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Nurses' perceptions of the sustainability of a standardised assessment for preventing complications in a ICU: a qualitative study

Kim Lam Soh,[1*] Patricia M Davidson, [2,3] Gavin Leslie,[4] Michelle DiGiacomo,[3] Kim Geok Soh[5]

[1]Department of Nursing and Rehabilitation, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, Malaysia; [2]John Hopkins School of Nursing Baltimore, MD USA, [3]University of Technology Sydney, Australia; [4]Curtin Health Innovation Research Institute, Curtin University, Australia; [5]Department of Sport Studies, Faculty of Educational studies / Sport Academy, Universiti Putra Malaysia, Malaysia.

*Corresponding author
Kim Lam Soh, RN, MHSc, PhD
Associate Professor
Department of Nursing and Rehabilitation, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, Malaysia..
email: sklam@upm.edu.my
Office: +60 3 89472439
Orchid ID: 0000-0003-2404-828X

Patricia M. Davidson, RN, BA, MEd, PhD
Dean,
John Hopkins School of Nursing
Professor
University of Technology Sydney, Australia
email: pdavids3@jhu.edu
Office: +1 410 9557544
Orchid ID: 0000-0003-0299-6289

Gavin Leslie, RN, PhD, B. App. Sc., Post Grad Dip (Clinical Nursing), FRCNA
Professor of Critical Care
School of Nursing and Midwifery, Curtin Health Innovation Research Institute, Curtin University, Perth, Australia
email: G.Leslie@curtin.edu.au
Office: +61 8 9266 2070
Orchid ID: 0000-0001-8939-9801

Michelle DiGiacomo BA MHlth(Hons) PhD
Associate Professor
University of Technology, NSW 2008, Australia
email: Michelle.DiGiacomo@uts.edu.au
Office: +61 2 9514 4818
Orchid ID: 0000-0001-5484-8224

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Kim Geok Soh MS(Sport Science), PhD(Physical Education & Health)
Associate Professor
Department of Sport Studies, Faculty of Education/ Sport Academy, Universiti Putra
Malaysia, Selangor. Malaysia.
email: kimgeoks@yahoo.com
Office: +60 3 89468153
Orchid ID: 0000-0002-5273-2700

*Corresponding author. Email: sklam@upm.edu.my

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Nurses' perceptions of the sustainability of a standardised assessment for preventing complications in a ICU: a qualitative study

Background: Quality improvement projects have been widely adopted internationally to prevent complications in the ICU.

Objective: This paper describes nurses' perceptions of implementation strategies and the potential sustainability of a practice change intervention to prevent complications in a Malaysian ICU.

Design: A participatory action research using five focus group discussions were undertaken with 19 nurses in a single ICU in regional Malaysia. Focus group transcripts were analysed using the method of thematic analysis.

Results: The main themes derived from the interviews were: [1] Empowering staff to embrace evidence-based practices; [2] Staff knowledge, attitudes, and beliefs that impact on behaviour; and [3] management support and leadership are influential in staff behaviours (acceptance & perseverance of change process).

Discussion: Resistance to change was recognized as a barrier to adopting evidence based recommendations. There is a need to improve nurses' knowledge, attitude and awareness of the importance of assessment for ventilator-associated pneumonia, catheter-related blood stream infection and pressure injuries in the ICU.

Conclusion: These findings emphasise the importance of including both individual and organizational factors in strategic planning for clinical practice improvement.

KEY WORDS Malaysia; Clinical practice improvement; Intensive care unit; qualitative study

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Impact statement

This study highlights the importance of including both individual and organizational factors in strategic planning for practice change and quality improvement in nursing practice.

Introduction

The growing pressure to reduce healthcare-associated complications which have major economic and clinical impacts has moved health care providers to review their practice to provide improved patient care. Internationally, major foci for quality improvement initiatives have been undertaken to address preventable adverse events in ICU include sepsis management(Gerber, 2010) and prevention of complications, such as catheter-related blood stream infection (CRBSI),(P. J. Pronovost et al., 2010; Sawyer et al., 2010) ventilator-associated pneumonia (VAP)(Bouadma et al., 2010; Rello, Lode, Cornaglia, & Masterton, 2010) and pressure injuries (PIs)(Crumbley & Kane, 2010; Riordan & Voegeli, 2009). The majority of strategies to reduce VAP, CRBSI and PI complications fall principally within the context of basic nursing care. A core set of nursing activities were identified as important in preventing VAP, CRBSI and PI in the ICU. Implementing these activities, namely a strict hand washing protocol, hygiene care, positioning of the patient, elevation of the head of the bed and providing adequate nutrition, are advocated in preventing these complications in the ICU. Some of these activities are included in the evidence-based practice (EBP) guidelines recommended for implementation in ICUs.(Crumbley & Kane, 2010; Eman, Theo, & Ruud, 2009; Peter Pronovost, 2008; Sawyer et al., 2010) However, on the other hand some ICU nurses may have the notion that hygiene and mobility have much lower priority than titrating vasoactive infusion or monitoring of hemodynamic status (Papastavrou, Andreou, & Efstathiou, 2014; Vollman, 2006). By placing evidence-based hygiene and mobility strategies in a comprehensive program designed to reduce adverse events in ICU it can help move these

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practices to a higher priority as perceived by nurses in the list of care activities (Vollman, 2006).

VAP, CRBSI and PI are associated with high expenditure, prolonged recovery periods and length of stay, and increased morbidity and mortality (Battaglia & Hale, 2018; Graves et al., 2010). Applying EBP to prevent practices that are unsafe or that lack empirical support is important to increase efficiency and improve the health care quality (Boltz, 2011). A number of studies have been undertaken to improve the quality of care by increasing the uptake of EBP recommendations (Goldstein et al., 2018; Mermel et al., 2009). However, the process of implementation of EBP is not always easy and barriers have been recognised at the provider and health system levels (Wallace, Nwosu, & Clarke, 2012). Many studies have been conducted on promoting adherence to clinical guidelines in the Western world (Gould, Moralejo, Drey, Chudleigh, & Taljaard, 2018; Wallace et al., 2012).

