

The Role of Health Administration in Reducing Blood Culture Contamination: An Applied Study at King Abdullah Bin Abdulaziz University Hospital, Riyadh

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Abstract

Blood culture contamination poses significant clinical and economic challenges by leading to inaccurate diagnoses, unnecessary antibiotic use, and increased healthcare costs. This study aimed to assess the effectiveness of administrative practices in reducing blood culture contamination at King Abdullah bin Abdulaziz University Hospital (KAAUH) in Riyadh. A descriptive quantitative design was adopted, and data were collected from 110 healthcare professionals, including physicians, nurses, laboratory technicians, and health administrators.

The results indicated a high level of agreement regarding the clarity and regular updating of administrative policies, the availability of continuous training programs, and the provision of adequate sterile equipment and protective resources. Findings also revealed strong monitoring and evaluation mechanisms, including regular tracking of contamination rates, existence of specialized committees, and feedback communication with staff. Overall, the study concludes that administrative practices at KAAUH are well-structured and significantly contribute to reducing

contamination levels. The study recommends expanding simulation-based training, enhancing policy dissemination, and developing digital dashboards for continuous quality improvement.

Introduction

Bloodstream infections (BSIs) and sepsis are major global health threats. Accurate diagnosis via blood culture is critical but compromised by blood culture contamination (BCC)—the introduction of skin or environmental microbes during sample collection. BCC leads to false positives, unnecessary antibiotic use, prolonged hospitalization, increased costs, and patient harm.

While clinical standards set a BCC target below 3% (ideally $\leq 1\%$), real-world rates often exceed this, sometimes reaching 12%. Proven sterile collection techniques (e.g., chlorhexidine skin prep, sterile kits) can reduce rates to $\leq 1\%$. However, sustained improvement requires strong **health administration**: leadership, policy implementation, resource allocation, staff training, and quality monitoring.

International studies confirm that administrative actions—like standardized protocols, audit feedback, dedicated equipment, and interdisciplinary teams—are key to reducing BCC. In Saudi Arabia, studies show both high contamination rates and successful reductions achieved through administrative leadership.

Despite evidence, large Saudi academic hospitals like King Abdullah Bin Abdulaziz University Hospital (KAAUH) lack systematic data and structured administrative strategies to tackle BCC. This study will examine how administrative structures can transform blood culture collection into a reliable, quality-driven process.

Problem Statement:

Accurate blood culture is essential for managing BSIs, but BCC causes false-positive results, triggering unnecessary treatments and costs while worsening antimicrobial resistance.

Although the benchmark BCC rate is <3%, many hospitals exceed it. A Saudi study reported a 6.6% rate, with peaks of 10.3%, linking high rates to procedural gaps and administrative challenges during staff shortages.

Globally, successful BCC reduction relies on systemic administrative support: leadership, standardized protocols, training, and monitoring. Studies show interdisciplinary efforts backed by administration can cut BCC rates significantly (e.g., by 45%).

In Saudi Arabia, tertiary hospitals like KAAUH recognize the need to integrate administrative practices with clinical outcomes to address BCC. However, context-specific data and tested administrative frameworks are lacking for large academic settings, despite evidence that administrative-led protocols can succeed in other Saudi hospitals.

Study Importance:

Scientific Importance:

Blood culture contamination (BCC) undermines diagnostic accuracy, epidemiological tracking, and antimicrobial resistance monitoring. While procedural solutions exist, their sustainability depends on administrative systems—like policy, funding, training, and oversight—which are under-researched. This study addresses that gap by investigating the **administrative determinants** of BCC reduction at KAAUH, providing a framework to analyze how governance and resources shape outcomes.

It extends diagnostic stewardship and quality improvement concepts by testing global evidence (e.g., the role of feedback and standardization) within a specific Saudi academic hospital context. This contextual inquiry is vital, as organizational culture and resources vary, affecting how interventions translate.

Practical Importance:

This research offers direct value by enhancing **patient safety** and **resource efficiency**. Reducing BCC leads to more accurate diagnoses, curbs unnecessary antibiotic use, shortens hospital stays, and lowers risks like *C. difficile* infection and antimicrobial resistance.

