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NURSES' AND JUNIOR DOCTORS' KNOWLEDGE, ATTITUDE AND PRACTICE IN RECOGNISING AND RESPONDING TO DETERIORATING PATIENTS IN THE EAST COAST MALAYSIA.

BY

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A thesis submitted in fulfilment of the requirement for the degree of Master in Nursing Science

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ABSTRACT

Nurses and junior doctors play an important role in providing care to patients. Therefore, their knowledge, attitudes and practice in assessing such patients are crucial to patient outcomes. Lately, concern about the incidence of deteriorating patients has increased, especially in the ward setting. In Malaysia Registry Intensive Care (MRIC) in 2013, 47.4% of Intensive Care Unit admissions were deteriorating patients transferred from medical wards. This research sought to determine nurses and junior doctors' knowledge, attitude and practice (KAP) in risk assessment and response to deteriorating patient and knowledge in emergency pharmacotherapy. Mixed method study approach was used. A cross-sectional survey among nurses and junior doctors in three Malaysian East Coast tertiary hospitals and analysis of patient's medical record from a medical ward at Hospital Tengku Ampuan Afzan. A simple random sampling without replacement method was used during survey and purposive sampling method for analysis of medical record. The data was analysed using SPSS 22.0 for descriptive and inferential analysis. Meanwhile, a framework analysis was used to analyse medical record analysis data. Total of 240 questionnaires was distributed and the study had a 79.5% (n=191) return rate for the cross-sectional survey. From that, 75.9% (n=145) were nurses and 24.1% (n=46) were junior doctors. Among participants, 3.1% (n=6) had adequate knowledge in risk assessment, 42.4% (n=81) had adequate knowledge in emergency pharmacotherapy and 55.0% (n=105) had adequate attitude and practice in risk assessment. Participant's age was associated with attitude (χ^2= 4.283; p=0.027) and practice (χ^2=8.726; p=0.002) in relation to recognizing deteriorating patient, and knowledge of emergency (χ^2=4.406; p= 0.003) pharmacotherapy. Three themes have been identified from analysis of medical records which were track and trigger, hierarchical intervening, and attitude. Nurses and junior doctors' knowledge in recognizing and emergency pharmacotherapy were inadequate; despite they were perceived that they had good attitude and practice in recognizing. There is a need for educational strategies, simulation and application of Early Warning Sign system to ensure that nurses and junior doctors have the commensurate level of theoretical and practice knowledge. Besides, Critical Care Outreach service should be introduced in Malaysian context to improve the care provided to patients.

خلاصة البحث

الممرضات والأطباء المبتدئين يلعبون دورا هاما في توفير الرعاية الصحية للمرضى. لذلك، فان مستوى المعرفة والسلوك والممارسة لديهم مهم جدا في تقييم حالة المريض. في الاونة الاخيرة، ازداد القلق إزاء تدهور الحالة الصحية للمرضى وخاصة في ردهات التحضير. في ماليزيا وخلال عام ٢٠١٣ كانت نسبة المرضى المنقولين من الاقسام الطبية الى وحدات العناية المركزة بحدود ٤٧,٤%. سعت هذه الدراسة الى تحديد مستوى المعرفة والسلوك والممارسة (KAP) لدى الممرضات والاطباء المبتدئين فيما يخص التقييم والاستجابة الى تدهور حالة المريض بالاضافة الى العلاج الدوائي لحالات الطوارئ. استخدمت هذه الدراسة طرق مختلطة لجمع البيانات. الاستبيان المستعرض بين الممرضات والاطباء المبتدئين في ثلاث مستشفيات في الساحل الشرقي من ماليزيا وتحليل سجلات المرضى في ردهات مستشفى تنكو امبوران افزان (HTAA). وتم استخدام العينة العشوائية البسيطة دون طريقة الاستبدال خلال المسح وطريقة العينة الهادفة لتحليل السجلات الطبية. وتم تحليل البيانات باستخدام التحليل الوصفي والاستنتاجي (SPSS 22). وفي الوقت نفسه ، تم استخدام التحليل الهيكلي لتحليل بيانات الوثائق.تم توزيع 240 استبيان , وكان معدل الاستجابة هو 79.5 ٪ (عدد 191) عن طريق الاستبيان المستعرض. من ذلك، كان 75.9٪ (عدد 145) من الممرضات وكان 24.1٪ (عدد 46) من الاطباء المبتدئين. من بين المشاركين، 3.1٪ (عدد 6) كان لديهم معرفة كافية في تقييم المخاطر، و 42.4٪ (عدد 81) كان لديهم معرفة كافية في العلاج الدوائي لحالات الطوارئ و 55٪ (عدد 105) كان لديهم موقف وممارسة كافية في تقييم المخاطر. الممرضات والاطباء المبتدئين لوحظ ان لديهم سلوك وممارسة جيدتين في تقييم حالات تدهور المريض ولكن خلال تحليل الوثائق كانت النتائج مختلفة. هناك علاقة بين عمر المشارك و السلوك ($\chi^2 = 4.283$؛ $P = 0.027$) والممارسة ($\chi^2 = 8.726$؛ $P = 0.002$) فيما يتعلق في تقييم حالة تدهور المريض ، والعلاج الدوائي لحالات الطوارئ ($\chi^2 = 4.406$؛ $P = 0.003$) . ثلاثة مواضيع تم تحديدها في هذه الدراسة و هي المسار والحافز , التدخل الهرمي والسلوك.كانت المعرفة في تقييم المخاطرو العلاج الدوائي لحالات الطوارئ لدى الممرضات والاطباء المبتدئين غير كافية على الرغم من ان لديهم سلوك وممارسة جيدتين في تقييم المخاطر. هناك حاجة لاستراتيجيات تعليمية والمحاكاة، وتطبيق نظام تسجيل الإنذار المبكر لضمان المستوى المناسب من المعرفة النظرية والعملية بين الممرضات والاطباء المبتدئين. الى جانب ذلك، ينبغي إدخال خدمه التوعية في العناية المركزه في السياق الماليزي لتحسين الرعاية المقدمة للمرضى.