Yet in many countries, such as Malaysia, research about the problems faced by nurses in implementing and sustaining EBP is limited. Nurses play an important role in supporting EBP environments and implementing change by stimulating collaboration and discussion within interdisciplinary teams. To date, Malaysian studies have focussed on reporting baseline surveillance of nosocomial infections, specific management strategies, antibiotic regimens and mortality rates (Tan, Zanariah, Lim, & Balan, 2007; Zakuan, Azian, Mahamarowi, & Md Radzi, 2009). Implementing EBP guidelines has resulted in significant improvements in the process of care (Grimshaw et al., 2006). Adhering to guidelines is challenged by barriers at the patient, professional, health care team, health care organization and practice environment levels (Grol, 1997). The change process creates stress and may cause conflict in the clinical setting due to the challenging of traditional roles, expectations and relationships (Chang, Hancock, Johnson, Daly, & Jackson, 2005; Vivar, 2006). Instances of personal animosity, mistrust and communication gaps have been identified (Azoulay et al.,

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2009). As a consequence, conflicts need be identified and managed at an early stage (Vivar, 2006). Consideration of the organisational context, culture and relationships is vital in resolving conflict (Tsai, 2011; Vivar, 2006). Understanding organisational culture, such as staff characteristics, the patient care environment, the department and variations in hospital culture, is crucial in driving change (P. Pronovost & Sexton, 2005; Wallace et al., 2012). Therefore, it is important to evaluate organisational acceptability and sustainability of EBP, within the context of developing country healthcare systems. This study describes nurses' perceptions and challenges of implementing EBP strategies and potential sustainability of practice change to prevent complications in a Malaysian ICU, focusing on preventing three major ICU-related complications: VAP, CRBSI, and PI.

This paper describes the findings from post-intervention focus group discussion following an action research project (Soh et al., 2011; Soh, Davidson, Leslie, DiGiacomo, & Soh, 2013). The aim of the intervention was to empower nurses to critically evaluate their practice and implement a core set of behaviours to prevent VAP, CRBSI, and PI. The intervention included tailored and targeted approaches including: evidence-based education, distribution of research articles, and feedback on hand hygiene practice. In this study the nurses were the main focus but physicians were also involved in implementing the intervention and provided support.

The action research in this study was divided into: *Pre-intervention* (December 2009) (Soh et al., 2011), Intervention (February to July 2010) (Soh et al., 2013), and Post-intervention (March to June 2011). The post-intervention phase was conducted after a seven month "cooling off" period to evaluate the sustainability of change in clinical practice. This cooling period was allowing for the changes to be enacted and become embedded in nursing practice.

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During the post-intervention phase, patient profiling and nurse survey as the pre-intervention phase were conducted to evaluate the sustainability of clinical practice in the ICU. The focus group was undertaken to capture the participants' view on their experience of the practice changes introduced including the barriers and facilitators to change in preventing VAP, CRBSI and PI and issues for sustainability. This method of data collection is useful to obtains a range of views, some not even anticipated by the researcher (Betts, Baranowski, & Hoerr, 1996), and explore the collective view and culture in the work environment (Tong, Sainsbury, & Craig, 2007). Focus groups are also helpful for exploring people's knowledge, perspectives, attitudes, and experiences about issues and seek explanation for behaviours in a way that would be less easily accessible in responses to direct questions (Halcomb, Gholizadeh, DiGiacomo, Phillips, & Davidson, 2007; Wong, 2008). Particularly exploring view on what people think, how they think and why they think that way (Wong, 2008).

The consolidated criteria for qualitative studies by Tong et al. (2007) were used to guide and report the study included personal characteristics of research team such as researchers credentials, study design, data analysis and reporting. The theoretical framework describe in Tong et al. also consist of methodological orientation underpin the study eg content analysis to describe, quantify and organise data systematically into a structured format (Downe-Wamboldt, 1992). Other concerns in Tong et al. that were also been taken into consideration in this study include participant selection, setting, and data collection process.

In this study content thematic analysis was used as a basis for understanding of the findings on transcriptions of the focus groups. Content analysis also provide knowledge, understanding and new insight of the phenomenon under study (Downe-Wamboldt, 1992; Elo & Kyngäs, 2008; Woo & Heo, 2013). This approach achieved a condensed and inclusive description of the phenomenon, and the outcome of the analysis is concepts or categories describing the phenomenon (Elo & Kyngäs, 2008). Through content analysis it is possible to

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condense words into fewer content related categories (Elo & Kyngäs, 2008; Hsieh & Shannon, 2005). The action research project activities and data collection process were summarised in Figure 1.

Insert Figure 1 here.

Methods

Design

A participatory action research was undertaken using the focus group discussion.

Setting

The study was conducted in a closed medical surgical ICU directed by an intensivist at a Ministry of Health hospital in Malaysia. This ICU is categorise as Level 3 with facilities for multiple organ support, such as mechanical ventilation and renal replacement.(Malaysian Registry of Intensive Care, 2009) The 17-bed ICU had 72 to 111 admissions a month from January 2010 to May 2011. The staffing is normally 15 to 17 nurses per shift, and three shifts a day. The nursing care is coordinated by five ward managers.   The nurse patient's ratio is 1 to 1 or 2 depending on the patient's condition. This ICU is practising total patient care where the registered nurse is responsible for giving total care to patient. Other healthcare professionals such as physiotherapy, dietitian, and pharmacy also involve in the care delivery and treatment on daily basis or when needed.

Participants

This ICU consists of 87 permanent registered nurses. There was a wide range of clinical experience amongst the nurses, with the majority holding diploma or certificate qualifications. There are 42 (48.3%) nurses had an intensive care nursing post-registration qualification.

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Only 5 of 87 (5.7%) nurses had baccalaureate qualifications. The participants included in the focus group were nurses who worked in the day shifts from May to June 2011. The rationale for the focus groups to recur in this stage was explained to the potential participants and they were advised that participation was voluntary before they were allotted to one of five focus groups. The exclusion criteria for this study were nurses who were not permanently assigned to the unit.

Data collection

The group discussions were conducted to obtain the participants' views on maintaining the VAP, CRBSI and PI assessment tools in their daily practice and their views on the practice change intervention. The participants were approached during working hours and invited to participate in the focus group discussion by the researcher (KLS) who is the academic staff in a different public organization at the central region of Peninsular Malaysia. There is no issue of power imbalance and the participants were ensured that they will remain anonymous. All discussions were conducted in Bahasa Malaysia by the researcher who is bilingual with more than 10 years critical care nursing and nursing research experience in Malaysia. Each focus group lasted 30 to 40 minutes.

The discussions were held in the ICU family meeting room and audio recorded with consent of the participants. Field notes were compiled after each event to document the discussion. The topics included the nurses' perception of change in assessment tools over the previous 12 months, barriers and facilitators to sustaining the change, experiences using the tools, and suggestions on how the change should be introduced, implemented and sustained in the future.

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Ethical considerations

Approval to conduct the study was granted by a university ethics committee and the Malaysian Ministry of Health Research Ethics Committee.

Data coding and analysis

Recorded focus group proceedings were transcribed verbatim in Bahasa Malaysia to preserve the nuances of conversation (Cao, DiGiacomo, Du, & Davidson, 2009). Each participant was asked to review their group transcript to ensure accuracy of the proceedings. An inductive way of thematic analysis was used by coding and themes development was directed by the content of the data. Preliminary analysis included multiple readings of the transcripts and note taking. Following this, all transcripts were reviewed and categorised by meaning using colour coding by the researcher (KLS). The process of theme verification continued until consensus was reached with the research team member.