Economically, BCC imposes significant hidden costs. Lowering contamination rates can yield substantial savings by avoiding unnecessary tests, medications, and extended hospitalization.

Operationally, reducing BCC streamlines workflow, decreasing follow-up tests and laboratory burden. The study's findings will empower leaders to optimize procurement, training, and processes using tools like dashboards and standardized kits.

Finally, the study aligns with **national and global antimicrobial stewardship** priorities. Integrating BCC metrics into quality monitoring helps combat inappropriate antibiotic use, supporting broader efforts to curb resistance.

Study Objectives:

1. Determine baseline blood culture contamination rates at King Abdullah Bin Abdulaziz University Hospital (KAAUH), stratified by department (e.g., ICU, ED, wards), collector role (phlebotomist vs. nurse), and seasonal variation.
2. Take a look at current administrative systems such as the governance system, training programs, methods of procurement, and feedback to learn how they impact the behavior of contamination prevention.
3. Develop and introduce an intervention that is led by the administration, weekly updating with contamination dashboards, and uniformly dispensed sterile-kits, and specific retraining sessions, to facilitate stable protocol adherence.
4. The effectiveness of the intervention on the contamination rates should be evaluated by comparing the pre and post intervention data and the ultimate goal is to bring the contamination rates below the CLSI cutoff limit of 3 percent and preferably to one percent.

5. List the facilitators and constraints of the health administration setting, to create knowledge to support the use of sustainable quality improvements and to achieve their replication in other Saudi tertiary hospitals.

Study Questions:

Main Research Question

- To what extent can health administration–led interventions reduce blood culture contamination rates at King Abdullah Bin Abdulaziz University Hospital (KAAUH), and what administrative mechanisms (governance, resources, training, feedback) are most effective in achieving this reduction?

Sub-Questions

What are the current blood culture contamination rates at KAAUH, stratified by department (e.g., ICU, ED, wards), collector type (phlebotomist vs. nurse), and seasonal factors?

Which are the current structures, procedures, training and allocation of resources at KAAUH to help improve the quality of blood culture collection?

How does the introduction of an administrative-led intervention (weekly contamination dashboards, standardized sterile kits, retraining) influence compliance with bestpractice blood culture protocols?

How will the intervention affect the rates of blood cultures contamination, patterns of antibiotic use, and its related healthcare expenses relative to pre-intervention standards?

Study Hypothesis

Main Hypothesis (H_0):

Health administration–led interventions (e.g., weekly feedback dashboards, standardized sterile kits, and retraining programs) will significantly reduce blood culture contamination

(BCC) rates at King Abdullah Bin Abdulaziz University Hospital (KAAUH), bringing them below the CLSI benchmark of 3%, ideally trending toward 1%.

Sub-Hypotheses

1. Blood culture contamination rates at KAAUH vary significantly by unit (ED, ICU, wards), collector type (phlebotomist vs. nurse), and season—indicating critical areas for targeted administrative intervention.
2. The unadjusted BCC rates will be lower in those departments that have an effective existing administrative support structure in place in terms of formal governance, equipment budget, and feedback mechanisms that are a routine.
3. Following the implementation of administrative-led interventions, departments at KAAUH will experience a statistically significant reduction in BCC rates compared to baseline ($p < .05$).
4. At the end of the reductions in BCCs, it will be possible to record quantifiable changes in excess antibiotic expenditure as well as a laboratory expenditure that will support the veracity of the economic and stewardship worth of the administrative spending.

Previous Studies

1. Hosni et al. (2024)

Hosni et al. (2024) conducted a focused intervention study at King Abdullah Hospital in Bisha, Saudi Arabia, implementing structured administrative strategies to reduce blood culture contamination (BCC). Intervention involved training of staff, standardizing of collection kits, improved governance reviews and interdisciplinary review meetings. They managed to reduce the rate of contamination by as much as 2.1 percent to about 5.2 percent in six months. The impact of the alignment of administration to clinical protocols was also shown by the sustainable improvement in performance of the hospital, conditioned by integration of contamination metrics in key performance indicators in the departments.

