

⁵Pharmacist Assistant, Al-Qadisiyah Health Center in Al-Bukayriyah, 2025

⁶Nursing, Uyun Aljawa General Hospital

⁷Speciality, General Dentistry, King Salman Hospital

⁸Technician-Dental Assistant, Dental Center,

⁹Technician Emergency Medical Services, Ministry of National Guard, Health Affairs, National Guard Fire Unit in Riyadh, Riyadh

¹⁰Pharmacist, Johns Hopkins Aramco Health Care Hospital, Dhahran Saudi Arabia

¹¹Radiology Specialist, Security Forces Hospital Program, General Directorate of Medical Services, Ministry of Interior, Riyadh, Saudi Arabia

¹²Nursing Technician, King Salman Specialist Hospital

Abstract

Background: IC and HAI are two important areas in the field of patient/healthcare worker safety that have been the cornerstone with which the challenges are continually raised in renewed attention and renewed focus. The formation of effective IPC programs is a task that is not only the domain of a particular sector but also the collective awareness, attitudes, and practices by a diversified group of professionals. The systematic analysis in the following study will examine a closer analysis of the IC capability of six groups of professionals. These include nursing professionals, emergency care workers in the ED department, radiologic imaging technicians, dental health care workers (DHCWs), pharmacy assistants, and laboratory workers.

Methods: The six groups of professionals have been studied using a set of descriptive and observational studies that have been carried out in the time frame 2019-2025, with geographical distribution in Kenya, Kingdom of Saudi Arabia, and Egypt. The trend analysis suggests a disturbing consensus among the six groups of professionals regarding the mismatch in awareness and the practicality in the everyday approach to IC. The analysis also suggests some areas in which the approaches are poor.

Results: Such common drivers include the fluctuating nature of training/education in an endless stream of continuous competence; physical and policy resource deficits; and the absence of adequate means of communication between the departments. This review contends that in order to overcome the aforementioned deficiencies, there has to be a paradigm shift in the form of an IC strategy that is multidisciplinary in its chosen approach. This will have to include competency training tailored to specific roles; strict policy implementation, including standard compliance and 'auditability' across the board in every department; the use of health informatics in real-time monitoring and communication; and the promotion of an institutional 'safety culture'.

Conclusion: This article provides an outline of an effective approach to the gamut of infection prevention, as it were, in the form of a comparative outline in the tables presented above. The article's main intention in this regard has been to offer an evidence-based framework regarding the nature of an effective IC strategy in order to contribute toward the improvement of the current paradigm.

Keywords: Infection control, Health care-associated infection, Multidisciplinary collaboration, Knowledge/practice gap, Hand hygiene.

1. Introduction

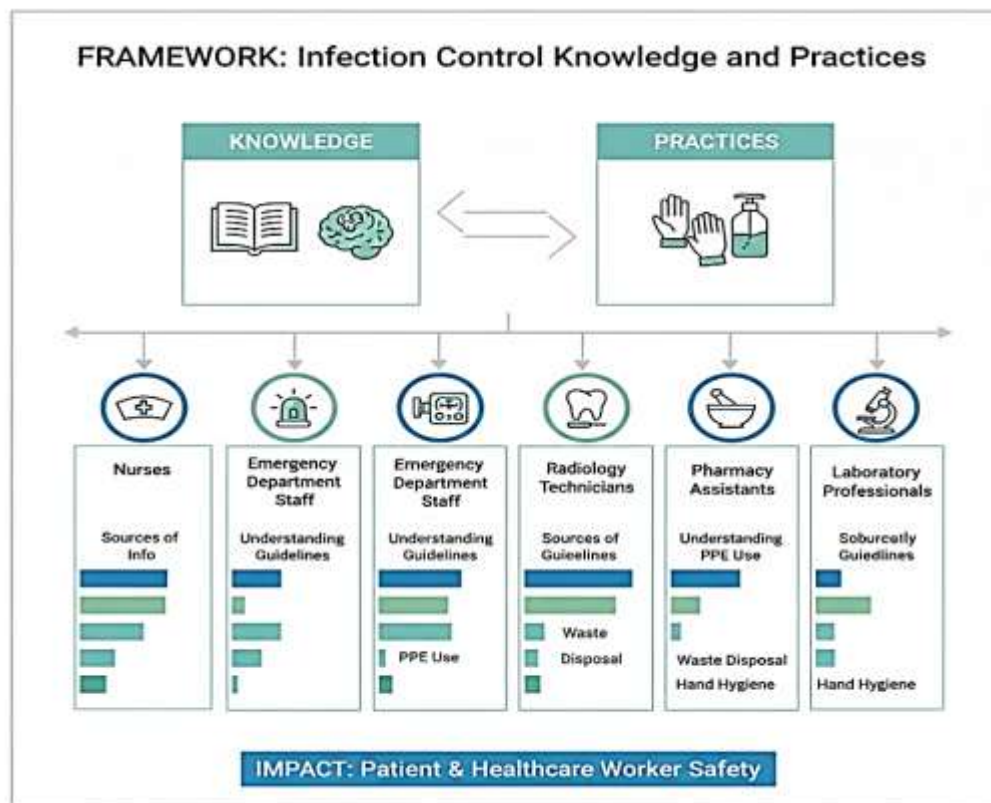
Healthcare-associated infections (HAIs) pose a serious threat to the well-being of the global populace and form a significant linkage in the causation of morbidity and mortality and the ensuing increased costs in the healthcare industry. HAIs are preventable in nature and form a serious pointer in the event of system failures in the aspects pertaining to the implementation of infection control practices (World Health Organization (WHO), 2021). Moreover, the impact of HAIs is not only witnessed in the causation of morbidity and mortality in the healthcare system but also affects the healthcare professionals employed in the system (healthcare workers (HCWs)) and poses a serious threat to the budgetary resources allocated for the healthcare sectors. With advancements in the healthcare industry setting and the speeding healthcare system in the present era, the implementation of IPC is no longer the sole responsibility of the IPC committee or the professionals in the healthcare industry.