Results

Five focus groups were undertaken with a total of 19 participants. The participant characteristics are presented in Table 1. The main reasons provided for nurses not participating in group discussions were that the nurses were *too busy*. Three overarching themes emerged from analyses of the discussions on practice change experience and associated factors: 1) empowering staff to embrace EBPs; 2) staff knowledge, attitudes and beliefs impact on maintenance of practice change; and 3) workplace culture/need for management-driven change to influence staff behaviour change. Excerpts from the group discussions are presented in Table 2 and these issues are summarised below.

Insert Table 1 here.

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Insert Table 2 here.

Empowering staff to embrace EBPs

Overall, participants provided positive feedback on the change process. One said that she had learnt much and improved her assessment skills particularly for PI. They also said that the practice of hand washing, mouth care and elevation of head of the bed had improved considerably during the course of the programme.

> ...there is improvement such as mouth toilet, hand washing for staff and visitors are improving a lot. Head of bed elevation we always remember to prop up the patients even without using the stick that you have provide to us.

Although many admitted that they did not use the specific assessment forms, they applied this systematic process to their assessment and communicated this to their peers. They claimed that they understood the appropriateness and relevance of information in the Waterlow assessment but struggled with multiple forms. They did not document PI assessment on the form but in their nursing report. They suggested incorporating the Waterlow assessment form in the hospital information system so that it forms part of the routine nursing assessment and is easier for all nurses to complete. But the decision for this to occur must come from the nurse manager in order to firmly embed this practice.

> Waterlow pressure injury is good. Need to be continued but need to be included in hospital information system. If still used paper it might be drop outs. If compulsory to do it we will do. I think if sister (ward manager) asks to do, they will also do it (nurse who refused to do Waterlow assessment).

Staff knowledge, attitudes, and beliefs that impact on behaviour

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The nurses described the knowledge, attitudes and beliefs of staff impacting on undertaking and maintaining assessment tools with patients and modifying their practice. They discussed aspects of a competing change initiative involving the information technology system which inhibited maintaining changed assessment practices.

> Too busy with paperless. After we start using hospital information system in one to two month, we felt very headache using the computer.

Their clinical judgements and knowledge of pressure injury staging were also considered to impact on their assessment practices because some nurses have perception that stage two PI or above only reported as PI. During the period of the change process, a new information technology system was introduced. Competing demands in an already busy working environment created conflict. The nurses lacked knowledge and skills in the use of the information technology system. A barrier to implementing the change that they identified was implementation of the *Hospital Information System* which caused them to neglect the assessment of PI as they had a hard time learning the computer skills. One nurse said that a change of practice was taking place before the hospital implemented information technology system. After the hospital information system was started, the nurses focussed so much on using the system that the changed practice lapsed.

Issues in clinical knowledge were also evident from the discussion. It was apparent that some nurses lacked knowledge about PI staging and had different ideas on staging PIs. Only skin break down, as in Stage 2 or above PI - as defined by the National Pressure Ulcer Advisory Panel (2007) – were considered by some nurses to be a PI. Therefore, Stage 1 PI would have been missed.

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> From my understanding these nurses perceived that when the skin is tearing only they identify it as bed sore.

The nurses felt a need for continual reinforcement of preferable practices the work in the unit as counselled by the proverb: *Tap the nail with a hammer,* which means that to make things happen, someone must continuously apply pressure, otherwise the work will grind to a halt.

Beliefs in the hierarchical status / positioning of nurses and doctors were revealed in the interviews. One nurse said that nurses think they were only handmaidens to the doctors; therefore, the doctors should assess for PI. They could not differentiate between their and the doctors' responsibility, which resulted in overlooking the PI assessment.

> They like to listen to the doctor…She think that she work under doctor even bedsore she expect doctor to check. Which one is doctor or nurse's job she also doesn't know how to differentiate.

A common problem encountered was resistance to change and varying levels of acceptance to change among the individual nurses. This project was not prioritised by the ward staff in spite of the use of action research framework and attempts to engage ownership. The nurses' perception of the priority of the intended practice changes was not always apparent, due to the feeling that it is someone else's work and does not concern them. The motivation to collect data was reduced because of the perception that this was 'research' reflecting a reticence to internalise these practice change.

Workplace culture: need for management-driven change to influence staff behaviour change

 Executive support for practice change was identified as critical and the importance of doctors sanctioning the practice change. Given the hierarchical model of organisation in the ICU, this

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is an important observation. A nurse also said that in order to make change happen in the unit, the management must emphasise and endorse the change. For example, the nurses knew that assessment of PI was important but if not emphasised by the management, the need for documentation and monitoring the outcomes will not be successful.

I think factor that can help is the boss also helps to make the change successful, give the staff cooperation with the change. The boss needs to say and emphasis that the change needs to be done.

Discussion

This study describes nurses' perceptions of implementation strategies in an action research project and the potential sustainability of a practice change in preventing complications in ICU. The focus group discussions suggested the multifactorial to barriers and facilitators to sustaining change in this unit. Barriers identified included the nurses' knowledge, attitude and beliefs that impact on behaviour. The nurses lacked clinical knowledge such as staging PIs and implementing y information technology system in the ICU. Moreover, embedded hierarchical structures impeded autonomous engagement as well as a reliance on the supervisor's direction.

A lack of knowledge is also associated with a lack of initiative that creates ambivalence and resistance to change. Birks et al.(2009) used the S.J. Robert (2000) five-stage model (process of nurses rising above oppression) to illustrate how Malaysian nurses stand in the model. They placed Malaysian nurses in the first stage - *unexamined acceptance* - which means acceptance of the status quo and their role in the organisational status. A systemic review of eleven studies with a sample size of 248 to 8100 health care providers found that lack of awareness was found as high as 82% for possible barriers to uptake of research evidence (Wallace et al., 2012).

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Responses of nurses also reflected complacency with current practices. In their discussions, some felt that their 3-year nursing diplomas were sufficient making them *excellent nurses*. Therefore, they were reluctant to change, thinking that they were already providing the *best* care to their patients. With the current evolving health care system the ways in which nurses were educated in the 20th century are no longer adequate for dealing with the realities of health care in the 21st century (Institute of Medicine, 2010a; Vila, Zhuang, Tan, & Thorne, 2018). As the care environment and patient need's become more complex nurses need competencies requisite such as leadership, research, EBP, teamwork and collaboration to deliver high quality care to patients (Institute of Medicine, 2010b; Scott & Miles, 2013). In order for nurses to fill in the expanding roles and to master technological tools, information management system while collaborating and coordinating care across team of health care professionals they need to be better prepare through education (Institute of Medicine, 2010a; Williams, Sisk, Souter, Walker, & Wolf, 2019).