In addition to quantitative gains, the research emphasized the need of administrative support and resource commitments. Athena staff survey reflected the increased level of according awareness, an obvious system of accountability, and the management promotion

as the most important factors of the intervention success. The results present a strong framework of how the secondary hospitals such as KAAUH can possibly replicate the low-cost management programs to improve the precision of diagnosis and safety of patients. The authors indicate the importance of regular monitoring and continuous re-training to sustain gain, presenting the process of BCC reduction as a quality improvement process.

2. He et al. (2019)

He et al. (2019) examined the effects of weekly contamination reports and feedback in an intensive care unit (ICU) setting. The intervention created a feedback circle, with weekly dashboards on contamination events, the performance of collectors, and trends at the departmental level given to the ICU personnel accompanied by administrative leadership meetings. Already after three months, the levels of contamination decreased to 2.7%; the positive results continued up to six months after the intervention.

The authors stated that the important considerations were the leadership endorsement, frequent data examination, and open performance correspondence. This organizational feedback influenced responsibility and made corrective training possible. In its conclusions, the study highlights the possibility of drastic changes in clinical quality outcomes after small, consistent investments at the administrative level and discusses the recommended systematic approach to data management and reporting as one of its key potential areas.

3. Hemeg et al. (2020)

In a one-year cross-sectional study at a tertiary Saudi hospital, Hemeg et al. (2020) analyzed contamination rates across units, including seasonal variations and collector roles. They recorded aggregate BCC rate of 6.6 with a maximum of 10.3 in the medical wards and when the hospitals were having high number of patients. The procedure of audits and interviews with staff members by the study found that inefficient training, discrepancy between aseptic techniques, and lack of administration control provided most of the contamination.

The value of the study consists in the fact that temporal and structural risk factors have been identified. Hemeg et al. strongly characterized the importance of long-term administrative surveillance and contingent resource allocation by pinpointing times of high contamination with employee shortages and workload demands. Their results act as an important basis of diagnosis signifying that administrative response to operation variability requires a structure.

4. Rupp et al. (2017)

Rupp et al. (2017) conducted a randomized controlled trial evaluating the impact of initial specimen diversion devices (ISDDs) compared to standard sampling methods. With ISDD utilization there was a 50 per cent reduction in contamination-3.5 to 1.7 per cent- without the loss of diagnostic yield. The research highlighted that the possibility of incorporating ISDDs into regular practice at reasonable cost is achievable with assistance of resource planning on the part of the administration.

The trial of this nature demonstrates that even an administrative decision, e.g. using new technologies, can have real clinical effects. Asset-based decision-making, procurement, and protocol training enabled successful implementation. Their companion strategies, according to Rupp et al., include continual competency verification and outcome monitoring to achieve a lasting contamination reduction and remind that the adoption of the device must be supported by administrative processes.

5. Hall & Lyman (2006)

Hall and Lyman's (2006) comprehensive literature review systematically assessed blood culture contamination studies, offering procedural, educational, and contextual classification of causes and solutions. They stated that standardization of skin antisepsis, proper staff education, and planned phlebotomy operations were critical in pushing the rate of contamination to less than 3 percent. Notably, they noted that those interventions that

did not have administrative backing in governance and monitoring tended to fail after a few weeks.

The review focuses on institutional accountability and prioritizing of resources as the key to procedural change. It cites incidences of system weaknesses that manifest more regularly, like organization turnover and lack of reinforcement of standards, as causes why most longterm interventions fail. The two authors suggest incorporating the measurements of contamination rates into the organizational quality concepts, an innovation that has become a source of direct guidance in conducting the presented study at KAAUH.

6. Eisenberg et al. (2024)

Eisenberg et al. (2024) studied structured interdisciplinary teams in a large healthcare network. With the suggested interventions of weekly meetings, sterile kits costed-in, and leader-demonstrated performance dashboards, they have reported a 45 percent cut-down in the rate of contamination, which was 3.76 percent in the initial stage and 2.07 percent in the second. Notably, the decline in contamination was not traced to any one intervention strategy but was seen as result of the integrated strategy of governance as well as chain of accountability.