Although international organizations such as WHO and CDC have fully defined and scientifically supported IPC guidelines, there still exists a wide schism in the adherence rates of IC when put into action. The mentioned schism does not stand at a normalized index; instead, it differs based on geographical resource settings, respective professional groups, and other institutional affiliations. Recent investigative literature has begun to profile this irregular topography of IC adherence, taking a snapshot of the HAI of respective groups of HCWs. For example, an investigation in Kenya's dental health care professionals revealed extreme gaps in sterilization practices and the usage of eye protection (Butt et al., 2019). On the other hand, an investigation was conducted in a Saudi Arabian ER's IC infrastructure, reporting excellent support infrastructure for IC adherence but a non-unified index regarding self- vs. actual HCW adherence levels (AlAnazy & Ahmed, 2024). The nursing staff at the Egyptian dental clinics showed overall adequate nursing practice, but the surprisingly low usage rate for protected eye care was a concern (Soliman, Abd El-Aziz, & Elsayed, 2022). The futuristic literature review defines the perfect scenario as one in which the entire healthcare environment is a well-integrated whole, where dentistry, nursing, medicine, radiation, laboratories, pharmacy, and information management are "harmoniously intertwined and working together as a unit to overcome the chain of infection" (Almutairi et al., 2025)

This article distills insights from these and similar bodies of research to comparatively examine competency in IC from a multidisciplinary perspective. Rather than focusing on "healthcare workers" in general, this article will examine—not to dissect but to highlight—the specific roles, challenges, and compliance rates of six specific categories of professionals involved in the IPC continuum: nurses (acting as frontline implementers), emergency department staff (working under high-risk and unpredictable conditions), radiologic technicians (coordinating mutual use of high-touch equipment), dental hygiene techs (working with aerosol-generating procedures), pharmacy assistants (focusing on sterile preparation and antimicrobial use), or lab workers (interfacing with sources of pathogen-based diagnostics).

By opposing these strengths and weaknesses, it is hoped that not only can barriers for each particular role be discovered, but also that failures that occur at an institutional level can be uncovered. Ultimately, it is hoped that such information can be used for the creation of targeted intervention efforts that not only promote IC patient safety but also can fortify healthcare systems against infection.

Figure 1: Study framework



2. Methods

This article adopts a narrative review to integrate and critically discuss what is currently known about infection control (IC) knowledge and practice among major health care practitioners. This article operates in a macro manner to identify where themes co-exist, diverge, or appear in different health care settings.

2.1. Search Strategy & Study Selection

The analysis will concentrate on four recent studies about specific issues, which are representative and have tangible findings. They are:

1. Descriptive cross-sectional study among 110 dental health care providers at a dental hospital in Kenya (Butt et al., 2019).
2. 100 nursing staff of government dental centers and health units in the governorates in Descriptive cross-sectional study conducted on of in Egypt (Soliman et al., 2022).
3. 106 nurses in the Emergency Department of King Khalid Hospital in Hail, Kingdom of Saudi Arabia in quantitative descriptive and correlational study among (AlAnazy & Ahmed).
4. the essential role of nine hospital departments, ranging from dentistry to radiology, laboratory, pharmacy, in a collaborative IC environment were used to do the assessment and framework analysis (Almutairi et al., 2025). These key studies are reinforced with citations and evidence extracted from the Bibliography, in accordance with the WHO and CDC recommendations.

2.2. Data Extraction and Synthesis

We systematically retrieved relevant information from the selected studies, organizing it in a structured manner, categorizing it by professional groups, and concentrating on a few key themes:

- The population under study, geographic location, and size of sample.
- What was tested in terms of knowledge as far as the results and where the strengths and weaknesses appear.
- What was reported and observed regarding practices, specifically the effectiveness of the infection control measures: hand washing, the usage of personal protective equipment, and sterilization methods.