Value of evidence in research

Nurses did not appear to appreciate the value of translational research activities. They perceived any change proposed as part of other people's study or others doing research, and not to be part of their routine practice. Nurses with these views place a low priority on research which they just assume to be other people's work. This was reflected in them not doing the Waterlow PI assessment because they considered it for "research" and they have carried out PI assessment in their routine work, although this was not systematically documented by valid and reliable methods. A previous study evaluating perception of EBP among medical doctors, allied health staff as well as nurses in Malaysia also found that 46.2% of 52 allied health staff indicates that "EBP is too tedious and impractical" and 61% agreed that "the importance of EBP in patient care is exaggerated" (Lai, Teng, & Lee, 2010). On the

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contrary, the majority of nurses in a Western country professed a lack of knowledge in VAP prevention strategies (Biancofiore et al., 2007).

A recent survey in Italy, discovered that majority of nurses (n=449) appreciated the useful of evidence-based guidelines in identifying and selecting appropriate interventions for patients (Filippini, Sessa, Di Giuseppe, & Angelillo, 2011). They were also confident about the positive impact of EBP to improve patient outcomes. This finding suggests that there is a different in perception of research utilisation to improve nursing practice between nurses in this setting and nurses in the Western countries. The findings also indicated that nurses may have lost interest in the data collection due to the duration of the project. They considered that they had gleaned important information, embedded this in their practice and the process of documentation was tiresome.

Despite the importance of research for professional development, in this workplace focus group data revealed that nurses did not always place a high value on research in improving patient care. This could be due to the fact that the majority of the nurses were only diploma holders with only 5 (5.7%) having a degree, and therefore having less knowledge and awareness of research in improving clinical practice. Similarly, Wallace et al. (2012) also found that of seven surveys in their review assessing lack of perceived usefulness of research as possible barriers to the uptake of evidence was as high as 95% among the health care providers. The perception of the value of research in improving practice is likely higher in those with lower levels of educational preparation.

Structural barriers

In Malaysia, the nursing as a professional is in its infancy (M. Birks et al., 2009) Baccalaureate preparation is still not the minimum requirement for registered nurse (M. Birks et al., 2009). Although exposed to the basic concepts of research at the diploma level, many

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nurses in Malaysia still have poor access to computer and library facilities including databases that deter the staff in the hospital to get any free current journal article. Nurses also are isolated from expert support, denying them the opportunity to see the relevance of research to practice. A review undertaken by Wallace et al. (2012) showed that of five studies investigated 10 external environment barriers to uptake the evidence found more than 10% of the participants cited lack of resources as the possible barriers. This review was based on the Western health care system which is more advance especially in term of facilities available therefore the possible barriers could be larger in the developing county such as Malaysia.

Moreover, the fact that most research is published in English makes it difficult for those whose first language is not English (Kajermo et al., 2010). Patient care continues to become more complex with nurses having to make critical decision, use of more sophisticated life saving technology and information management system that require skills in analysis and synthesis (Institute of Medicine, 2010b; Nyström, Karltun, Keller, & Gäre, 2018). A more educated nursing workforce are require to fulfill the requirement of evolving health care demand (Institute of Medicine, 2010b; Scott & Miles, 2013).

During the post intervention phase the hospital information system was started (in January 2011), and many nurses had difficulty in learning the system, and placed less emphasis on the Waterlow PI assessment. Limited processes of paper documentation were still in used, such as for patient medication, daily treatment chart, and nursing care plan. It would be expected that when the information technology system was implemented nurses spent less time for charting and more time for patients care. A study on implementation of a clinical information system in an ICU found that patient care took 81.1% of the total nurses' working time in 2000 and 86.6% in 2002 (Saarinen & Aho, 2005). The time used to document the nursing care increased by 3.6% (P>0.05), or 15 min after implementation of the clinical information system. Perhaps in this study nurses need more time learning the system

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because introducing a hospital information system in this setting has represent a major change in practice which is distracting, time consuming and might displace other nursing care activities.

Educating nurses is important because the knowledge gained provides the basis for greater awareness. Awareness is necessary to help nurses understand their capacity to contribute to preventing hospital-acquired infections through effective and sustained behaviour change (Bagnasco et al., 2019; Mathai et al., 2010; Wallace et al., 2012). Knowledge also influences behaviour directly and is essential for the individual to evaluate any threats faced, and to understand that a given behaviour can counteract or increase the threat(s) (Mathai et al., 2010; Wallace et al., 2012). A study on 168 of the 210 adult acute care general hospitals in Pennsylvania found that every 10% increase in the proportion of nurses holding a bachelor degree was associated with a 5% decreased the risk of mortality and failure to rescue (Aiken, Clarke, Cheung, Sloane, & Silber, 2003). This finding had proved that hospital employment of nurses with bachelor degree and higher degrees is associated with improved patients outcomes (Aiken et al., 2003; Sage & Harris, 2018).

Nurses and doctors relationship

Nurses said there challenges with nurse/doctor relationships particularly with the distribution of power. The power relationship between doctors and nurses are well documented and frequently results in difficult team work, partly because the professions are not considered equal within the health (Kenaszchuk, Wilkins, Reeves, Zwarenstein, & Russell, 2010). Internationally, many studies have reported the relationship impacting on the change process (Gunnarsdóttir, Clarke, Rafferty, & Nutbeam, 2009; Liu et al., 2018) but there have been limited studies in Malaysia. One found that Malaysian nurses face lack of recognition, unfavourable conditions of employment and gender inequality (M. J. Birks et al., 2009). It is

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widely understood that the nurse-physician relationship can impact on patient care. The quality of patient care delivered is highly dependent on the workplace environment – whether there is a good / bad working relationship between the doctors and nurses (Kenaszchuk et al., 2010). Therefore, implementing supporting collaborative work strategies will help foster collegial work practices and communication.

Executive support

The lack of management support for change was demonstrated by the limited involvement in the monitoring and checking of leadership being driven by the medical team. A survey found that the nurses need to be supported and mentored by their leadership throughout the research utilization process (Fink, Thompson, & Bonnes, 2005). They identified the lack of support and mentoring as the top three barriers to the use of research findings in practice. Collaborative environments help nurses to engage in effective conflict management strategies and, ultimately, their units' ability to work effectively (Nyström et al., 2018; Siu, Spence Laschinger, & Finegan, 2008). A supportive culture emphasizing team work with high standards is more likely to perform better than one emphasizing competitiveness or concerned with how well people fit in (Cooke & Rousseau, 1988; Liu et al., 2018). This is due to high pressure for work performance which would require considerable coordination and communication across a wide range of caregivers (Shortell et al., 1994). According to Shortell et al.(1994), a team-satisfied culture that emphasizes self-expression, achievement, cooperation, and staff development is most likely to be associated with better unit performance.