Their contribution highlights the importance of administration as the focal point of clinical best practice integration and upkeep. Such strategies as cross-departmental communication, latticed reporting, and resource allocation were found to be essential towards the achievement of long-term adherence to processes. The research presents convincing indications that the curtailment of enduring contamination enhancements is dependent on administrative ecosystem, and not limited to clinical interventions.

7. Halstead et al. (2020)

Halstead et al. (2020) evaluated contamination reduction programs across four U.S. hospitals, each adopting a variant of administrative-led intervention, including standardized collection kits, staff orientation, and performance feedback. Majority of

hospitals reduced their contamination by at least 40 percent with baselines of 3.2-4.7% to 1.8-2.5 percent. The strength of success was associated with the existence of administrative champions ensuring the coordination across the functions and frequent reporting.

Their multi-site study confirms what they had described in their previous study that administrative leadership is the distinction between short-term improvements and long-term control of contamination. Halstead et al. cite the conclusion that integrating contamination prevention artifacts in administration form, including budget procedures, training planning, executive review enterprises, is fundamental in the sustainability of results and applicability.

Literature Review

1. Donabedian's Structure–Process–Outcome Model

The foundation of this study rests on Avedis Donabedian's Structure–Process–Outcome model, a widely accepted framework for evaluating healthcare quality (Donabedian, 1966/2003; AHRQ, 2024). The component of structure of provision is the situation in the organization where care is provided including the systems of management, the schemes of resources distribution, and training of personnel institutions. That, in this case, refers to such administrative systems of KAAUH as the procurement policies of sterile kits, implementation of training modules, and the creation of interdisciplinary quality committees. The component of process is concerned with clinical activity, such as the use of standard methods of collecting blood cultures, implementing the use of specimen diversion devices, and regular monitoring/reporting. The program component on the outcome side includes measurement of patient relevant measures, which include rate of contamination, use of antibiotics, diagnostic sensitivity and cost implication. Donabedian posits that strong structural capacities foster better processes, which in turn yield superior health outcomes—laying a clear conceptual roadmap for evaluating how administrative elements influence contamination outcomes (AHRQ, 2024; Wikipedia, 2024; Donabedian, 2003).

2. Diagnostic Stewardship Framework

Complementing Donabedian's framework is the concept of diagnostic stewardship, which aims to optimize diagnostic accuracy and patient outcomes by aligning test ordering and collection practices with evidence-based processes (CDC, 2022; MDPI, 2023). Diagnostic stewardship as an aspect of BCC reduction is implemented through administrative leadership towards defining testing indications, normalization of collection procedures, and provision of feedback in real-time. Interventions such as weekly contamination reports (He et al., 2019), departmental scorecards (Zimmerman et al., 2018), specimen diversion devices (Rupp et al., 2017), and nurse-led multimodal bundles (Filipe et al., 2024) highlight how administrative structures can engender appropriate behavior change among clinical teams. Therefore, health administration is considered part of the ability to direct diagnostic stewardship by strengthened accountability and organized procedures.

3. Clinical Governance and Interdisciplinary Teams

The success of contamination reduction initiatives also aligns with clinical governance theories that emphasize interdisciplinary collaboration, responsibility, and quality accountability (Eisenberg et al., 2024; Halstead et al., 2020). Specifically, contamination rate improvements observed in King Abdullah Hospital, Bisha, were attributed to structured administrative oversight of cohesive teams involving nursing, lab staff, phlebotomists, and physicians (Hosni et al., 2024). In the context of KAAUH, the framework implies that the presence of administrative leadership and multi-departmental efforts will be required to maintain lower contamination rates. Incorporating these teams within the governance committees, establishing performance targets and making review meetings possible formalizes the accountability frameworks behind enduring quality improvement.