- Training and infrastructure: availability of training on infection control practices. Correlations: the relationships between knowledge levels and practices and other factors. The data was organized by professional type, theme by theme. Trends were sought among the professional groups - the persistent gap between knowledge and practice, for instance, or differences between the barriers in the dental clinic and the policy context in the Saudi emergency department. A narrative presentation is used for the findings; comparison tables help highlight the findings.

2.3. Limitations

This article is not trying to be the end-all review. These findings have come from carefully picking a few studies and have been skewed by the environments in which these studies took place. These sources could also have skewed findings through self-reporting, which could have led to an exaggerated number regarding the number of people following the guidelines.

3. Results

What does emerge from the evidence is that there is patchy competency levels for infection control (IC). There could be some glimmer of excellence in basic understanding, but these can be offset by deficiencies in down-to-earth know-how. In other words, there is an understanding of infection control concepts, but their proper execution is hindered.

3.1 Nurses: The Frontline with

In fact, nurses still represent the biggest group responsible for IPC work. However, the effectiveness of the “final common pathway” among nurses is variable.

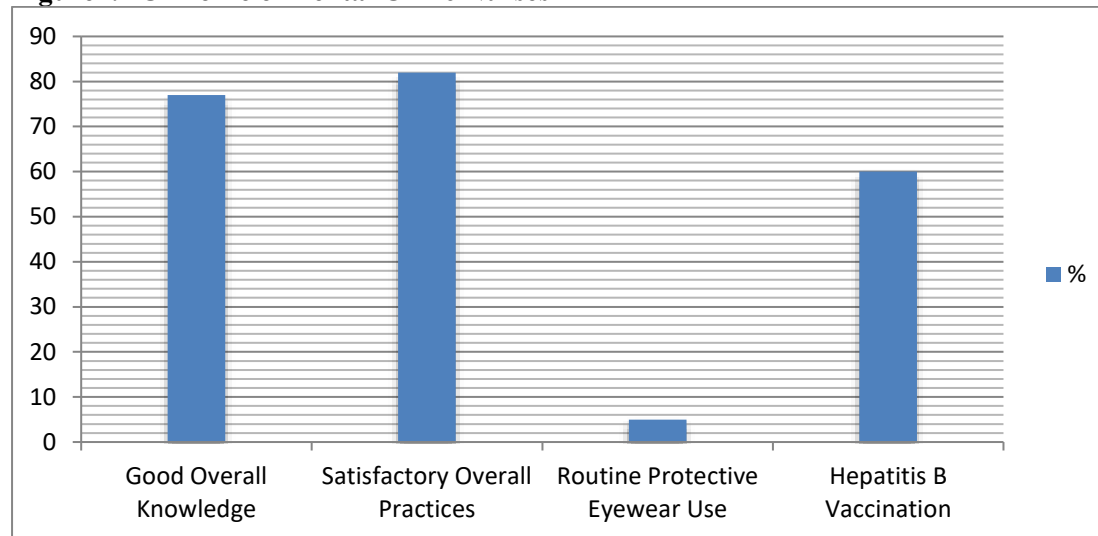
3.1.1. Dental Clinic Nurses:

Soliman et al. (2022) paint a “very hopeful” outlook with 77 out of 100 nurses assessing “good” IC knowledge and “satisfactory” practices being displayed by 82%. Yet, the details are alarming regarding the risky transmission gaps. Alarming, the use of protective eyewear was practiced only by 5%. The medical procedures in dental clinics are an aerosol-producing process, thus underestimating the transmission risks leaves these nurses more vulnerable to the threat of contagious infections such as TB, Influenza, or SARS-COVID. Moreover, Hepatitis B vaccination was acquired only in 60%, which poses an alarming risk regarding exposure protection. This weakness bypasses the role of an already validated, evidence-based safety measure. Interestingly, there was an inconsistency between individual understanding and professional educational levels, although a connection existed regarding individual exposure experiences ($p \leq 0.001$). The finding suggests that individual knowledge is gained after an exposure experience which fails to offer full preventive training concerning possible events.

Table 1: IC Profile of Dental Clinic Nurses (Soliman et al., 2022; n=100)

Variable	Result	Implication
Good Overall Knowledge	77%	Theoretical understanding is generally adequate but may lack critical depth.
Satisfactory Overall Practices	82%	Self-reported or broadly observed compliance masks severe specific deficits.
Routine Protective Eyewear Use	5%	Critical gap in protection against aerosols and splashes, indicating a profound misperception of risk.
Hepatitis B Vaccination	60%	Suboptimal uptake of a fundamental, life-saving occupational vaccine.
Positive Knowledge-Practice Correlation	$r=0.330$, $p=0.001$	Reinforces that improving knowledge is a necessary, though not sufficient, step to improve practice.

