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Original Research Article

ROLE OF PERFORMANCE IMPROVEMENT MEASURES TO IMPROVE THE QUALITY OF INFECTION PREVENTION PROGRAMS IN TERTIARY CARE HOSPITAL

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Abstract: *Healthcare-associated infections (HAIs) pose a significant risk in hospital settings. Performance improvement measures can enhance the quality of infection prevention programs, leading to better outcomes for patients.* ***Objective:*** *To assess the impact of performance improvement measures on enhancing the quality of infection prevention programs in a tertiary care hospital.* ***Methods:*** *This quasi-experimental study was conducted with healthcare workers (HCWs), including doctors, nurses, infection prevention officers, and support staff, at a tertiary care hospital. The intervention included comprehensive performance improvement measures: rigorous training, educational initiatives, regular audits with feedback, adherence to standard operating procedures (SOPs), checklists, monitoring tools, and hand hygiene promotion. Quantitative data on infection rates, infection control compliance, hand hygiene adherence, and antibiotic usage were collected at baseline and 3, 6, and 12 months post-intervention. Qualitative data were gathered from semi-structured interviews and focus groups to explore barriers and facilitators to infection prevention.* ***Results:*** *The intervention group showed a significant reduction in HAIs per 1,000 patient days compared to the control group (3.06 ± 1.09 vs. 8.23 ± 5.18; p = 0.00). Compliance with infection control practices (71.0% vs. 61.0%; p = 0.13) and hand hygiene adherence (64.0% vs. 48.0%; p = 0.02) were also higher in the intervention group. However, no statistically significant difference in antibiotic usage was observed between the two groups (59.0% vs. 49.0%; p = 0.1).* ***Conclusion:*** *The study demonstrates that performance improvement measures significantly reduce HAIs and improve compliance with infection control protocols. These targeted strategies are essential for enhancing infection prevention in healthcare settings and improving overall patient safety.*

Keywords: Healthcare-Associated Infections, Hygiene Compliance, Infection Prevention Programs

Introduction

Healthcare-associated infections (HAIs) contribute substantially to illness and death in tertiary care hospitals globally. (1). These infections not only present serious dangers to patient well-being but also result in extended hospitalizations, higher medical expenses, and an additional strain on healthcare resources. Implementing robust infection prevention and control (IPC) programs is crucial for reducing these risks. IPC remains a fundamental approach for preventing both hospital-acquired infections and antimicrobial resistance (2). Hospital-acquired infections are linked to significant morbidity and mortality rates, impacting over 1.4 million patients worldwide each year and with an estimated mortality rate exceeding 10% (3). Low- and middle-income countries (LMICs) bear a disproportionate burden of HAIs, with as many as 25% of hospitalized patients experiencing HAIs, compared to 7% in high-income countries. (4). The World Health Organization (WHO) and the Centers for Disease Control and Prevention (CDC) have created extensive guidelines to help healthcare facilities prevent and manage HAIs. These guidelines focus on key practices such as hand hygiene, the use of personal protective equipment, the sterilization of medical tools, and thorough environmental cleaning (1). Hand hygiene is among the most effective methods for preventing HAIs. However, healthcare workers often have low compliance with hand hygiene practices. Research has highlighted several barriers to compliance, such as limited time, skin irritation from hand hygiene products, and forgetfulness (5). Several research studies have explored how performance improvement initiatives impact infection prevention and control (IPC) outcomes. Stone et al (6). Found that a comprehensive infection control program significantly lowered the incidence of HAIs at a long-term care facility.
However, despite these positive findings, implementing such improvement measures in tertiary care hospitals can be challenging. Factors such as high patient turnover, staffing limitations, and resource constraints often complicate efforts to achieve consistent and effective IPC practices.
To assess the role of performance improvement measures in enhancing the quality of infection prevention programs in a tertiary care hospital.

Methodology

The quasi-experimental study took place at Kulsum International Hospital following approval from the hospital's ethical committee. The study was conducted within the premises of a tertiary care hospital, involving a diverse cohort of healthcare workers (HCWs) comprising

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doctors, nurses, infection prevention officers, and support staff. To enhance infection prevention practices, a comprehensive set of performance improvement measures was implemented. These included rigorous training and educational initiatives focused on infection prevention protocols, regular audits accompanied by feedback mechanisms to monitor and improve compliance with infection control practices, strict adherence to standard operating procedures (SOPs) for infection control, utilization of checklists and advanced monitoring tools, and extensive campaigns promoting hand hygiene, complemented by the provision of hand sanitizers throughout the hospital. Data collection for the study encompassed a dual approach. Quantitative data were systematically gathered, encompassing baseline assessments of infection rates, including healthcare-associated infections (HAIs), alongside evaluations of compliance with infection control measures, rates of hand hygiene adherence, and patterns of antibiotic usage. Follow-up data were meticulously collected at intervals of 3, 6, and 12 months post-intervention to track sustained improvements in these metrics. In parallel, qualitative insights were garnered through semi-structured interviews conducted with HCWs, aimed at delving into their perceptions, experiences, and challenges about infection control practices. Additionally, focus group discussions were employed to explore both barriers and facilitators encountered in the implementation of these measures, providing a nuanced understanding of the contextual factors influencing the effectiveness of infection prevention strategies in the hospital setting. Statistical analysis was performed using SPSS version 25.

Results

Our study presents a comparison of key infection control metrics between an intervention group and a control group. The intervention group, which received targeted measures to enhance infection prevention practices, demonstrated significantly lower rates of healthcare-associated infections (HAIs) per 1,000 patient days compared to the control group (3.06 ± 1.09 vs. 8.23 ± 5.18; p = 0.00). Moreover, the intervention group exhibited higher compliance with infection control practices (71.0% vs. 61.0%; p = 0.13) and hand hygiene compliance (64.0% vs. 48.0%; p = 0.02) than the control group. However, there was no statistically significant difference in antibiotic usage between the two groups (59.0% vs. 49.0%; p = 0.1).