4. Learning Health System and Continuous Feedback

This study also draws on the concept of a learning health system, which relies on the continuous collection and analysis of process and outcome data to refine practice iteratively (He et al., 2019; Eisenberg et al., 2024). Key elements include contamination dashboards, process audits, and formalized feedback loops that have been put in place to make sure that

the information is translated into action and that organization relies on a continuous improvement culture.

5. Complexity and System Thinking

Finally, contamination processes in healthcare represent complex adaptive systems, influenced by numerous interrelated variables including seasonality, staffing levels, patient acuity, and leadership focus (Hemeg et al., 2020; Donabedian, 1966/2003). Such variables interact dynamically, and it will be necessary to use the concept of systems thinking in designing analytical and intervention plans. In this regard, the research will follow the mixedmode design that will include quantitative variables and the qualitative staff perceptions to ensure the comprehensive understanding of the impact administrative conditions in the real settings have on the results of blood culture collection.

Integration of Theoretical Concepts

Together, these theories form an integrated theoretical framework whereby: (a) administrative structures enable processes that directly affect clinical outcomes, (b) diagnostic stewardship principles guide the operational specifics of contamination control, (c) clinical governance provides accountability and interdisciplinary oversight, (d) learning health system principles ensure adaptability and responsiveness, and (e) systems thinking elucidates interacting variables to guide a comprehensive evaluation. Therefore, the framework will be an appropriate model to follow in designing, and also interpreting the proposed study as it anchors empirical evaluation in the already existing body of knowledge on healthcare quality and management.

Research Design

This study adopts a retrospective, quantitative design employing the analysis of Key Performance Indicator (KPI) data related to blood culture contamination (BCC) at King Abdullah Bin Abdulaziz University Hospital (KAAUH). The main goal will be to assess the improvement role of health administration in BCC reduction by comparing real life rates of contamination, measures connected

with the latter as well as timeframes of given administrations. Drawing on established methodology in healthcare process evaluation, this approach ensures systematic collection and analysis of objective data aligned with the study's objectives.

Population and Data Sources

The study's population for data extraction will be all blood culture specimens collected and processed at KAAUH within the defined study timeframe.

The primary data sources for this study will be:

Hospital Records of Blood Culture Contamination Rates (KPIs):

This will comprise real data obtained on the regular basis regarding the incidences of the contaminated blood cultures in relation to the sum of blood cultures collected inside KAAUH.

This objective data will be used as the main outcome measure.

Associated Clinical and Administrative KPIs:

Additional relevant KPIs, such as antibiotic utilization (e.g., defined daily doses related to contamination episodes) and associated laboratory costs, will also be collected for comprehensive analysis. Furthermore, records of implemented administrative interventions, policy changes, or training programs related to blood culture collection within the study period will be sought from relevant hospital departments (e.g., Infection Control, Quality Assurance, Laboratory Management, Nursing Administration). Such data sources will allow the direct correlation of certain administrative actions or time horizons with quantifiable clinical results.

Study Instruments

Blood Culture Contamination Rate Data:

This will be extracted from the hospital's laboratory information system (LIS) and/or infection control databases. The specific definition of contamination used by KAAUH will be rigorously adhered to (e.g., growth of common skin flora in one of multiple bottles, without clinical suspicion of infection).

Administrative Intervention Records:

Documentation of specific administrative changes, training initiatives, or policy implementations will be obtained from relevant departmental records to define "pre" and "post" intervention periods for analysis.

Statistical Methods

Descriptive Analysis

Initial analysis will involve basic statistics (means, standard deviations, frequencies, percentages) to profile blood culture contamination rates, total cultures collected, average antibiotic utilization, and associated laboratory costs over the study period. Described data will be disaggregated to the department and month levels to detect the trends and baseline characteristics.

Delimitations of the Study

Institutional Scope:

In this work, the departments in which blood cultures were taken in KAAUH will be analyzed i.e., Emergency Department; Intensive Care Unit; general wards; phlebotomy services and microbiology laboratory. It does not count down other hospitals nor the outpatient clinic statistics.

Time Frame:

This factor predetermines the day of collection and analysis within a period of six months i.e. three months before intervention and three months after intervention. This paper does not include the analysis of long-term trends beyond this time range.

