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Exploring the Knowledge, Attitudes, and Practices of Healthcare Workers about Health Care-Associated Infections in Saudi Arabia

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Abstract

1. Introduction

Health care-associated infections (HAIs) have emerged as a significant and persistent challenge to patient safety and represent a major concern within the broader context of the overall quality of care being delivered. It is of utmost importance for healthcare systems to possess a comprehensive and in-depth understanding of the knowledge, attitudes, and practices that healthcare workers hold regarding infection control, specifically within the context of Saudi Arabia. Such understanding is crucial for effectively and significantly enhancing the existing infection control measures that are currently in place, with the ultimate objective being the improvement of patient health outcomes throughout the entire region. By concentrating our efforts on these critical areas, we can devise and implement targeted strategies that actively promote safer healthcare environments. These strategies not only contribute directly to better patient safety standards but also facilitate an overall increase in the quality of care provided to patients. It is essential to foster a culture of safety and vigilance among healthcare professionals, ensuring that they are well-equipped with the

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necessary knowledge and best practices. This collaboration and commitment to excellence in infection control will ultimately lead to a more resilient healthcare system and better health outcomes for all patients treated in Saudi Arabia's healthcare facilities.

1.1. Background and Rationale

1.1. Background: Healthcare-associated infections (HAIs) have become a critical global concern for patient safety and public health. The World Health Organization (WHO) reports HAIs prevalence in hospitals ranges from 7.6% to 15.5%, varying by country income levels. Interestingly, low- and middle-income countries show significantly higher rates than high-income countries. HAIs not only elevate mortality rates but also increase hospital stays, healthcare costs, and economic burdens on families and communities. Both healthcare workers (HCWs) and patients are susceptible to HAIs, leading to severe complications. WHO estimates indicate millions are affected each year, with tens of thousands dying from substandard healthcare. In high-income nations, nearly one in ten patients face HAIs, whereas the risk escalates in lower-income regions due to inadequate resources and knowledge. The most common HAIs in hospitals are respiratory, bloodstream, urinary tract, and surgical site infections, collectively accounting for half of all HAIs. 1.1.2. Despite advancements in medical science, diseases remain prevalent globally, with HAIs ranking among the top concerns. WHO notes that HAIs show a global prevalence of 5.7% to 19.1%, highlighting the gap between developed and developing countries. Healthcare-associated infections not only negatively impact healthcare quality but also elevate economic costs, emphasizing their public health significance. 1.2. Rationale: The ongoing incidence of HAIs presents substantial challenges for hospitals. Healthcare organizations must navigate various obstacles, with patient retention being key. Patients frequently return to healthcare facilities, which may worsen their conditions, resulting in extended hospital stays. This fosters further deterioration of their health and immunity, often culminating in uncontrolled infections and potential death. While historical perspectives on infection control exist, modern healthcare recognizes the complexity of infections with bio-organisms, prompting the introduction of resources and techniques designed to reduce HAIs. 1. OBJECTIVE OF THE STUDY: Research has consistently delved into the risk factors and determinants linked to nosocomial infections. Statisticians like RA Fisher, Karl Pearson, and Maurice Kendall examined data on these infections in various locations, including Nigeria, Sierra Leone, India, and Saudi Arabia. However, existing data studies falter, as they lack thorough focus on specific diseases, particularly healthcare-associated HIV infection. This investigation aims to analyze how healthcare professionals contribute to the spread of healthcare-associated diseases while providing essential health services, presenting a comprehensive analysis of healthcare-associated HIV infection in South Africa using statistical methodologies to uncover new insights. (Abalkhail et al., 2021)(Abdulaziz Al Ra’awji et al., 2018)

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1.2. Research Aim and Objectives

Since healthcare workers (HCWs) may be directly involved in the diagnosis and treatment of patients with healthcare-associated infections (HAIs), exploring their knowledge, attitudes, and practices concerning these infections is important and valuable. This study aims to assess the knowledge, attitudes, and practice of Saudi Arabian HCWs regarding HAIs in different healthcare settings. The objectives were to understand whether potential barriers to adherence and beliefs about common hospital-acquired infections and their etiology exist. The purpose was also to identify gaps in education and knowledge and describe recommendations for healthcare settings and infection control authorities (Abalkhail et al., 2021).