Despite the barriers to change in practice found in this study, some of the nurses were optimistic that at least some change had taken place; they will continue to improve the sustainability of the patient assessment in their patient care. They also positively will improve

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3   their knowledge on assessment of patients and some of their common practices in the ICU.
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5   Competing demands and the focus on the new IT system took their focus from the project.
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10   **Impact Statement**
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12   Anticipating competing demands is important to consider in implementing change processes
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14   in the clinical setting. In spite of striving to adopt an action research project, it was apparent
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16   that engaging leadership support as part of this project was not as successful that it could have
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18   been. A potential explanation can be that there was a mismatch between the collaborative and
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20   empowering model of action research and existing nursing practice patterns.   Another
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22   possible reason is embedded in the Malaysian cultural context such as hierarchical structure,
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24   (Macoby, 1994) maintaining balance (Swierczek, 1994) and respecting the elder / senior
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26   (Asma, 1996) in the nursing team. These data underscore the importance of considering
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28   cultural factors, both organisational and societal in quality improvement initiatives.
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34   **Limitations**
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36   The sampling method for data indicates that the findings from this study cannot be
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38   extrapolated to other ICUs, particularly the fact that purposive sampling was used.   In
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40   addition multiple realities exist where the researchers have outlined personal experiences and
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42   viewpoints in this study that may have resulted in methodological bias (Noble & Smith,
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44   2015).   Further, due to hierarchical workplace culture, the participants may not have
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46   expressed unpopular views to avoid cultural or peer pressure. The data reported were dated
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48   more than eight (8) years old. Therefore, there is possibility of systems and politics change
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50   that have occurred in this ICU setting. Nonetheless, this finding provides information that can
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52   be used to assist future quality improvement initiatives in ICU signals important information
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54   for quality improvement initiatives in developing nations.
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Conclusions

This study has demonstrated that some nurses in this ICU still have low perceptions about the importance of assessment and documentation for VAP CRBSI and PIs. Lack of autonomous engagement and dependent on the supervisor's direction in sustaining the change process in this study is embedded by the hierarchical structures in the organisation. This study will help future managers, researchers and policy makers understand the clinical milieu so that they can find their way through the complex, iterative and organic process of translating evidence to practice.

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3   **References**
4
5   Aiken, L.H., Clarke, S.P., Cheung, R.B., Sloane, D.M., & Silber, J.H. (2003). Educational
6   levels of hospital nurses and surgical patient mortality. *The Journal of the American*
7   *Medical Association, 290*(12), 1617-1623.
8
9
10   Asma, A. (1996). Going Glocal: Cultural Dimensions in Malaysian Management. Kuala
11   Lumpur: Malaysian Institute of Management.
12
13   Azoulay, Elie, Timsit, Jean-Francois, Sprung, Charles L., Soares, Marcio, Rusinova, Katerina,
14   Lafabrie, Ariane, . . . Schlemmer, Benoit. (2009). Prevalence and factors of intensive
15   care unit conflicts: The conflicus study. *American Journal of Respiratory and Critical*
16   *Care Medicine, 180*(9), 853-860. doi: 10.1164/rccm.200810-1614OC
17
18   Bagnasco, Annamaria, Zanini, Milko, Catania, Gianluca, Aleo, Giuseppe, Sermeus, Walter, &
19   Sasso, Loredana. (2019). *Implications of a wide-scale educational intervention to*
20   *engage nurses in evidence-based practice: The Italian RN4CAST experience.* Paper
21   presented at the Nursing forum.
22
23   Battaglia, Christopher C, & Hale, Kaye. (2018). Hospital-acquired infections in critically ill
24   patients with cancer. *Journal of intensive Care Medicine*, 0885066618788019.
25
26   Betts, N.M., Baranowski, T., & Hoerr, S.L. (1996). Recommendations for planning and
27   reporting focus group research. *Journal of Nutrition Education, 28*(5), 279-281.
28
29   Biancofiore, G., Barsotti, E., Catalani, V., Landi, A., Bindi, L., Urbani, L., . . . Filipponi, F.
30   (2007). Nurses' knowledge and application of evidence-based guidelines for
31   preventing ventilator-associated pneumonia. *Minerva Anestesiologica, 73*(3), 129-134.
32
33   Birks, M., Francis, K., Learn, Bhsn, Nsg, Dhsc, Bed Nsg, G. D. E., Dne, D. R. M., . . . Rn, M.
34   N. (2009). Supporting the evolution of a research culture among nurses in Malaysia.
35   *Australian Journal of Advanced Nursing, 27*(1), 89-93.
36
37   Birks, M. J., Chapman, Y., & Francis, K. (2009). Women and nursing in Malaysia. *Journal of*
38   *Transcultural Nursing, 20*(1), 116-123.
39
40   Boltz, M. (2011). A system-level approach to improving the care of the older critical care
41   patient. *AACN Advanced Critical Care, 22*(2), 142-149.
42
43   Bouadma, Lila M. D., Mourvillier, Bruno M. D., Deiler, Veronique R. N., Le Corre, Bertrand
44   R. N., Lolom, Isabelle B. S., Regnier, Bernard M. D., . . . Lucet, Jean-Christophe M.
45   D. PhD. (2010). A multifaceted program to prevent ventilator-associated pneumonia:
46   Impact on compliance with preventive measures *Critical Care Medicine, 38*(3), 789-
47   796.
48
49   Cao, Y., DiGiacomo, M., Du, H. Y., & Davidson, P. M. (2009). Chinese nurses' perceptions
50   of heart health issues facing women in China: A focus group study. *Journal of*
51   *Cardiovascular Nursing, 24*(6), E23-E29.
52
53   Chang, Esther M, Hancock, Karen M, Johnson, Amanda, Daly, John, & Jackson, Debra.
54   (2005). Role stress in nurses: review of related factors and strategies for moving
55   forward. *Nursing & Health Sciences, 7*(1), 57-65.

20

Cooke, R.A., & Rousseau, D.M. (1988). Behavioral norms and expectations: A quantitative approach to the assessment of organizational culture. *Group and Organization Studies, 13*(3), 245-273.

Crumbley, David R., & Kane, Michele A. (2010). Development of an evidence-based pressure ulcer program at the National Naval Medical Center: Nurses' role in risk factor assessment, prevention, and intervention among young service members returning from OIF/OEF. *Nursing Clinics of North America, 45*(2), 153-168.