Figure2: IC Profile of Dental Clinic Nurses



3.1.2. Emergency Department Nurses:

In the ER setting, the IPC is not a soft target for those who cannot handle the pressure. It is an environment where every minute counts and where patients can just disappear despite the best care. Infection control is an extremely realistic and concrete issue for nursing. In the research by AlAnazy & Ahmed (2024), the structure appeared sound so far as the top was concerned because 79.2% of the ER nursing personnel had “access to an established training curriculum,” 82.1% had “unit-related IPC guidelines,” and 82.7% had “an active hospital-wide IPC team.” However, such a robust structure is not necessarily reflected in the reality of the environment. This is evident because, contrary to what would be expected in a setting where such an issue is so prevalent as infection control and where so many of the personnel were trained on some sort of initiation regarding such a topic, just 46.2% were of the opinion that “all personnel adhere to the guidelines.” This lack of adherence to guidelines implies the kind of confusing environment presented by the combination of the environment and patient needs under pressure. Because over three-quarters of the ER personnel received some form of training for the issue, the issue of how such training is conducted and the effectiveness of the training in bringing about safe and good compliance under pressure is dubious.

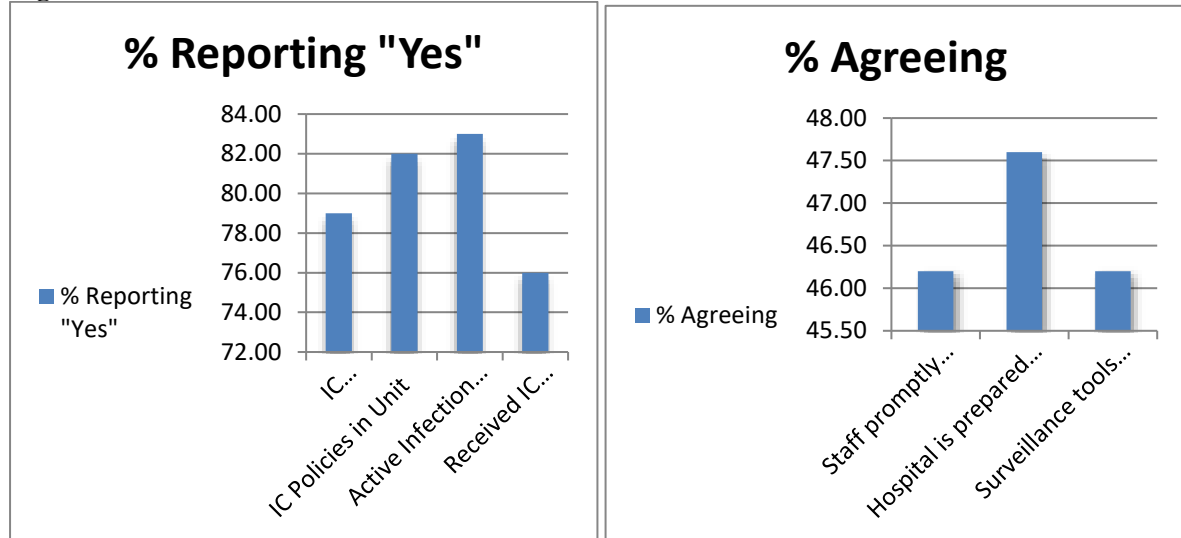
Table 2: IC Infrastructure vs. Practice in the ED (AlAnazy & Ahmed, 2024; n=106)

Infrastructure & Training	% Reporting "Yes"	Perceived Compliance & Preparedness	% Agreeing
IC Curriculum/Training Available	79.2%	Staff promptly follow IC policies	46.2%
IC Policies in Unit	82.1%	Hospital is prepared for an infection outbreak	47.6%
Active Infection Control Team	82.7%	Surveillance tools are effective	46.2%
Received IC Training/Orientation	76.4%		

3.2. Dental Healthcare Workers (DHCWs): High Risk, Inconsistent Defense

The dental operatory remains one of the most fragile corners of the world of the ICU. A 2019 study by Butt and colleagues in Kenya reveals the ways in which basic safety habits can be shaky. Even while everybody said they wore gloves and masks, only about 5% regularly protected their eyes with goggles. That pattern echoes a prior Egypt example and hints at a troubling, growing global blind spot when it comes to proper dental infection control.