Regarding HCWs' knowledge and perceptions, the following was noted: approximately 80% of respondents showed a proper understanding of HAIs, but only 63% had done the training regarding HAIs, and 82% believed such training might be beneficial. It is significant to note that a poor understanding that adherence to wound care policies can avoid HAIs; HCWs who have worked between 4 and 7 years may poorly understand the SDU-detected HAI etiology. It is recommended that HCWs with less healthcare experience be given further attention and training to prevent HAIs, which may arise from the detection of a new infectious agent or an unusual site. The need for inadequate washing or laundering techniques was the reason most typically stated for the spread of infections. This demonstrates that HCWs are usually conscious of good practice. However, some HCWs believe in cultural practices surrounding disease causations, such as the supernatural powers that affect infection spread, and such beliefs may lead to poor practices if they divert attention or provide justification for non-compliance to the recommendations (Abdulaziz Al Ra’awji et al., 2018). However, beliefs about beliefs in the policies and practice of the hospital are strongly associated with good practice. By recommending policies that are consistent with this belief, compliance with hospital policy might be improved.

2. Healthcare-Associated Infections (HAIs)

Healthcare-associated infections (HAIs) One of the most frequent offshoots of medical care provision is healthcare-associated infections (HAIs). This broadly term comprises infections that manifest 48 hours or more after hospital aid intake or within a calendar month after a process of healthcare provision. HAIs are associated with overpopulation by microorganisms and their ability to trigger clinical signs, and can be acquired by medical assistance in non-clinical settings. HAIs associated with medical assistance are generally preventable. One example is the surgical site infection, goods of largescale surgeries. A prospective German research concluded that at 17.7 %, wounds were the most hard-hit group in the surgical follow-up period. Patients with these problems importune long-lasting hospital support − three times more than in the absence of a wound infection, and probably derive non-dual transport assistance. In morbially and bacterially injured HAIs patients, about one out of 25

Power System Technology
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infections → the blood flowing, get lethal disease. For 2.7% of the EUR's GDP the European Centre for Disease Prevention and Control (ECDC) determines rising healthcare payments owing to HAIs per annum. In NHS hospitals, every seven out of 100 inpatients have at least one HAI. In view of such facts, in hospitals and non-clinic settings in which patients are assisted by HAIs, it is even more powerful to comply with recommendations and measures to avoid HAIs. In hospitals, mostly care settings, it is imperative to impede the dissemination of health allied diseases when esculous patients are processed. Environmental monitoring is a way to see the pathologist or contribute to the druthers of druther with whoom healthcare-connected RQs want to get the infection, and must be properly applied. Hand hygiene before and after interference with each patient is necessary, one disposition to insult germs on hands and impede contagion. Integrated measures should be applied in addition to the above to drop the chance of HAIs occurence. These take heedous measures are encompassed by, but are not limited to, the wearing of the precise protective barrier, as well bend the rules of cleanliness surrounding (A. Alrebish et al., 2022).

