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CLINICAL RESEARCH ARTICLE

Implementing a pressure ulcer prevention bundle in an adult intensive care

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KEYWORDS
Care bundle;
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Summary
Background: The incidence of pressure ulcers (PUs) in intensive care units (ICUs) is high and numerous strategies have been implemented to address this issue. One approach is the use of a PU prevention bundle. However, to ensure success care bundle implementation requires monitoring to evaluate the care bundle compliance rate, and to evaluate the effectiveness of implementation strategies in facilitating practice change.
Aims: The aims of this study were to appraise the implementation of a series of high impact intervention care bundle components directed at preventing the development of PUs, within ICU, and to evaluate the effectiveness of strategies used to enhance the implementation compliance.
Method: An observational prospective study design was used. Implementation strategies included regular education, training, audit and feed-back and the presence of a champion in the ICU. Implementation compliance was measured along four time points using a compliance checklist.
Results: Of the 60 registered nurses (RNs) working in the critical care setting, 11 participated in this study. Study participants demonstrated a high level of compliance towards the PU prevention bundle implementation (78.1%), with 100% participant acceptance. No significant differences were found between participants' demographic characteristics and the compliance score. There was a significant effect for time in the implementation compliance (Wilks Lambda = 0.29, F (3, 8) = 6.35, $p < 0.016$), indicating that RNs needed time to become familiar with the bundle and routinely implement it into their practice. PU incidence was not influenced by the compliance level of participants.

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Conclusion: The implementation strategies used showed a positive impact on compliance. Assessing and evaluating implementation compliance is critical to achieve a desired outcome (reduction in PU incidence). This study's findings also highlighted that while RNs needed time to familiarise themselves with the care bundle elements, their clinical practice was congruent with the bundle elements.

Implications for Clinical Practice

- Assessing the effectiveness of bundle implementation is a key element for the translation of evidenced based interventions to clinical settings.
- Utilising different strategies during the implementation phase enhances the translation of knowledge to real practice.
- Measuring compliance can provide a full understanding of the level of implementation in the real world and minimise error in the interpretation of the study's outcomes.
- There was a positive relationship between increased practitioners' familiarity with, and increased compliance to, the care bundle in the ICU context.

Introduction

Pressure ulcers (PUs) are a common phenomenon among high risk hospitalised patients, with incidence rates documented as high as 40% (Berlowitz, 2014; Tayyib et al., 2015a). Many studies report that hospital-acquired PUs (HAPUs) have significant associations with high morbidity and mortality rates, infection rates and financial costs (Bennett et al., 2004; Dantas et al., 2013; Vollman, 2010). However, despite several prevention strategies proposed to assist healthcare teams in utilising high quality care to prevent PU development, especially for high risk patients in intensive care units (ICUs) (Coyer et al., 2015; Tayyib et al., 2015b), a gap between recommended care and real practice usually exists (Shahin et al., 2008). In Saudi Arabia, for example, PU incidence in ICU is reportedly high (39.3%), with a noted low compliance rate to PU prevention standard care such as repositioning regimen every 2 hours (Tayyib et al., 2015a,b).

The benefits of evidence based practice interventions cannot be maximised without consideration of compliance with intervention guidelines. Thus, the next challenge is to address compliance of intervention implementation in the hospital setting. Implementation, evaluating and testing the effectiveness of PU prevention strategies to reduce PU incidence in clinical settings, particularly in the ICU, can pose challenges to researchers, as effective implementation, while required, can be difficult to attain.

It is suggested that effective implementation could be achieved through a high level of compliance to guidelines (Ebben et al., 2013). Evidence highlights that the compliance rate to guidelines would be increased by utilising a care bundle approach (Fulbrook and Mooney, 2003). A care bundle approach, ''all or nothing'', is based upon holistic principles, whereby the whole is greater than the sum of its parts, and is an approach with which most intensive care clinicians are familiar. However, this approach does not adequately reflect the magnitude of the effectiveness of the implementation as it disregards the process of implementation and factors that influenced compliance. The compliance assessment should include the implementation compliance rate, and the contributory factors that influence the implementation compliance such as the bundle itself, providers, patients and/or the environment (Greenhalgh et al., 2004).

However, compliance to interventions can also be enhanced through multiple transfer strategies such as education and training, which will potentially empower ICU clinicians and increase their confidence in achieving positive changes in practice (Paul et al., 2014). Thus, close monitoring of all implementation transfer strategies is required, including education, training, audit and feedback (Logan et al., 1999). To date, there is a paucity of studies that demonstrate how the intervention was implemented, and what strategies could improve compliance to the bundle.

Measuring the effectiveness of the PU prevention bundle implementation, through compliance to the bundle, is crucial to provide a comprehensive understanding of the quality of the bundle and its implementation, which can be especially useful in effectiveness trials within clinical settings (Ebben et al., 2013). Through evaluation of the effectiveness of the implementation of the bundle, the extent to which the bundle has been accepted and put into practice by ICU clinicians and affected the process of care will be determined (Ebben et al., 2013; Greenhalgh et al., 2004). This also ultimately leads to an exploration of barriers that influence the compliance, and appraisal of the link between bundle implementation and research outcomes. In addition, it will increase the opportunity for replicating the study in different settings to achieve the same findings.

This paper reports the findings of a sub-study evaluating the extent of the compliance to a complex intervention within a main study, which tested the effectiveness of a PU prevention bundle in improving skin integrity in the ICU (Tayyib et al., 2015b). The PU prevention bundle combined the latest international guidelines (available at the time of the study) for PU prevention (European Pressure Ulcer Advisory Panel and National Pressure Ulcer Advisory Panel, 2009) with PU prevention strategies related to medical devices (removed for blind review). The key elements

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