Downe-Wamboldt, Barbara. (1992). Content analysis: Method, applications, and issues. *Health Care for Women International, 13*(3), 313-321. doi: 10.1080/07399339209516006

Elo, Satu, & Kyngäs, Helvi. (2008). The qualitative content analysis process. *Journal of Advanced Nursing, 62*(1), 107-115. doi: 10.1111/j.1365-2648.2007.04569.x

Eman, S. M. Shahin, Theo, Dassen, & Ruud, J. G. Halfens. (2009). Pressure ulcer prevention in intensive care patients: Guidelines and practice. *Journal of Evaluation in Clinical Practice, 15*(2), 370-374.

Filippini, A., Sessa, A., Di Giuseppe, G., & Angelillo, I.F. (2011). Evidence-based practice among nurses in Italy. *Evaluation & the Health Professions, 34*(3), 371-382.

Fink, R., Thompson, C.J., & Bonnes, D. (2005). Overcoming barriers and promoting the use of research in practice. *Journal of Nursing Administration, 35*(3), 121-129.

Gerber, K. (2010). Surviving sepsis: A trust-wide approach. A multi-disciplinary team approach to implementing evidence-based guidelines. *Nursing in Critical Care, 15*(3), 141-151.

Goldstein, Karen M, Vogt, Dawne, Hamilton, Alison, Frayne, Susan M, Gierisch, Jennifer, Blakeney, Jill, . . . DiLeone, Brooke. (2018). *Practice-based research networks add value to evidence-based quality improvement.* Paper presented at the Healthcare.

Gould, Dinah, Moralejo, Donna, Drey, Nicholas, Chudleigh, Jane, & Taljaard, Monica. (2018). Interventions to improve hand hygiene compliance in patient care: Reflections on three systematic reviews for the Cochrane Collaboration 2007–2017. *Journal of Infection Prevention, 19*(3), 108-113.

Graves, N., Weinhold, D., Tong, E., Birrell, F. A., Doidge, S. R., Ramritu, P., . . . Whitby, M. (2010). The effect of healthcare-acquired infection on length of hospital stay and cost. *Infection Control and Hospital Epidemiology, 28*(3), 280-292.

Grimshaw, J., Eccles, M., Thomas, R., MacLennan, G., Ramsay, C., Fraser, C., & Vale, L. (2006). Toward evidence-based quality improvement: Evidence (and its limitations) of the effectiveness of guideline dissemination and implementation strategies 1966–1998. *Journal of General Internal Medicine, 21*(S2), S14-S20.

Grol, Richard. (1997). Personal paper: Beliefs and evidence in changing clinical practice. *British Medical Journal, 315*(7105), 418-421.

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Gunnarsdóttir, Sigrún, Clarke, Sean P., Rafferty, Anne Marie, & Nutbeam, Don. (2009). Front-line management, staffing and nurse-doctor relationships as predictors of nurse and patient outcomes. A survey of Icelandic hospital nurses. *International Journal of Nursing Studies, 46*(7), 920-927.

Halcomb, Elizabeth J, Gholizadeh, Leila, DiGiacomo, Michelle, Phillips, Jane, & Davidson, Patricia M. (2007). Literature review: Considerations in undertaking focus group research with culturally and linguistically diverse groups. *Journal of Clinical Nursing, 16*(6), 1000-1011.

Hsieh, Hsiu-Fang, & Shannon, Sarah E. (2005). Three approaches to qualitative content analysis. *Qualitative Health Research, 15*(9), 1277-1288. doi: 10.1177/1049732305276687

Institute of Medicine. (2010a). The future of nursing focus on education.   Retrieved 20 November, 2011, from http://www.iom.edu/~/media/Files/Report%20Files/2010/The-Future-of-Nursing/Nursing%20Education%202010%20Brief.pdf

Institute of Medicine. (2010b). The future of nursing leading change, advancing health. Retrieved 30 October, 2011, from http://www.iom.edu/~/media/Files/Report%20Files/2010/The-Future-of-Nursing/Future%20of%20Nursing%202010%20Report%20Brief.pdf

Kajermo, K. N., Boström, A. M., Thompson, D. S., Hutchinson, A. M., Estabrooks, C. A., & Wallin, L. (2010). The BARRIERS scale - The barriers to research utilization scale: A systematic review. *Implementation Science, 5*(1), 32-53.

Kenaszchuk, Chris. , Wilkins, Kathryn. , Reeves, Scott. , Zwarenstein, Merrick. , & Russell, Ann. . (2010). Nurse-physician relations and quality of nursing care: Findings from a national survey of nurses. *Canadian Journal of Nursing Research, 42*(2), 120-136.

Lai, N. M., Teng, C. L., & Lee, M. L. (2010). The place and barriers of evidence based practice: Knowledge and perceptions of medical, nursing and allied health practitioners in Malaysia. *BioMed Central Research Notes, 3*(1), 279-286.

Liu, Xu, Zheng, Jing, Liu, Ke, Baggs, Judith Gedney, Liu, Jiali, Wu, Yan, & You, Liming. (2018). Hospital nursing organizational factors, nursing care left undone, and nurse burnout as predictors of patient safety: A structural equation modeling analysis. *International Journal of Nursing Studies, 86*(2018), 82-89.

Macoby, Michael. (1994). Creating quality cultures in the east and west. *Research Technology Management, 37*(1), 57-59.

Malaysian Registry of Intensive Care. (2009). Malaysian Registry of Intensive Care (MRIC). Retrieved 17 March, 2010, from http://www.mric.org.my/Web/Page/index.aspx

Mathai, E., Allegranzi, B., Seto, W., Chraïti, M. N., Sax, H., Larson, E., & Pittet, D. (2010). Educating healthcare workers to optimal hand hygiene practices: Addressing the need. *Infection, 38*(5), 349-356.

Mermel, Leonard A , Allon, Michael, Bouza, Emilio, Craven, Donald E, Flynn, Patricia, O'Grady, Naomi P, . . . Warren, David K. (2009). Clinical practice guidelines for the

22

diagnosis and management of intravascular catheter-related infection: 2009 update by the Infectious Diseases Society of America. *Clinical Infectious Diseases, 49*(1), 1-45. doi: doi:10.1086/599376

National Pressure Ulcer Advisory Panel. (2007). Pressure ulcer stages revised by NPUAP: Update staging system.   Retrieved 6 August, 2009, from http://www.npuap.org/pr2.htm

Noble, Helen, & Smith, Joanna. (2015). Issues of validity and reliability in qualitative research. *Evidence-based nursing, 18*(2), 34-35.

Nyström, ME, Karltun, Johan, Keller, Christina, & Gäre, B Andersson. (2018). Collaborative and partnership research for improvement of health and social services: researcher's experiences from 20 projects. *Health research policy and systems, 16*(1), 46.