2.1. Definition and Types

As defined by the Saudi Ministry of Health, a Healthcare-Associated Infections (HAIs) refers to an infection acquired by patients seeking healthcare attention in a hospital or a variety of other health care facilities including care clinics (A. Alrebish et al., 2022). In operable terms, this broadly refers to a variety of infections acquired either in a health care setting or during the process of healthcare delivery. Defined more specifically, HAIs are a set of afflictions that are contracted by a patient more than 48 hours post initial hospital admission, or, contrarily, within 30 days of discharge or post any procedures, operations, or handling sessions. In terms of type and categorization, HAIs are deeply inclusive; ranging from superficial skin infections accruing as a result of intravenous needle insertion to more infections that are more local and topical, including those occurring on the skin surface or mucous membrane. This any tissue that surgically opens, varies from a simple skin cut to complex cat surgeries: all are designed to have HAIs in common. Given the plethora, HAIs infections can be broken down into four categories. This first involved is the occurrence of urinary tract infections. Most of these UTIs are caused by Kratom, and they are normally a cozy duration with increasing time in their two inmate conjugation. The society in each case breaks down urinary tract infections to simple-lover tract infections (UTIs can involve junior infection of the tegmentary vascular including the centrifuge, which gave the Glitter hose between urine and blood to those that equalize lower infections), and complex-corner tract infection occurring in the prevalence of cystic emission. There are the infections which come following some surgical operation, known as surgical site infections or SSIs. These HWNDs can terminate leaving the palm surfaces such as hips replacement, and some exterior surgeries. Alternatively, they can disturb profound local tissues, mentioning the tissues in organ spaces arising in organization with the procedure. Lastly, infections which infuse the

Power System Technology
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blood stem are classified under central line-associated bloodstream infections or CLABSI. Herein, the mortality rate is 20 -30% of those who are diagnosed posing a correct resolution, where that attrition sometimes invades Texas and organ bets. Depending on the specific pathogen agent being caused by, CLABSI infections can very rapidly spread, becoming starkly septicemia.

2.2. Prevalence and Impact in Saudi Arabia

Healthcare-associated infections (HAIs) are a common and pressing issue within health care systems. Despite diverse preventive strategies implemented by numerous countries, are still common unfavorable outcomes of health care delivery. Previous epidemiological research findings estimated a prevalence of 3.2 million cases of HAIs per year in the global hospital cohort, with approximately 37,000 deaths directly attributed to these infections (A. Alrebish et al., 2022). In Saudi Arabia, studies examining HAI occurrences and subsequent burdens are limited. In recent decades, a remarkable increase in the number of patients has been observed alongside growth in new healthcare organizations. By monitoring those facilities, a noticeable rise of 72% in the number of HAIs was observed from 2015 to 2020 (from 66 to 113 cases). Paired with this increased frequency, HAIs also drastically extend hospital durations (19 days) while significantly increasing fatalities (3-13 times more likely) in comparison to specifically-admitted non-HAI patients. Furthermore, the price of care for HAI inpatients is more than twice as expensive as non-infected counterparts.

Recent research findings indicate excessive healthcare costs associated with HAIs at $2 up to $11 billion annually, with the rising number of cases only serving to expand the economic burden on the health care system as a whole. In practice, it is this growing figure, patient vulnerabilities, and a range of associated mortality risks that is demanding significant resources to be allocated to care. In hindsight, the development of effective solutions for HAI cases appears to be an issue either, in terms of prevention strategies specially in developed settings, like as a remixing of reusable bedpans and intensive ward cleaning with white vinegar, or a seamless detection system capable of quick alerts in advance of a potential outbreak. Particularly for the Saudi Arabian case, which exhibits consistent growth in the HAI frequency, the position taken on these analytical results should potentially compel further research and wider steps towards HAI determent and increased quality of care throughout the publicly funded healthcare system (Sulaiman Althiyabi et al., 2024).

Power System Technology
ISSN:1000-3673
Received: 16-09-2024 Revised: 05-10-2024 Accepted: 22-11-2024

3. Knowledge of Healthcare Workers on HAIs

3.1. Current Understanding and Awareness

3.2. Training and Education Programs

4. Attitudes of Healthcare Workers towards HAIs

Healthcare workers' (HCWs) beliefs, understandings and actions towards healthcare-associated infections (HAIs) have a significant impact on the success of infection control practices (M. Khatrawi et al., 2023). Personal beliefs, perceptions and past experiences strongly influence compliance with infection prevention practices. A positive attitude towards infection control practices is essential for preventing HAIs (Abalkhail et al., 2021). A recent review suggests that attitudes of HCWs have a significant correlation with practices. Common attitudes include beliefs on the serious nature of HAIs, the perceived responsibility to prevent them, concerns on being blamed for causing them, and the social stigma attached to individuals with infections. Perceptions about the effectiveness and risks associated with compliance can serve as barriers to adherence.