Unit of Analysis:

The primary unit of analysis will be departmental-level and overall hospital-level blood culture contamination rates (KPIs), along with associated aggregate clinical and financial metrics. Individual

patient-level outcomes beyond contamination status will not be analyzed (e.g., morbidity or mortality related to contamination).

Geographic and Cultural Context:

The findings are unique to KAAUH in Riyadh, Saudi Arabia, and they are based on the organizational structure of hospitals and the policies of personnel and operations of hospitals. The results cannot be directly used in a context where the system is different or the culture is different without putting it in context.

Data Analysis

Section One: Demographic Characteristics of Participants

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	48	43.6%
	Female	62	56.4%
Age	Under 30	42	38.2%
	30–39 years	40	36.4%
	40–49 years	21	19.1%
	50 or above	7	6.3%
Job Title	Physician	20	18.2%
	Nurse	42	38.2%
	Laboratory Technician	25	22.7%

Variable	Category	Frequency (n)	Percentage (%)
	Health Administrator	23	20.9%
Years of Experience	Less than 2 years	26	23.6%
	2–5 years	39	35.5%
	6–10 years	31	28.2%
	More than 10 years	14	12.7%

The demographic data show that **female respondents represented the majority**, which reflects the typical workforce distribution in Saudi Arabian tertiary hospitals where nursing and laboratory staff include a high proportion of women.

Regarding age distribution, **most participants were under 40**, indicating that the hospital workforce is relatively young and likely to be adaptable to new administrative-led interventions and continuous training programs.

In terms of job roles, **nurses formed the largest group**, followed by laboratory technicians and health administrators. This is significant because these categories are directly involved in blood culture collection and contamination-prevention protocols, thereby providing reliable insights into operational policies and challenges.

As for experience, the distribution suggests a balanced mix of junior and mid-career employees. This diversity enhances the validity of the findings since both recently trained staff and highly experienced personnel contributed perspectives regarding administrative procedures, training, resources, and monitoring practices.

Section Two: Study Dimensions

Dimension 1: Administrative Policies and Procedures

Item	SA	A	N	D	SD
Clear written policies exist	72 (65.5%)	36 (32.7%)	2 (1.8%)	0	0
Policies are regularly updated	56 (50.9%)	46 (41.8%)	7 (6.4%)	1 (0.9%)	0
Staff compliance is monitored	52 (47.3%)	53 (48.2%)	4 (3.6%)	1 (0.9%)	0
Guidelines on proper collection are available	54 (49.1%)	52 (47.3%)	2 (1.8%)	2 (1.8%)	0

The results indicate a **very high level of agreement** across all items, showing that the hospital maintains clear written blood culture collection policies, regularly updates them, and ensures availability of procedural guidelines. Almost all respondents acknowledged active monitoring of staff compliance.

These findings suggest that **policy structure at KAAUH is strong**, forming an essential foundation for contamination reduction initiatives. However, the small proportion of neutral responses may indicate a need for further policy awareness sessions to ensure consistent understanding among all staff categories.

Dimension 2: Training and On-the-Job Development

Item	SA	A	N	D	SD
Staff receive regular training	52 (47.3%)	52 (47.3%)	5 (4.5%)	1 (0.9%)	0
Performance is evaluated after training	50 (45.5%)	56 (50.9%)	4 (3.6%)	0	0
Special training programs exist	60 (54.5%)	44 (40%)	5 (4.5%)	1 (0.9%)	0
New staff are trained before duty	66 (60%)	44 (40%)	0	0	0

The findings show **exceptionally strong agreement** on the availability and effectiveness of training programs. Respondents acknowledged the existence of specialized training specific to blood culture contamination prevention.

Particularly notable is the **100% agreement** regarding training of new staff prior to assuming duties, reflecting strong administrative commitment to competency-based onboarding.

These results support the notion that **training is a pivotal administrative mechanism at KAAUH**, playing a key role in maintaining protocol adherence and improving sample collection quality.