Figure 3: IC Infrastructure vs. Practice in the ED



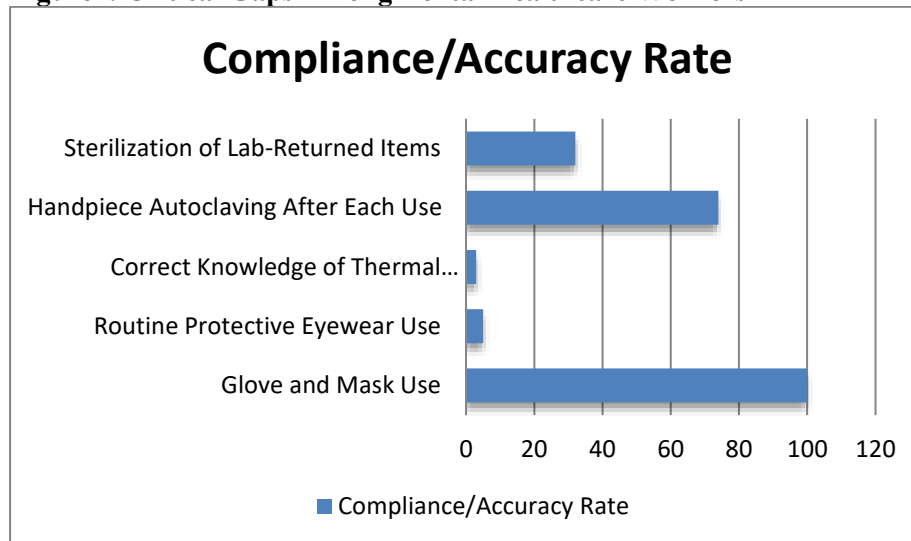
Even more disturbing, however, is the abysmal lack of sterilization knowledge: a full 3% of participants were able to state the basic thermal sterilization parameters-time, temperature, and pressure-for autoclaving. Ironically, this knowledge gap actually appeared to carry over into practice: fully 74% of instruments were steam-sterilized between every patient use, with the remainder receiving various dubious chemical wipe-downs.

There is also a clear route for cross-contamination. Although 90% of impressions were sent for sterilization before proceeding to the laboratory, when the items came back from the laboratory, only 32% were sterilized. This massively increased the chance that any lurking infections would re-enter the clean zone.

Table 3: Critical Gaps Among Dental Healthcare Workers (Butt et al., 2019; n=110)

Practice/Knowledge Area	Compliance/Accuracy Rate	Standard Requirement & Implication
Glove and Mask Use	100%	Met - Adherence to this part of Universal Precautions is established.
Routine Protective Eyewear Use	5%	Severely deficient - Leaves practitioners vulnerable to ocular exposure and respiratory aerosols.
Correct Knowledge of Thermal Sterilization	3%	Critical deficiency - Practice without understanding is ritualistic, unmonitored, and unsafe.
Handpiece Autoclaving After Each Use	74%	Suboptimal - 26% of patients are exposed to potential cross-contamination from handpieces.
Sterilization of Lab-Returned Items	32%	Major system gap - Breaks the chain of asepsis, negating prior sterilization efforts.

Figure4: Critical Gaps Among Dental Healthcare Workers



3.3. Radiology Technicians:

Guardians of a Vulnerable Imaging Chain “Radiology is always the quiet weak link in infection control” This is an environment in which the probability of contamination is always high and the design of the equipment is meant to promote a fast turnaround, which, in turn, makes it even more difficult to clean the equipment. The work of IC remains in the background most of the time. Most IC “best practices in IC essentially translate to the following: imaging surfaces and consoles must be immaculately cleaned; there must be good use of appropriate personal protective equipment in intervention studies; when possible, the imaging suites should be isolated for patients with contagious diseases; and there must be prudent care of the injector contrast systems. “IC training should not be this iffy “.This should not be the case, since there is no requirement to train the personnel in the imaging room in IC, compared to nurses and surgeons.

3.4 Pharmacy Assistants: The Silent Guardians of Medication Safety

The pharmacy provides the hospital community with two completely necessary functions that are frequently behind the scenes. First, the pharmacy is involved in the preparation of the aseptic IV solutions, total parenteral nutrition, and oncology therapies in ISO-class clean rooms. One mistake in these clean rooms can mean total pandemonium, originating in hospital-acquired sepsis and escalating to whole-body chaos within the hospital and community settings, including the whole health care structure and all associated institutions. Second, the pharmacy community fights the escalating problem of AMR, now identified as one of the principal causes of hospital-acquired sepsis and thus whole-body chaos within the hospital setting and community.

3.5. Laboratory Professionals: The Diagnostic Frontline with Intrinsic Risk

Labs are where you are standing at the cutting-edge frontiers of finding pathogens, but they are also the danger that we willingly walk into every day. Biosafety is not something that you can safely avoid, something that you don’t have to do, but is a necessity. You have to think about it in terms of a set of tools: you have the right biosafety cabinets for procedures that generate aerosols, safe transportation of samples that don’t leak, decontamination protocols for your instruments, and proper segregation and disposal of bio-medical wastes. Lab infections that people acquire could be considered rare, but are actually a potential hazard that could put the whole hospital at risk, especially if steps aren’t followed due to workload pressures, a possible absence of the proper biosafety levels in the case of a hospital. Lab functions also include antibiotic susceptibility testing, also referred to as antibiograms.