HCWs' attitudes and actions towards HAIs need to be better understood in order to improve compliance with infection prevention and control practices. The organizational factors including perceived safety climate and management support have a significant impact on shaping HCWs' attitudes towards HAIs. An important suggestion from past research is for initiatives to be focused on moulding perceptions, as this will in turn translate into better compliance with standard precautions for preventing HAIs. Support and information from the organization about HAIs are important factors to shape HCWs' attitude towards prevention of HAIs. Similarly, study indicates an emphasis on the key role of supportive work culture and organizational policies and practices to foster positive attitudes towards HAIs.

4.1. Perceptions and Beliefs

Many healthcare workers have personal experiences, beliefs, and perceptions regarding health care–associated infections (HAIs) that can determine their willingness to adhere to best practices. Such personal experiences can significantly alter beliefs about infections and, by extension, compliance with infection control procedures. However, it is not only personal conceptions of issues related to workplace infections that can enhance or impede the culture of comprehensively dealing with and addressing these matters. Among the Saudi healthcare workforce, the institutional culture and beliefs about HAIs within individual institutions can affect compliance with infection control targets. Misconceptions or lack of concern towards an infection can influence healthcare workers to neglect practices or adhere to unsafe ones during daily routines (Abalkhail et al., 2021). Individual beliefs can be influenced by observations or idiosyncratic experiences of infection spread. Some prevalent healthcare

Power System Technology
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beliefs about HAIs will be discussed, along with some testimonials or case studies that were heard during interviews with various healthcare workers. The aim is to uncover the varying levels of concern among different professions in the healthcare sector and to elucidate how some of these worries come into being. The testimonials and anecdotal evidence reveal how peer attitudes and levels of concern within different professions can variably influence personal beliefs. Also, one case study is given that demonstrates how a concern that is communicated between colleagues can influence broader healthcare beliefs about HAIs. It is not only the spread of gossip that was concerning to care staff, but widely circulated belief about the manner in which HAIs can be spread that also needs to be addressed. Given the need to keep patients safe, individual healthcare beliefs are a critical part of the spread and containment of infections within the healthcare environment. Nevertheless, these beliefs can be influenced by ongoing education as misinformation is contested. One particularly fruitful area of research is to explore the beliefs that healthcare workers currently hold. It is concerned with healthcare beliefs regarding personal efficacy against stopping infection amongst the healthcare workforce and how certain misconceptions can lead to infection spreading within the day-to-day care of patients. Nonetheless, in some cases healthcare beliefs about personal efficacy in avoiding infection can be overly optimistic, while in the care staff, they can be made entirely cynical. Given the aim of reducing the rate of HAIs in the care environment, it is necessary to address any concerns that are overly complacent as well as those that are overly defeatist. Healthcare beliefs amongst the same profession can be surprisingly widely diversified, even as essential education is supposed to align their beliefs. Therefore, regardless of professional training, personal prior dispositions can play just as crucial a role in infection beliefs.

4.2. Barriers to Compliance

Effective implementation of infection control practices requires the knowledge, attitudes, and practices of healthcare workers, as well as ongoing supervision and adequate resources. However, compliance by healthcare workers with health-care provision practices is frequently hindered by numerous obstacles, ranging from workload pressures to gaps in knowledge or training. Several studies have highlighted such barriers to compliance, arguing that staff may feel overwhelmed or demotivated by the sheer volume of work to be completed within a given timeframe ((Alhumaid et al., 2021) ; (Abalkhail et al., 2021)). Several psychological factors can also influence the likelihood of healthcare workers adhering to safety procedures, including fear of reprimand or complacency. Another study found that some workers develop false beliefs that safety procedures are ‘costly, complex, and annoying’ but often ‘see greater value in rules when informed of their effects’.