APPROVAL PAGE

I certify that I have supervised and read this study and that in my opinion, it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a thesis for the degree of Master in Nursing Science

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DECLARATION

I hereby declare that this thesis is the result of my own investigations, except where otherwise stated. I also declare that it has not been previously or concurrently submitted as a whole for any other degrees at IIUM or other institutions.

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CHAPTER ONE

INTRODUCTION

1.1 INTRODUCTION

Patients' condition in the ward has been increasingly complex throughout the years. A study done by Che et al. (2014) found that 30% of patients admitted to the general ward have an unplanned transfer to ICU. Patients who experience clinical deterioration in the hospital ward have a significant burden of comorbidities and exhibit a high severity of illness at the time of ICU admission (Long et al., 2014). They also experience higher mortality rate (Hillman et al., 2002) and longer stay in ICU (Esminger et al., 2004). This finding was similar to a study done by Delgado et al. (2013) whereby they have found that higher mortality rate among those patient that have comorbidities.

The combination of multiple chronic diseases in patients has made the condition even more complex. The percentage of American adults aged over 65 with diabetes and hypertension was increased from 9% to 15% in 2009 to 2010 (Freid, Bernstein, & Bush, 2012). Patients with a more complex condition are more likely to further deteriorate during hospitalisation (Ansell, Meyer, & Thompson, 2015).

However, inpatients with no comorbidities can also experience deterioration. A study by Henriksen, Brabrand, & Lassen (2014) found that 31% of patients deteriorated within the first 24 hours of admission and their mortality rate was four times higher. Early detection of patient deterioration is to minimise morbidity and forestall serious complications. Previous study have shown that patient deterioration was not a sudden event but often the result of subtle changes during a time period of 8 to 24 hours in blood pressure, pulse rate, respiratory function, fluid, and acid-base

balance that remained undetected until culminating in a catastrophic collapse (Hravnak et al., 2008).

Other than comorbidities, 33.3% (N=3135) of inpatients from 23 cluster hospital in Australia have been reported to experience deterioration due to delayed treatment (Chen, Bellomo, Flabouris, Hillman, & Assareh, 2015). Delayed response causes poor prognosis to patient's condition. Focusing on early recognising the risks for deteriorating patients has been recognised as the potential way in ensuring patient's safety (Buykx et al., 2012). Therefore, a system called rapid response system was established to implement early recognition of patients at risk of deterioration and deteriorating patients (NICE, 2007).