4. Discussion

“ What the data show is alarming,” the following explains, “because they reflect a general, universal pattern in which what people know theoretically is not the same as what they do in practice.” A gap is evident between the knowledge of personnel in the health-care sector and what they do.

4.1. The Knowledge-To-Practice Gap in Detail:

A Multifactorial It is well understood that the known-doing gap is significant and is influenced by so many factors. For instance, dental practitioners wear gloves to protect themselves from the risk of infection. In fact, dental practitioners wear gloves to protect themselves from the risk of infection. However, they fail to wear protective shields to protect themselves from the risk of saliva or aerosol transmission (Butt et al., 2019; Soliman et al., 2022). In hospital emergency departments, nurses understand the training received regarding the prevention of infections. However, the work environment deters the application of that knowledge (AlAnazy & Ahmed, 2024). In fact, more alarming is the reality that dental health care providers' knowledge about sterilization practices is poor (Butt et al., 2019). All these aspects remain sustained through a multitude of factors including:

Deficient Training Models: Training is often infrequent, lecture-based, and generic. Free-form rewrite:

Inadequate Training Models: Training is presented in the classroom and is standardized. Training is rarely experiential or competency-based or aimed at the individual's role. It is far from that important transition from knowing to doing. Simulation regarding high-pressure areas such as the ED or the specifics involved in sterile compounding is not achieved.

Chronic Resource Challenges: The most immediate type of constraint is a lack of compliance because of a lack of resources. This would include a lack of PPE, including specialized PPE such as N95 respirators and eye protectors. The lack of biological indicators used to confirm sterilization and lack of operational autoclaves/HEPA filters could also be included. A lack of disinfectant could also be included.

Workload and Systemic Pressure: When there is a large influx of patients, healthcare practitioners can only do so much, and administrative work mounts, healthcare practitioners rely on mental shortcuts. Infection control procedures can seem like obstacles rather than necessary adjuncts to quality care, particularly in emergency and dental settings.

Cultural & Behavioral Underpinnings: Attitudes like "I've never been infected," invulnerability, and inconsistent role-modeling by senior members within the clinical community contribute to a culture where shortcuts are not eliminated. The Onward & Upward mentality to mistakes prevents learning from close calls.

4.2 The Imperative for Multidisciplinary Integration:

From Silos to Ecosystem Evidence indicates that having exceptional infection prevention in one silo is not sufficient. "A hospital can have exemplary nursing infection prevention practice but, if the dental department does not sterilize infection, or the lab improperly handle a TB specimen, or the pharmacy improperly compound a contaminated drug, the entire protective mechanism will fail." Almutairi et al. provide an excellent insight into the reality of the situation: "Infection prevention must be a totally integrated biological system. Each department must be like a critical organ in the hospital." In this respect, each department becomes a crucial component for the hospital. Dentistry manages the entrance point for the oral/aerosol route; Nursing manages the bed/wound route; the Laboratory manages disease identification and containment; the Pharmacy manages therapeutic and preventive strategies; Radiology manages diagnostic routes; and the Information Department manages the capacity to input immediate information from various platforms. If there are some vulnerabilities, say communication breakdowns, in the dentistry, lab, or pharmacy departments, this will allow the entire biological system to fall apart. THIS IS EXACTLY WHAT IS CURRENTLY HAPPENING, according to these studies.

4.3. Role-Specific Challenges within the Fragmented System

- **Nurses:** Nurses may find themselves at the end of the line with policies they do not have the influence to affect because they have not contributed to them, with minimal ability to solve an underlying problem that undermines them, such as staffing patterns or weak logistics.
- Dental healthcare professionals operate within a risk environment that is grossly misconstrued. The profession holds on to traditional views of bloodborne pathogens, but the more sinister aspect of aerosols has been grossly underestimated. Thus, aerosol-based respiratory and eye protection and air quality have been grossly overlooked, as during the COVID-19 pandemic.

- In radiology, another challenge is encountered. It is related to logistics or comfort. They have to clean and sterilize large, intricate, and delicate equipment on schedules driven by the market for healthcare services, which may not be defined beforehand for materials used in certain imaging devices.
- Both the pharmacy and laboratory services lack a form of invisibility. These errors cannot be traced easily by the patient's bedside but may lead to the slow growth of an outbreak that may be hard to trace. This demands an environment of high internal vigilance and accountability.

4.4. Moving Forward: Turning Evidence into Action

"What the studies are saying"—the divergence of knowledge and practice, the specific gaps in both roles, the insistence on the separation of the silos—clearly diagnoses the problem in health care. The solution is not another generalized policy initiative but rather an orchestrated and planned overhaul. This will include investments in competence-based education specific to the risk profile of each role (e.g., aerosols in dentistry, sterilizations in pharmacy). This will also demand specific, auditable metrics in every department, from "compliance" to actual measurement (e.g., spore plate evaluations, surface bioluminescence). What it all boils down to is using informatics to overcome the silos, utilizing the EHR to identify risks and coordinate care, and having actual multidisciplinary governance, where every major hospital department has a representative on the Infection Control committee. In other words, through having the specific challenges of each of the different professions within one systemic framework, healthcare organizations can move towards building an intelligent, safe, and resilient environment out of the current patchwork of rules of their current infection control program.