The organization setting can be equally influential in promoting or inhibiting adherence to infection control practices. The experience of health-care workers is that management may

Power System Technology
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tend to prioritize output or efficiency over safety. Earlier studies report evidence of poorly thought-out or contradictory management practices, including a lack of consistent messaging in relation to workplace safety. Moreover, the hierarchical architecture of many medical teams means that lower-ranking members may be reluctant to challenge perceived safety risks created by more senior personnel. Small and medium-sided operators might not provide adequate training plans or resources, despite an awareness of the importance of safety protocols. These themes find further confirmation in the series of practices and accidents detailed in recent case studies, where lack of preparation, miscommunication, and noncompliance by health-care workers were often cited as underlying causes of control failures.

5. Practices of Healthcare Workers in Preventing HAIs

Standard precautions help reduce the risk of infection in healthcare settings harnessing the knowledge and attitudes of healthcare workers (M. Khatrawi et al., 2023). Though healthcare-associated infections (HAIs) are avoidable, they are a leading challenge in healthcare worldwide (Abalkhail et al., 2021). The practices of healthcare workers in preventing HAIs are examined through established safety protocols, as this is one of the key recommendations in international and national guidelines to reduce the risk. Adherence to guidelines is critical to ensure that healthcare workers, patients, and family members follow standard operating procedures. Healthcare workers might forget or skip steps, which can mean the difference between life and death. Knowledge and attitudes do not always translate into clinical practice, and this is an established knowledge translation barrier. Several practices are reported to enhance safe protocols in clinical settings. Usual practices, such as washing and changing clothes daily, sterile the materials before using them, put the patient in a single isolation room, and put the patient with an invasive procedure in isolated and with positive pressure, were found to be statistically significant to reduce the incidence of nosocomial infections. Varied practices exist among healthcare workers in preventing an HAI but there has been a global focus on containment due to emerging infection. Hand hygiene, sterilization, and isolation of infected patients are practices that have been proven effective in reducing the risk of HAI.

There are significant gaps in the practices of healthcare workers to prevent HAIs resulting from systemic and organizational issues related to big shared clinical areas with often family members of more patients who interrupt pharmacists to prepare the medication. In this context lack of training, high workflow, and understaffing are also mentioned as causes. While international and national guidelines and protocols have been drawn up they are not always diligently followed and this requires observation studies and audits so that the compliance with infection control protocols can be monitored and evaluated. Research has shown that the ability to consistently implement recommended safety procedures can be

Power System Technology
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influenced by personal and environmental factors on healthcare professionals. Healthcare workers express gratitude and saying thank you for not having a difficult relative may undermine the implementation of infection control principles. Cleaning medical equipment involves the use of liquid soaps and water, alcohol or medical disinfectant solutions, usually intended to be thrown away. There are different materials used to clean medical supplies which can be cleaned together but are often left behind haphazardly or the wrong material is used.