Table 1: Comparison of Intervention and Control Groups on Various Infection Control Metrics

	Intervention group	Control group	p-value
HAIs per 1,000 patient-days	3.06±1.09	8.23±5.18	0.00
Compliance with Infection Control Practices (%)	71(71.0%)	61(61.0%)	0.13
Hand Hygiene Compliance (%)	64(64.0%)	48(48.0%)	0.02
Antibiotic Usage	59(59.0%)	49(49.0%)	0.1

HAIs: Healthcare-Associated Infections

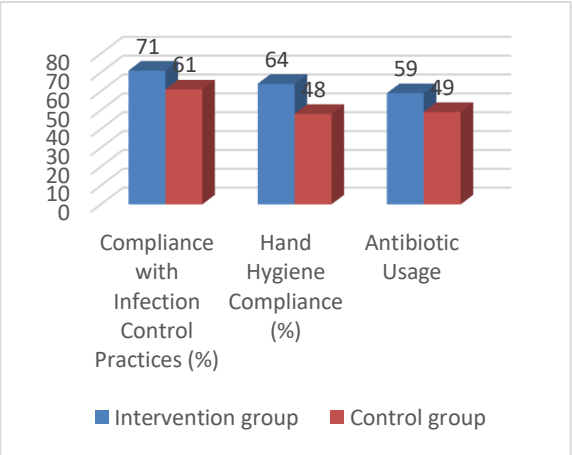

Fig 2: Frequency of various infection control metrics among both groups.

Discussion

Enhancing infection prevention programs in tertiary care hospitals is essential to reduce the dangers of healthcare-associated infections (HAIs) and improve patient safety (7, 8). Performance improvement measures are instrumental in achieving these objectives by systematically identifying and rectifying deficiencies in infection control practices while encouraging compliance with established protocols.

There is a scarcity of research conducted in South Asian countries, such as Bangladesh, utilizing the IPCAF tool to evaluate infection prevention and control (IPC) in tertiary care hospitals (9). This assessment has offered valuable insights into the current status of essential IPC structures, implementation strategies, and operational processes within these healthcare settings. Previous studies have shown that adhering to appropriate IPC measures can potentially reduce the occurrence of healthcare-associated infections (HAIs) by as much as 70% (10). So we are conducting the present study to assess the role of performance improvement measures in enhancing the quality of infection prevention programs in a tertiary care hospital. In our study, comparing the intervention group to the control group provided valuable insights into various infection control metrics. The intervention group, which received focused interventions to enhance infection prevention practices, demonstrated significantly lower rates of healthcare-associated infections (HAIs) per 1,000 patient days compared to the control group (3.06 ± 1.09 vs. 8.23 ± 5.18; p = 0.00). This substantial difference highlights the concrete benefits of implementing systematic improvements in infection control protocols, leading to enhanced patient outcomes and alleviating healthcare burdens.

Furthermore, the intervention group exhibited higher levels of compliance with overall infection control practices (71.0% vs. 61.0%; p = 0.13) and hand hygiene compliance (64.0% vs. 48.0%; p = 0.02) compared to the control group. These findings underscore the pivotal role of educational initiatives, regular audits, and feedback mechanisms in reinforcing adherence to infection prevention guidelines among healthcare staff (11, 12). By fostering a culture of vigilance and accountability, these measures contribute significantly to upholding elevated standards of infection control within healthcare settings. However, our study did

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not find a statistically significant difference in antibiotic usage between the intervention and control groups (59.0% vs. 49.0%; p = 0.1). This suggests that while targeted interventions can effectively impact specific aspects of infection control, strategies focusing on optimizing antibiotic stewardship may necessitate further refinement or alternative approaches to achieve measurable improvements (13). Future research and interventions should continue to explore innovative methods and sustainable practices to bolster overall infection prevention efforts and enhance patient safety across healthcare environments. In Pakistani hospitals, Infection Prevention and Control (IPC) guidelines are generally accessible and widely implemented to safeguard patients, healthcare workers, and visitors from healthcare-associated infections (HAIs) (14). These guidelines are essential components of healthcare delivery, aiming to uphold rigorous standards of infection control and patient safety (15). The availability and implementation of IPC guidelines in Pakistani hospitals demonstrate a dedication to upholding rigorous standards of infection prevention and control (16). Consistently following these guidelines is essential for improving patient outcomes and lowering the occurrence of healthcare-associated infections (HAIs) within healthcare facilities.

Conclusion

It was concluded that the present study findings underscore the effectiveness of the intervention in reducing HAIs and improving adherence to infection control protocols, highlighting the importance of targeted strategies in healthcare settings. Future research should focus on sustaining these improvements and exploring innovative strategies to optimize antibiotic usage while maintaining high standards of infection control to further improve patient outcomes.

Declarations

Data Availability statement
All data generated or analyzed during the study are included in the manuscript.
Ethics approval and consent to participate
Approved by the department concerned. (IRBEC-TCHW-28/23)
Consent for publication
Approved
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Not applicable

Conflict of interest

The authors declared the absence of a conflict of interest.

Author Contribution

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Conception of Study, Development of Research
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SAEED UD DIN (M-Phil Student)
Manuscript revisions, critical input.
MUAZ MUBASHIR (Associate Physician)
Conception of Study, Final approval of manuscript.
MEHDI NAQVI (Physician)
Data entry and Data analysis, drafting article.

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