5. Evidence-Based Recommendations for a Cohesive IC Program

For institutions that believe in finding a fix fast and elevating their system to a whole new level, the need to move away from generic checklists and typical organization strategies in a particular region is imperative. The truth that the various studies summarized in the books agree with is that a system overhaul is much needed, one that changes the way people think, act, and live.

(1 Infection control skills training needs to be role-specific, task-competency oriented, and done on an on-going basis, rather than included in annual performance appraisals. These programs should feature:

-For the Dental team: aerosol-generating procedure management; proficiency training in donning and doffing full personal protective equipment; respirator fit testing; workshops on sterilization processes using biological and chemical indicators.

-For Radiology technicians: Infection control practices in various imaging modalities; Choosing the right disinfectant for MRI environments; Covering ultrasound probes.

•For Pharmacists and Lab Technicians: simulation based aseptic procedure skills training sessions and annual biosafety certification based on the standards of a microbiology reference lab.

(2 Improve infection control policies using auditable, actionable steps from binders to implementation-ready solutions. Organize policies according to departments and display them as graphics at the point of work with linkage to procedure outcomes. These include:

- Percentage per month of dental handpieces which pass biological spore testing. - ATP bioluminescence values on the high-touch surfaces in the Radiology region post-cleaning activity.

- Results of ongoing sampling from clean rooms in pharmacies regarding the sampling of microorganisms, and the success rate regarding proper sampling packaging from patient rooms to the lab. At staff meetings, share the results. When not meeting expectations, determine the source to see if the method was not successful or if the cleaning time could improve.

3. Engineer a Culture of Psychological and Procedural Safety:

Infection control leadership needs to be a constant guiding light, demonstrating perfect practice daily. Establish a reporting mechanism where mistakes and near misses are recognized as opportunities for learning-nonpunitive and based on just culture-so that we can identify where the process is fragile, not fault the person who happened to fall. Search out and recognize teams or individuals demonstrating exemplary compliance, while reinforcement continues to hardwire the behaviors.

More importantly, leadership should own fixing the root causes that error reports and audits reveal. If nurses report no access to eyewear, accelerate the procurement path. If radiology teams flag unworkably tight turnaround times for proper disinfection, revise the process design. This constitutes a facility-wide commitment to the cause at hand, not simply a staff duty.

4. Utilize Health Informatics for real-time system-wide coordination:

visualize a Medical Information Department transitioning from being the document vault to the Central Nervous System of the Infection Control System. Use EHRs to embed hard-stop alerts. Upon admission or transferring patients who are suspected or confirmed to carry MDROs or active TB, auto-notifications should reach the concerned departments, with isolation precautions being pre-emptively initiated. Real-time dashboards will feed infection control committees and unit managers; track key system-wide metrics in a structured way. This shifts infection management from anecdote to managerial insight, allowing true system-wide control.

5. Ensure Unwavering, Strategic Resource Allocation:

Infection control is not merely another expense to account for. Infection control is the spine of health at our facility. When we influence the course of patients' lives through better outcomes and shorter lengths of stay, we shape the course of our expenses associated with HAI-related reimbursements. We need to keep the piece of land healthy. Here's how our budgeting priorities should remain:

- All forms of personal protective equipment, escalated to the new N95 and beyond.
- Up-to-date and accurate automatic sterilizers that have the capacity for annual use documentation.
- Evidence-based, facility-approved disinfectants and a safe, effective way to sanitize all surfaces, both porous and non-porous.

What is most important, however, is a robust engineering control: isolation rooms with negative pressure and improved ventilating/HEPA filtration systems in dental settings and bronchoscopy suites. There also needs to be an official interdisciplinary Infection Control infrastructure with bite. The Hospital's ICC has to be reorganized so that it has real, vested decision-making powers and a legitimate, intersectionally representative membership. Voting members of the ICC would come from infection control expertise in nursing, dentistry, pharmacology, laboratories, radiology, anesthesiology, or facilities/services. It also needs to meet regularly for discussions of patient incident reports, analysis of infection surveillance data, or audits of infection control practices in every area of the hospital. It aims at creating comprehensive joint hospital policies concerning infection control of admitted patients with pulmonary infections—from admission for transfer into isolation in an inpatient setting. A direct line to key leadership, such as the Chief Medical Officer or Chief Nursing Officer, from the ICC chief can help assure the input of infection control into staff and facility planning.

