Infection Prevention: Literature Review

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22 July 2022

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Health care-associated infections (HCAI) are a typical incident worldwide. One survey found that in the United States alone, about 4% of 11282 patients had an HCAI (Haque et al., 2018). The purpose of this paper is to conduct a literature review on the possible causes of HCAIs, and success of different interventions that aim to decrease the rate of HCAIs. The following articles are quantitative studies that present results, outcomes, and discussions of current literature.

Quantitative Results of a National Intervention to Prevent Hospital-Acquired Catheter-Associated Urinary Tract Infection

The article presents the results of a national intervention intended to prevent catheter-associated urinary tract infection (CAUTI) that researchers carried out between November 2016 and May 2018 (Meddings et al., 2019). The researchers included healthcare facilities such as long-term care, intensive, and non-intensive care wards. The article aims to evaluate the effects of the CAUTI prevention initiative (Meddings et al., 2019).

Key Points

The article presents a quantitative analysis of the Centers for Disease Control prevention's States Targeting Reduction in Infections via Engagement (STRIVE) initiative. The authors used the data from STRIVE participating hospitals (Meddings et al., 2019). The participating entities completed assessment tools such as Infection Control Assessment and Response (ICAR) or the Practice Change Assessment (PCA). The researchers utilized these tools to help hospitals identify their weaknesses and any gaps in their infection prevention efforts.

Meddings et al. (2019) state that the main target of the STRIVE initiative is hospitals that experience a high burden due to *C. Difficile* infections. The STRIVE initiative focused on expanding knowledge and applying infection prevention protocols (Meddings et al., 2019). The authors found no substantive reduction in CAUTI after the STRIVE initiative.

Assumptions

The article assumes that the STRIVE intervention may not have resulted as expected because the hospitals did not receive enough support for the initiative (Meddings et al., 2019). The authors also mentioned internal challenges such as unstable leadership and staff turnover as possible reasons why the STRIVE interventions did not result in improved outcomes. These are reasonable assumptions, given that facility-wide interventions can take a long period to be established appropriately. Nursing staff and healthcare providers are crucial in implementing interventions because they are responsible for giving direct care to patients.

Deficit/Conclusion

The authors conclude that the absence of statistically significant improvement in outcomes does not mean readers should be discouraged. The authors think that the results only shed light on the needs of hospitals to promote infection prevention efforts. The authors also add that 50% of CAUTIs are preventable and that healthcare team members can still do much to improve outcomes (Meddings et al., 2019). The authors raise an excellent point when it comes to improvement in healthcare. Collaboration with other members and hospitals in a local area can share resources and support one another to cover the gaps in infection prevention initiatives. If nurses fail to cooperate with others, healthcare facilities will only suffer and experience a more significant burden.

Nurse Staffing and Healthcare Associated Infection, Unit-level Analysis

Many different factors contribute to the development of HCAIs. Shang et al. (2019) examine nurse staffing and HCAIs. Shang et al. (2019) obtained data from an extensive metropolitan healthcare system and performed a unit-level statistical analysis. The authors concluded that there is a statistically significant association between RN understaffing two days before the onset of infection and the development of HCAIs.

Key Points

The authors used multiple electronic data sources to obtain patient information to analyze in combination with the nurse staffing for specific units and shifts (Shang et al., 2019). The authors used data from a metropolitan hospital system from 2007 to 2012. Shang et al. (2019) included HCAIs such as urinary tract infection (UTI), pneumonia, and bloodstream infection (BSI). The authors used survival analysis, calculated hazard ratios, and estimated a Cox proportional-hazards regression model (Shang et al., 2019). In their final sample, Shang et al. (2019) included 100 264 patients from 34 units. The analysis results show that 4 390 (4.34%) of patients developed HCAIs during their stay in the hospital. Additionally, RN understaffing two days before the onset of infection and regardless of the unit showed a 15% higher infection rate than the days where RN staffing was above 80% of the unit median (Shang et al., 2019). The p-value for RN understaffing of both shifts before the onset of infection is 0.024. Finally, the authors suggest that there is a need for the implementation of solutions to address staffing problems (Shang et al., 2019).

Assumptions

The authors' conclusions seem to be predicated on the supporting data surrounding understaffing and the development of HCAIs. Shang et al. (2019) believe that their research uses better data and design, which supports the reliability of their methodology and conclusion. Shang et al. (2019) admit that they are unaware of the possible causes and circumstances surrounding understaffing.

Deficit/Conclusion

The student believes that Shang et al. (2019) showed technical ability and thorough dataset analysis. Their conclusion is well supported by prior studies on the relationship between understaffing and the development of HCAIs. The article displays the need for comprehensive solutions for staffing problems that are becoming more commonplace in many healthcare systems. Without addressing the human resource deficit, clients are at risk of adverse outcomes and increased financial costs related to HCAIs.

Results of the Chlorhexidine Gluconate Bathing implementation intervention to improve evidence-based nursing practices for prevention of central line associated bloodstream infections Study (Changing Baths): a stepped wedge cluster randomized trial

Intrusive medical interventions and procedures always run the risk of infections. Reynolds et al. (2021) presents the result of central line-associated bloodstream infections (CLABSIs) prevention program. The study's primary goal is to assess the effect of Chlorhexidine Gluconate Bathing intervention for patients with central lines.

Key Points

Reynolds et al. (2021) employed a cluster randomized, stepped wedged cross-sectional evaluation of the effect of specialized intervention strategies on nursing staff compliance. The authors chose a randomized cluster design to minimize the risk of cross-contamination throughout the study period. The study took five months, and the implementation program spanned four months. After 12 months of the initial intervention, Reynolds et al. (2021) used educational outreach visits and feedback strategies to assess the sustainability of the interventions. The main participants in the study are two major hospitals in the southeastern region of the United States. Reynolds et al. (2021) report a 27.4% reduction in CLABSI after the intervention. Although remarkable, the reduction in CLABSI is not statistically significant but is clinically significant. More importantly, the authors found that the staff members' knowledge and perception of Chlorhexidine Gluconate bathing practices improved.

Assumptions

The authors conclude that booster sessions, including education and feedback, increased compliance with evidence-based practices (Reynolds et al., 2021). According to Reynolds et al. (2021), educational feedback and outreach improved compliance with Chlorhexidine Gluconate processes over 12 months. The authors believe that CLASBIs are preventable as current literature provides evidence of Chlorhexidine Gluconate's effectiveness in preventing infections.

Deficit/Conclusion

The student agrees with Reynold et al. (2021)'s conclusion that feedback and outreach effectively improve compliance with Chlorhexidine Gluconate processes and evidence-based practices. The outreach visits provided education and reinforcement of nurses' knowledge to comply with the proposed interventions. The visits also identified weaknesses and knowledge

gaps related to compliance. Nurses must be aware of their responsibility to prevent infections, especially life-threatening infections like CLASBIs. Adequate and accurate knowledge of protocols and interventions is crucial in fulfilling the nurses' role in promoting positive patient outcomes. Reynold et al. (2021) mention that CLASBIs result in an added burden of $2.3 billion dollars worth of medical costs.

Conclusion

HCAIs affect patients and healthcare staff in different ways. Patients endure more suffering and stay longer in the hospital to treat HCAIs—the healthcare system experience a financial burden from HCAI treatment and management. CLASBIs cost the healthcare system $2.3 billion annually (Reynolds et al., 2021). Nurses have an exemplary role in alleviating financial burdens and improving patient outcomes. Nurses are also active participants in quality improvement, and nurses must be willing to comply with protocols, guidelines, and proposed interventions.

References

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