Rapid response system identifies deterioration in patients prospectively and helps to alter their clinical trajectory through increasing the clinical resources directed towards them (Jones, DeVita, & Bellomo, 2011). As inpatients may show warning signs prior to deterioration (Kause et al., 2004), rapid response system has the potential to prevent adverse clinical outcomes, including cardiac arrest and death. These response systems are being utilised increasingly throughout the world, particularly in developed countries (Edelson, et al., 2014). By having rapid response system, it will improve nurse's moral, educate nurses and physicians, redistribute the workload and provide better care for patients (Benin, Borgstrom, Jenq, Roumanis, & Horwitz, 2012). Several terms have been used to refer to rapid response system which includes Critical Care Outreach (CCO), Medical Emergency Teams (MET), Medical Response Teams (MRT), and Rapid Response Teams (RRT) (Howell & Stevens, 2015). However, this service is still unavailable in Malaysia. In this study, the term critical care outreach is used to refer to rapid response system.

The main focus of this study is the ability of nurses and junior doctors in recognising (risk assessment) and responding to deteriorating patient. The study was conducted using mixed method approach. A survey of nurses and junior doctors who worked in the medical wards was done to determine their knowledge, attitude and practice (KAP) in recognising deteriorating patients. Medical record analysis using patient's medical records was done in order to identify the responses made by the nurses and junior doctors towards deteriorating patients. The survey part of the study was conducted at three tertiary hospitals in East Coast Malaysia and one tertiary hospital for the medical record analysis.

This thesis consists of six chapters. Firstly, chapter one focused on the background of the study. In chapter two, the researcher discussed articles and literature regarding the concept involved in recognising deteriorating patients and the proper response towards them. This is followed by chapter three, where the research methodology and approach used is explained. In Chapter four and five, the results of the study are presented and discussed in greater detail. In the last chapter, the researcher explained the limitations of the study and recommendations based on nursing education, practice and research area.

The following sections will include: background of the study, problem statement, and significance of the study, research questions, research objectives, and the null hypothesis of the study.

1.2 BACKGROUND

Nurses and doctors are the pillars in providing healthcare to patients. Their skills and knowledge are essential in ensuring a quality care for the patients especially in making patients feel safe and secure (Kvale & Bondevik, 2010). They are the first responders

towards deteriorating patients in the general ward (Chew, Mohd Idzwan, Nik Hisamuddin, Kamaruddin, & Wan Aasim, 2008). Patients' condition may deteriorate due to organ dysfunctions, comorbidities, history of organ failure and infections (Che et al., 2014).

However, researchers have found that nurses and junior doctors are lacking in term of knowledge in assessing patients for deterioration in the general ward (Ludikhuize, et al., 2012; Thomson, Luettel, Healey, Scobie, & Beaumont, 2007) and have insufficient skill to respond to deteriorating patients (Chew et al., 2008). They were also found to be not fully prepared in recognising (risk assessment) and to respond (providing treatment) to deteriorating patients (Smith, Perkins, Bullock, & Bion, 2007).

Deteriorating patients occur almost every day in the ward even though nurses and doctors are around them. Hospitalised patients often show declining vital sign up to 48 hours before deteriorating (Simmes, Schoonhoven, Mintjes, Fikkers, & van der Hoeven, 2012), but delayed action has lead patients to a more serious condition (Carberry & Headley, 2014; Mackintosh, Rainey, & Sandall, 2012). Therefore, risk assessment is important in ensuring patient's life and reduce patient's admission rate to the Intensive Care Unit (ICU) (Jones, Lippert, DeVita, & Hillman, 2014).

In risk assessment, appropriate tools are essential in maximising data collection. In Australia and the United Kingdom, Early Warning Sign (EWS) score system is widely used (Royal College of Physicians, 2012; National Institute for Health and Clinical Excellence [NICE], 2007) such as National Early Warning Score (NEWS) that has been develop by Royal College of Physicians (2012). In Malaysia, an early warning system tool has been developing by Ludin, Mohamad Ali, & Mohamad (2014) called Modified Early warning Score (MEWS). The EWS score

system is an effective assessment tool to identify patients at risk of deterioration and trigger a support team such as the outreach team (Nikki & Lowis, 2011). Simmes et al. (2012) has shown that a support team such as Rapid Response System (RRS) does help in reducing the rate of cardiac arrest event and unexpected death among hospitalised patients.

Critical Care Outreach Team (CCOT), Rapid Response Team (RRT) and Medical Emergency Team (MET) are examples of the common RRS in a healthcare setting. Generally, this team involves multidisciplinary critical care team who assist with identification and management of acutely ill patients on general wards, share critical care skills with ward staff and provide follow-up care to patients discharged from intensive care (Mackintosh, Rainey, & Sandall, 2012). The team has been introduced to facilitate effective 'rescue' of seriously ill patients in hospital wards (Calzavacca, et al., 2010; Mackintosh, Rainey & Sandall, 2012).