Conclusion

Infection control is now an intricate task that lives when the voices of the professionals intersect. This is what the review says essentially: Infection control has an underlying body of knowledge that applies across nursing, the Emergency Department, dental services, radiology, pharmacy, and laboratory services. The point is not that but the gap created by the inequity of the knowledge.

A complete paradigm shift is required. "Each hospital infection control program should be treated as a closed socio-technical system." Essentially, the plan is that each professional community can stay separate but is absolutely necessary and inextricably linked in this way. "The safety of every patient depends on the well-integrated functioning of these various 'parts.' There should be an absolute focus on the development of infection control-related training and evidence-based policies; even more important is the promotion of the infection control culture as the 'bedrock' of the organization." The literature is akin to "beating the message into the head of the leadership." It is up to the literature's intended audience of the leaders of the healthcare industry to make this happen.

References

1. AlAnazy, J. A., & Ahmed, W. A. E. (2024). Infection prevention and control in the emergency department unit in King Khalid Hospital, Hail City, Saudi Arabia. *Evidence-Based Nursing Research, 6*(3), 11–19.

2. Almutairi, H. A. S., Alzahrani, A. A. G., Al Sillah, H. N., Al-Harbi, A. K., Alotaibi, A. G. H., Alharthi, A. O. M., Alqarni, I. H., Alsaiani, S. A. M., Suhail, I. O. M., Alzahrani, S. M. S., Al Mushawi, A. A. S., Ahoweser, A. A., Alothman, A. I., Alharbi, N. F., & Al-Harbi, J. A. (2025). Infection control protocols for patient safety: Collaboration of dentist, medical nurse, medical doctor, radiology, laboratory, nutrition, anesthesia, pharmacy, and medical information department. *The Review of Diabetic Studies*, 21(S7), 243–278.
3. Butt, F., Thakkar, H., Munguti, J., & Waigayu, E. (2019). Infection control measures among dental health care workers. *Annals of African Surgery*, 16(1), 26–29.
4. Centers for Disease Control and Prevention. (2003). Guidelines for infection control in dental health-care settings—2003. *MMWR Recommendations and Reports*, 52(RR-17), 1–66.
5. Fawzi, S. E., Sleem, W. F., Shahien, E. S., & Mohamed, H. A. (2019). Assessment of knowledge and practice regarding infection control measures among staff nurses. *Port Said Scientific Journal of Nursing*, 6(1), 83-100.
6. Gezie, H., Lata, Eds, Admasu, F., Gedamu, S., Dires, A., & Goshiye, D. (2019). Health care workers knowledge, attitude and practice towards hospital acquired infection prevention at Dessie referral hospital, Northeast Ethiopia. *Clinical Journal of Nursing Care Practice*, 3, 059-063.
7. Halboub, E., Al-Maweri, S. A., Al-Jamaei, A., Tarakji, B., & Al-Soneidar, W. A. (2015). Knowledge, attitudes, and practice of infection control among dental students at Sana'a University, Yemen. *Journal of International Oral Health*, 7(5), 15-19.
8. Javaid, M., Sahu, E., Malik, A., Khan, N., Noor, A., & Shaukat, M. S. (2020). Practice of personal protective equipment among dental surgery assistants: survey from a public sector hospital. *Journal of the Dow University of Health Sciences*, 14(1), 3-7.
9. Mahasneh, A. M., Alakhras, M., Khabour, O. F., Al-Sa'di, A. G., & Al-Mousa, D. S. (2020). Practices of infection control among dental care providers: A Cross Sectional Study. *Clinical, Cosmetic and Investigational Dentistry*, 12, 225-232.
10. McCarthy, G. M., Koval, J. J., & MacDonald, J. K. (1999). Occupational injuries and exposures among Canadian dentists: The results of a national survey. *Infection Control & Hospital Epidemiology*, 20(5), 331-336.
11. Nagliate, P. C., Nogueira, P. C., De Godoy, S., & Mendes, I. A. C. (2013). Measures of knowledge about standard precautions: A literature review in nursing. *Nurse Education in Practice*, 13(4), 244-249.
12. Sahiledengle, B., Gebresilassie, A., Getahun, T., & Hiko, D. (2018). Infection prevention practices and associated factors among healthcare workers in governmental healthcare facilities in Addis Ababa. *Ethiopian Journal of Health Sciences*, 28(2), 177-186.
13. Soliman, A. A., Abd El-Aziz, M. S., & Elsayed, D. M. S. (2022). Infection control measures among nurses at dental clinics. *Journal of Nursing Science – Benha University*, 3(2), 637–651.
14. Teymourzadeh, E., Bahadori, M., Fattahi, H., Khodadost, M., & Shokri, A. (2019). Nurses' competency and their role in prevention and control of hospital infections: A case study in a large military teaching hospital. *Advances in Human Biology*, 9(2), 156-161.
15. World Health Organization. (2021). *Infection prevention and control during health care when coronavirus disease (COVID-19) is suspected or confirmed: Interim guidance*. WHO.