5.1. Adherence to Infection Control Guidelines

Reported the adherence of HCWs (Health Care Workers) to infection control guidelines are specific to HAIs (Gichuhi et al., 2015). Trends in hand hygiene, the use of PPE (Personal Protection Equipment), and other guidelines that apply to the broad prevention and control of all infections are not discussed, although studies observing their adherence are presented in this section. In this context, the term "infection control guidelines" mainly refers to the specific procedural requirements mandated for the prevention of targeted HAIs. The main focus of the papers were the adherence of HCWs to infection control guidelines in the specific hospital care settings. Cross-sectional study designs prevailed, and research was carried out in hospitals. In the first study presented, a sector-wide infection control assessment was carried out across 2 surgical, 2 medical, 2 paediatric, and 1 maternity health care site in healthcare facilities. The sample for all parts of the infection control assessment involved a total of 48, 2-h-long observations of patient care; 16 of which were in each type of facility (a surgical, medical or paediatric facility), either at patient care or at dressing/sterilisation areas. The sites were randomly chosen from the four districts in the health system, and the sampling of observed HCWs (33 for each round of site assessments; i.e. 6 HCWs in the medical and paediatric facilities, and 8 in the surgical facilities) was conducted as described in the HCW interview section. Counts of numbers of correct, incorrect, and no adherence to protocol observed under each of the 10 assessed areas were maintained. Data analysis involved the calculation of simple frequencies and percentages of correct adherence and incorrect non-adherence to protocol separately for all observed practices within each of the 10 assessment areas. Cochran-Mantel-Haenszel statistics were used to test differences in protocol adherence between hospitals and types of health care site descriptions. In this study, 88 (63%) HCWs knew dressing are practices, and there was no significant association between these and correct adherence. In the conclusion part, one of the reasons of being not an adherence was that the majority of the studied HCWs do not know the hospital infection and its consequences. An RCT in progress aims to assess the impact of WHC training in Saudi Arabian hospitals on improving some HCWs' practices (Abalkhail et al., 2021). Preliminary data of a subset of the trial done in a University Hospital in Qassim is analysed. The majority of the HCWs participate at a very good overall agreement with SICPs (Infection Control Practices), and that SICPs and years of experience remain significant

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predictors. However, a good agreement concerning SICPs has no relationship with the implementation of practices.

5.2. Use of Personal Protective Equipment

Patients in all settings use healthcare facilities to obtain medical attention, treatment, and appropriate intervention for various medical diagnoses. The probability of acquiring infections during medical treatment commonly termed as Healthcare-Associated Infections (HAIs) is a worldwide problem involving a broad spectrum of infections. Understanding of HAIs is crucial due to its impact on morbidity, mortality, and cost for management. This crucial aspect of disease management has been examined in different study settings around the globe (ASHOOR et al., 2022). In addition, there have been numerous efforts and considerable progress on the prevention of HAIs. One of the particular actions aimed at the prevention of HAIs is the important issue of the use of personal protective equipment (PPE) while providing medical or nursing care. Undoubtedly, healthcare units are settings wherein diverse interventions are conducted and the presence of a high risk of acquiring and transmitting infection is directly related. In 2016, the World Health Organization (WHO) emphasized the importance of better understanding of knowledge, attitudes, perceptions, and behaviors, including aspects concerning the commitment of healthcare workers towards giving health services. One of the main components in the strategy regarding the prevention and control of HAIs is the protection of healthcare workers performing work-related activities. The use of PPE, defined as “equipment designed for protecting employees from serious injuries or exposures, and there is a great likelihood for injury or illness occurrence in a particular job,” is another crucial measure for the safety of healthcare workers and the patients they care for. PPE includes various types such as gloves, masks, goggles, gowns, face shields, respirators, aprons, and head covers that are designated for use in healthcare facilities. There are particular regulations on the usage of PPE in medical rules and interventions to ensure an effective and safe application.

6. Conclusion and Recommendations

In conclusion, much in the knowledge, attitudes, and practices has been explored. The study showed that the interrelatedness of knowledge and practice was statistically significant, and the effect of knowledge on compliance was relatively high. There has to be continuing education provided to healthcare workers. Although the distinction between attitudes and practices was not as successful as knowledge, these results contribute to understand the relationships between these three main variables determining healthcare workers’ successful compliance with protection rules and discusses how to increase this compliance through better education (Abdulaziz Al Ra’awji et al., 2018). In order to reduce HAIs, it is recommended to provide further training focusing on the detected lacking points of knowledge. Additionally, to improve work conditions and practices for avoiding spread of the

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HAIs, it is suggested to assign more successful protection rules for healthcare workers and to observe their compliance. Overall, better results are targeted in infection control measures in healthcare centers.