Papastavrou, Evridiki, Andreou, Panayiota, & Efstathiou, Georgios. (2014). Rationing of nursing care and nurse–patient outcomes: a systematic review of quantitative studies. *The International Journal of Health Planning and Management, 29*(1), 3-25.

Pronovost, P., & Sexton, B. (2005). Assessing safety culture: Guidelines and recommendations. *Quality and Safety in Health Care, 14*(4), 231-233. doi: 10.1136/qshc.2005.015180

Pronovost, Peter. (2008). Interventions to decrease catheter-related bloodstream infections in the ICU: The keystone intensive care unit project. *American Journal of Infection Control, 36*(10), S171.e171-S171.e175.

Pronovost, Peter J., Goeschel, Christine A., Colantuoni, Elizabeth, Watson, Sam, Lubomski, Lisa H., Berenholtz, Sean M., . . . Needham, Dale. (2010). Sustaining reductions in catheter related bloodstream infections in Michigan intensive care units: Observational study. *British Medical Journal (Clinical Research Edition), 340*, c309-c314. doi: 10.1136/bmj.c309

Rello, Jordi, Lode, Hartmut, Cornaglia, Giuseppe, & Masterton, Robert. (2010). A European care bundle for prevention of ventilator-associated pneumonia. *Intensive Care Medicine, 36*(5), 773-780.

Riordan, J., & Voegeli, D. (2009). Prevention and treatment of pressure ulcers. *British Journal of Nursing, 18*(20), S20-S27.

Roberts, S. J. (2000). Development of a positive professional identity: Liberating oneself from the oppressor within. *Advances in Nursing Science, 22*(4), 71-82.

Saarinen, K., & Aho, M. (2005). Does the implementation of a clinical information system decrease the time intensive care nurses spend on documentation of care? *Acta Anaesthesiologica Scandinavica, 49*(1), 62-65.

Sage, Lauren, & Harris, Janet. (2018). Nursing quality indicator outcomes in hospitals with a Clinical Nurse Leader: a scoping review protocol. *JBI Database of Systematic Reviews and Implementation Reports, 16*(4), 885-891. doi: 10.11124/jbisrir-2016-003330

23

Sawyer, Melinda M. , Weeks, Kristina., Goeschel, Christine A. , Thompson, David A. , Berenholtz, Sean M. , Marsteller, Jill A. , . . . Pronovost, Peter J. . (2010). Using evidence, rigorous measurement, and collaboration to eliminate central catheter-associated bloodstream infections. *Critical Care Medicine, 38* (8 Suppl), S292-S298.

Scott, Elaine S, & Miles, Jane. (2013). Advancing leadership capacity in nursing. *Nursing administration quarterly, 37*(1), 77-82.

Shortell, S.M., Zimmerman, J.E., Rousseau, D.M., Gillies, R.R., Wagner, D.P., Draper, E.A., . . . Duffy, J. (1994). The performance of intensive care units: does good management make a difference? *Medical Care*, 508-525.

Siu, H., Spence Laschinger, H.K., & Finegan, J. (2008). Nursing professional practice environments: Setting the stage for constructive conflict resolution and work effectiveness. *Journal of Nursing Administration, 38*(5), 250-257.

Soh, K.L., Davidson, P.M., Leslie, G., DiGiacomo, M., Rolley, J.X., Soh, K.G., & Rahman, A.A. (2011). Factors to drive clinical practice improvement in a Malaysian intensive care unit: Assessment of organizational readiness using a mixed method approach. *International Journal of Multiple Research Approaches, 5*(1), 104-121.

Soh, K.L., Davidson, P.M., Leslie, G., DiGiacomo, M., & Soh, K.G. (2013). Nurses' perceptions of standardised assessment and prevention of complications in an ICU. *Journal of Clinical Nursing, 22*(5-6), 856-865. doi: 10.1111/jocn.12017

Swierczek, Fredric William. (1994). Culture and conflict in joint ventures in Asia. *International Journal of Project Management, 12*(1), 39-47.

Tan, C. C., Zanariah, Y., Lim, K. I., & Balan, S. (2007). Central venous catheter-related blood stream infections: Incidence and an analysis of risk factors. *The Medical Journal of Malaysia, 62*(5), 370-374.

Tong, Allison, Sainsbury, Peter, & Craig, Jonathan. (2007). Consolidated criteria for reporting qualitative research (COREQ): A 32-item checklist for interviews and focus groups. *International Journal for Quality in Health Care, 19*(6), 349-357. doi: 10.1093/intqhc/mzm042

Tsai, Yafang. (2011). Relationship between organizational culture, leadership behavior and job satisfaction. *BMC health services research, 11*(1), 98-106.

Vila, Vanessa, Zhuang, Jiayuan, Tan, Elsie, & Thorne, Sally. (2018). Reflections on nursing educational advancement within diverse and evolving national cultural contexts. *International Journal of Nursing Education Scholarship, 15*(1). pp. -. Retrieved 13 Feb. 2019, from doi:10.1515/ijnes-2018-0017

Vivar, C. G. (2006). Putting conflict management into practice: A nursing case study. *Journal of Nursing Management, 14*(3), 201-206.

Vollman, Kathleen M. (2006). Ventilator-associated pneumonia and pressure ulcer prevention as targets for quality improvement in the ICU. *Critical Care Nursing Clinics of North America, 18*(4), 453-467.

24

Wallace, J., Nwosu, B., & Clarke, M. (2012). Barriers to the uptake of evidence from systematic reviews and meta-analyses: a systematic review of decision makers' perceptions. *BMJ open, 2*(5).

Williams, Marjory D, Sisk, Bryan W, Souter, Sharon S, Walker, Janice L, & Wolf, Linda F. (2019). Leadership Collaboration to Enhance Dissemination of Evidence-Based Nursing and Research Across Community Organization Boundaries.

Wong, L. P. (2008). Focus group discussion: A tool for health and medical research. *Singapore Medical Journal, 49*(3), 256-260.

Woo, Hongryun, & Heo, Nanseol. (2013). A content analysis of qualitative research in select ACA journals (2005–2010). *Counseling Outcome Research and Evaluation, 4*(1), 13-25. doi: 10.1177/2150137812472195

Zakuan, Z. D., Azian, H., Mahamarowi, O., & Md Radzi, J. (2009). The prevalence and risk factors of nosocomial acinetobacter blood stream infections in tertiary teaching hospital in North-Eastern Malaysia. *Tropical Biomedicine, 26*(2), 123-129.