Dimension 3: Resources and Equipment

Item	SA	A	N	D	SD
Availability of sterile tools	82 (74.5%)	28 (25.5%)	0	0	0
PPE is adequately available	77 (70%)	33 (30%)	0	0	0
Tools/techniques exist to prevent contamination	66 (60%)	43 (39.1%)	1 (0.9%)	0	0
Adequate budget for infection control	48 (43.6%)	57 (51.8%)	5 (4.5%)	0	0

The responses reveal **near-unanimous satisfaction** with the adequacy of equipment and protective tools. The availability of sterile kits and prevention devices aligns with best practices recommended by CLSI and CDC.

Budget allocation also received strong approval, indicating that the administrative leadership invests sufficiently in infection-control resources. This dimension reinforces the idea that **resource readiness at KAAUH is strong**, providing a favorable environment for successful administrative-led interventions.

Dimension 4: Monitoring and Evaluation

Item	SA	A	N	D	SD
Contamination rates are monitored regularly	76 (69.1%)	33 (30%)	1 (0.9%)	0	0
Causes of contamination are analyzed	69 (62.7%)	40 (36.4%)	0	1 (0.9%)	0
Committees/teams exist for monitoring contamination	66 (60%)	42 (38.2%)	1 (0.9%)	1 (0.9%)	0
Staff are informed of performance results	77 (70%)	31 (28.2%)	1 (0.9%)	1 (0.9%)	0

Monitoring and evaluation practices appear to be **highly institutionalized** at KAAUH. Respondents overwhelmingly affirmed regular tracking of contamination rates, existence of specialized oversight committees, and dissemination of performance findings to staff.

These practices are essential for sustaining quality improvement and align with international recommendations for diagnostic stewardship.

The consistency of agreement suggests that **monitoring systems are functioning effectively**, providing administrators with reliable feedback loops that support reduction of contamination rates.

Discussion of Findings

Administrative Policies and Procedures

The results demonstrated consistently high levels of agreement regarding the existence, clarity, and regular updating of blood culture collection policies. Respondents further confirmed that guidelines are accessible and that compliance is continuously monitored.

These findings highlight that **administrative structure at KAAUH is robust**, aligning with international recommendations from CLSI and CDC, which emphasize policy standardization as a key determinant of contamination reduction.

Training and On-the-Job Development

Training emerged as a central strength within the hospital. Nearly all respondents acknowledged receiving routine training, specialized programs, and structured onboarding for new staff.

The finding that **100% of participants confirmed pre-duty training for new personnel** underscores a strong organizational culture of competency assurance. This aligns with global evidence that continuous training significantly lowers contamination rates and improves adherence to aseptic techniques.

Resources and Equipment

The analysis revealed near-unanimous satisfaction with the availability of sterile equipment, personal protective equipment, and contamination-prevention tools. The majority also agreed that sufficient budget is allocated for infection control.

These results indicate that **resource readiness is not a limiting factor** at KAAUH. Adequate equipment availability supports optimal implementation of administrative policies and enhances compliance with blood culture collection standards.

Monitoring and Evaluation

Findings confirmed that contamination rates are regularly monitored, causes are analyzed, and results are communicated to staff. The existence of specialized committees further strengthens the

hospital's oversight system.

This comprehensive monitoring culture suggests that **feedback loops are well-established**, enabling timely corrective actions and reinforcing best practices.

Recommendations

Administrative Policies

- Increase periodic awareness sessions to ensure that all staff—especially newly assigned members—fully understand the policies.
- Continue strengthening policy dissemination using digital platforms, such as internal portals and mobile alerts.

Training and Workforce Development

- Expand simulation-based training modules focusing on complex collection scenarios.
- Introduce competency re-evaluation every 6 to 12 months to maintain high technical standards.

Resources and Infrastructure

- Maintain continuous assessment of supply-chain management to prevent any shortages in sterile kits or PPE.
- Upgrade equipment when newer contamination-prevention technologies become available.

Monitoring and Evaluation

- Increase staff feedback sessions to promote a culture of transparency and shared responsibility.
- Develop detailed dashboards to track contamination trends and unit-specific performance indicators.

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