In conclusion, further educational support or additional training programs covering both knowledge and practice should be provided to improve health care workers' awareness to a sufficient degree, thus augmenting infection control methods. There exists a significant relationship between improvement of knowledge and compliance; hence, the contributions pertaining to the enhancement of knowledge will also improve compliance—below 50% at first, and then gradually increasing over time. Reduction of generalized extrinsic and intrinsic rejection is beckoned. The primary stance should be taken against the rise of HIV and HBV. Special training programs should be prepared at irregular intervals for all healthcare workers. Medical schools must begin emphasizing the importance of this issue, providing the necessary training. With congruent progression in training sessions, a significant improvement is anticipated not only in the awareness of health care workers but also in infection control measures themselves.

6.1. Key Findings and Implications

Healthcare-associated infections (HAIs) pose a considerable risk to patients, necessitating ongoing effectiveness of infection control in healthcare settings (Sulaiman Althiyabi et al., 2024). Healthcare workers' compliance with infection control measures depends on their knowledge, attitudes, and adherence to practices with HAIs. This study explores these factors among healthcare workers. In the Saudi Arabian context, the importance of infection control has taken priority as patient safety and healthcare quality are at risk in healthcare settings due to adverse events such as HAIs. However, an ongoing challenge is to ensure the effective implementation of infection control in these settings.

This study aims to fill this knowledge gap by undertaking a descriptive cross-sectional approach to explore and report on healthcare workers' knowledge, attitudes, and practices in relation to the control of HAIs in healthcare settings in Saudi Arabia. It is anticipated that the results will highlight factors that may act as barriers or as motivators to improve compliance with infection control measures in Saudi Arabian healthcare settings, thus increasing the value of contributing to mitigation efforts against HAIs.

By means of this exploration, the study reports on the knowledge, attitudes, and practices among healthcare workers regarding the control of HAIs, offering suggestions for conditions that facilitate or inhibit compliance with infection control practices among healthcare workers. In the long term, the cost implications of HAIs serve as key motivators that affect healthcare workers' compliance with infection control measures. There is scope for the strategic planning of more targeted and effective interventions, with implications at both

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national and international levels. A more comprehensive and deeper understanding of these issues encourages further research and discussion.

6.2. Proposed Strategies for Improvement

In accordance with the findings, several recommendations are made to improve the knowledge, attitudes, and practices of HCWs towards HAIs in Saudi Arabia. The findings suggested that a diverse range of factors affected the KAPs of HCWs regarding HAIs, so it was recommended to create wide ranging tailored IC training programs that tackle every relevant issue. This encompasses HAI knowledge, the practice IC measures, and attitudes towards HAIs and infection control. It is recommended to take a positive attitudes and practices scores or to conduct a KAP level test for IC measures as an initial evaluation of HCWs that would energize future tailored training programs in the same year (Abalkhail et al., 2021). There is a need to provide ongoing contextualized IC training in a variety of formats that are easy to assimilate to maintain appropriate levels of KAPs. Therefore, it is recommended to provide either printed or digital IC training material for each department and role in HCWs with the capacity for periodic refreshments. This includes either monthly short in-service training for IC focal points on each floor, or attendance changes and as brief e-mail reminders with the relevant digital material attached.

To facilitate compliance with IC guidelines, several changes have to be made to working environments (Esfandiari et al., 2018). Therefore, as a first step, it is recommended to conduct a needs assessment through an infection control risk assessment of each clinic, ward, or department relying on the assessment tools provided by the guidelines. After identifying areas of weaknesses, it is essential to develop and implement engineering and administrative controlling strategies in those areas by working with IC committees. Furthermore, anonymous periodic assessments should be conducted to evaluate practiced IC measures, and feedback on the results should be issued through quarterly discrepancy reports. This will assure accountability and continuous quality improvement.

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