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Table 1 Focus group participant characteristics

Characteristic (n=19)	n	%	Mean (SD)	Range
Age (Years)			32.47(4.91)	26 to 48 years
Length of service as a registered nurse (Years)			9.05(4.30)	4 month to 21 years
Length of service in ICU (Years)			5.33 (5.02)	1 month to 20 years
First nursing qualification				
3 years certificate	2	10.5		
3 years diploma	17	89.5		
Highest nursing qualification				
3 years diploma	9	47.4		
Post basic critical care	7	36.8		
Post basic infection control	1	10.5		
Bachelor degree	2	5.3		

Table 2 Themes and quotations from the focus groups

Themes	Subthemes	Illustrative quotes
Empowering staff to embrace evidence-based practices	Recognising PU and taking action	Nurse without any post basic critical care nursing qualification like me did not have any advancement in nursing…after we learned to assess for pressure ulcer we get the knowledge because we had been practicing the assessment….before this we did not able to recognized the first degree pressure ulcer. Now we can recognized and take the action immediately before it became worse. (Interview 4)
	Embedding change	You already give us one year time to practice. Earlier we felt difficult but now we felt like it (Waterlow assessment) is already inside us (doing well) we know what is in the assessment. Even we did not do (fill in the Waterlow form) the Waterlow. We know the patient is at risk such as age, skin type. Only we did not write down, no documentation. If we found patient with pressure sore we directly document in the report (nurse report) and do positioning. (Interview 1)
	Improving practice	Yes, there is improvement such as mouth toilet, hand washing for staff and visitors are improving a lot. Head of bed elevation we always remember to prop up the patients even without using the stick that you have provide to us. (Interview 4)
	Ongoing guidance	We need somebody that can guide us. When you are not around, The ward manager can take over. But sometimes if the ward manager not around who can we ask? (Interview 4)

Waterlow pressure ulcer is good. Need to be continued but need to be included in HIS (hospital information system). If still used paper it might be drop outs. If compulsory to do it we will do. I think if sister (ward manager) asks to do, they will also do it (nurse who refused to do Waterlow assessment). (Interview 2) |

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Staff knowledge, attitudes and beliefs that impact on behaviour	Lack of knowledge and training capacity i. IT system	When we started last year it is much better. [Implementation of Waterlow pressure ulcer assessment]This year when we start to implement the hospital information system everything was spoiled again, just like the beginning before you came. (Interview 3)
		Too busy with paperless. After we start using hospital information system in one to two month. We felt very headache using the computer. (Interview 5)
		Everything need to be covered from the observation chart, it sure take time for them and they don't know how to use computer possibly because they have never touch computer before but still they have no choice they still need to use. (Interview 3)
	ii. Clinical knowledge	From my understanding these nurses perceived that when the skin is tearing only they identify it as bed sore. (Interview 3)
		Some are still arguing with us, there was one child has a small redness on his skin. When we check their nursing care plan / nursing note no bed sore written. I'm not sure how they do their work. (Interview 3)
	Attitude toward documentations of PU assessment	Maybe nurses do not document[Waterlow assessment] because they feel it like unnecessary. I think laziness is the main reason of not doing it. (Interview 1)
	Ambivalence and resistance to change	...Waterlow, that is a new thing, but for her that is not a compulsory thing, she says oh this thing, (Waterlow pressure ulcer assessment) somebody wants to learn to do research. For her that thing is not important and not compulsory. (Interview 3)
		I mean like "ketuk paku dengan penukul"[Tap the nail with the hammer] not all nurses like that. Some of them but not many I also praise them because they know their work… (Interview 3)
	Beliefs regarding hierarchical status/positioning	They like to listen to the doctor…She think that she work under doctor even bedsore she expect doctor to check. Which one is doctor or nurse's job she also doesn't know how to differentiate. (Interview 3)
	Staff motivation (to persevere with systematic data collection)	When the change take longer time people became bored. That why if you see in one, two, or three months people get excited but after six month getting slower because people already know. (Interview 1)
	Standardised practices must be enforced by supervisors	I think factor that can help is the boss also helps to make the change successful, give the

Workplace culture: need for management-driven change to influence staff behaviour change		staff cooperation with the change. The boss needs to say and emphasis that the change needs to be done. (Interview 2)
	Consensus/unification regarding change. (Without consistent management/supervisor support and leadership, staff didn't engage/enact the change)	After we apply the hospital information system I'm just back from long sick leave. I admit that I did not monitor the progress of Waterlow implementation. Because I saw things look much better than before we implement the assessment, but apparently after we start the hospital information system they forget about the Waterlow assessment. (Interview 3)
		…Even we know the PU assessment is important for our patients care. But only we alone doing it and other people say no and the boss also did not emphasize that why some is doing it and some is not. (Interview 2)

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Phase 1: Assessment and consultation period		
Environmental scan	Nurse survey	Patient screening

Phase 2: Intervention
Development and implementation of multifaceted intervention
Nurse interviews

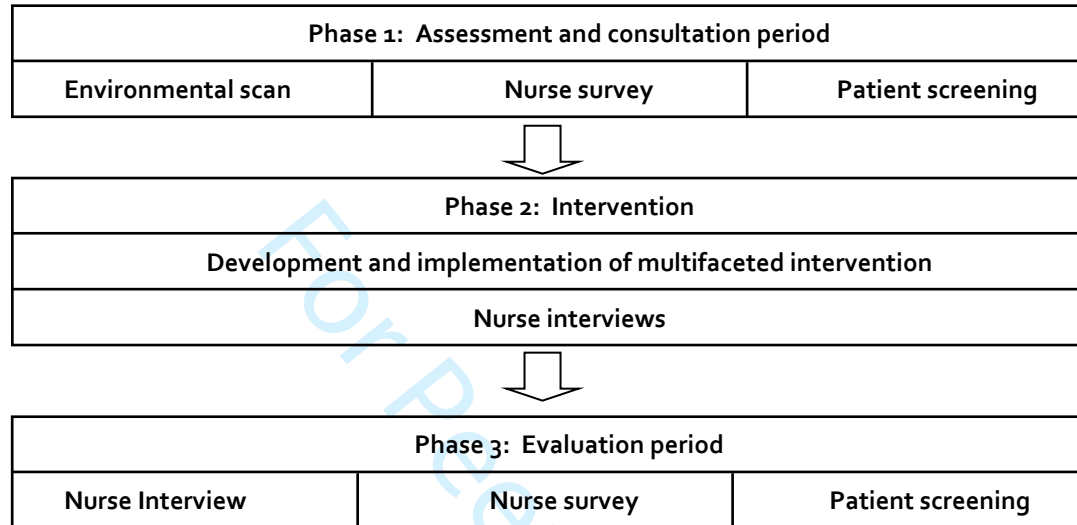| Phase 3: Evaluation period		
Nurse Interview	Nurse survey	Patient screening

Figure 1 Flowchart of overall action research activities and data collection process