However, Malaysian healthcare setting does not have a RRS such as the CCOT. This has been the contributing factor that led to 24% of nurses failed to initiate an emergency response when patients deteriorate (Chew et al., 2008). Therefore, CCOT is needed in Malaysian healthcare setting.

1.3 PROBLEM STATEMENT

Recognising deteriorating patients are essential in ensuring patient's safety and quality of care. NICE (2007) has concluded that patients' conditions deteriorate due to the failure to observe, failure to recognise the early signs of deterioration, lack of communication concerning observations and failure to prioritise the specific treatments.

Failure to recognise the early sign of deterioration has been a global concern. Recognising a deteriorating patient is an essential nursing skill, and structured frameworks must be in place in order to have an effective patient assessment (Clarke, 2014) thus, making observation to be an important assessment (Mok, Wang, & Liaw, 2015). However, ineffective observation may hinder timely recognition of clinical deterioration leading to subsequent adverse events occurring in the general wards including mortality, unplanned ICU admissions, and cardiopulmonary arrests (Rose & Clerk, 2010), which made assessing patient's safety is as crucial.

The skills and knowledge of nurses and junior doctors have been recognised as one of the factors contributing to the failure of recognising and responding appropriately to clinical deterioration (Cameron, Millar, Szmidt, Hanlon, & Cleland, 2014; Konrad et al., 2010). Doctors and nurses who failed to stabilise the patients, which include securing the airway, breathing, and circulation, will negatively impact the patients' health status (Frost & Wise, 2012). Therefore, collaboration among nurses and junior doctors is said to be crucial in producing a better quality care and to minimise deterioration risk among patients in the ward.

Besides, medical error is also has been under-recognized as leading to patient death in many other countries, including the United Kingdom (Office for National Statistics 'Death Certification Advisory Group, 2010). Medical error has been defined as an unintended act (either of omission or commission) or one that does not achieve its intended outcome (Leape, 1994), the failure of a planned action to be completed as intended (an error of execution), the use of a wrong plan to achieve an aim (an error of planning) (Reason, 1990), or a deviation from the process of care that may or may not cause harm to the patient (Reason, 2001). Medical error has been the third leading cause of death in United State (Makary & Daniel, 2016). Study done by Landrigan,

Parry, Bones , Hackbarth, Goldman, & Sharek (2010) has estimated that 63% of adverse event was due to medical error.

Failure to prioritise the specific treatments and lack of communication concerning observations are factors that contributed to suboptimal care. Suboptimal care has become an international health issue and is correlated with patient's safety (World Health Organization, 2008). Lack of identification of deteriorating patients, late intervention and inept care for patient is defining characteristics of suboptimal care (Quirke, Coombs, & McEldowney, 2011).

Suboptimal care has been the contributory factor for inpatient's death (Davies, 2011). In the medical ward, patients deteriorate due to the suboptimal care that was given to them (Massey, Aitken, & Chaboyer, 2009), which can lead to unexpected death, unplanned admission to the ICU and cardiac arrest (Quirke et al, 2011). Patients that admitted with respiratory conditions, myocardial infarction, or sepsis are at diffidently increased risk for unplanned ICU transfer within 24 hours of admission to general ward (Delgado et al, 2013).

Other than suboptimal care, delayed in transferring deteriorating patients to the ICU had also given an impact to patient's outcome (Cardoso et al., 2011). For inpatient, the timing of transfer to ICU may be a crucial determinant of patient's outcome (Young, Gooder, McBride, James, & Fisher, 2003). The most important limiting factor in delayed admission is the lack of available ICU beds (Robert et al., 2012; Royal College of Anaesthetist, 2012). The demand for ICU beds was expected to increase due to the growth and aging of the population, increasing long-term survival of patients with chronic diseases associated with episodes of acute illness, and changing perceptions about the profile of patients likely to benefit from ICU admission (Rhodes , et al., 2012). Delayed transfer to ICU was not only happened to

medical ward but also occur for patient admitted from emergency department (Delgado et al., 2013). Other factors like the patient's age and underlying disease can also cause a delayed transfer to the ICU (Louriz et al., 2012).

However, delayed transfer to the ICU results in an increased morbidity; where it will increase the requirement of advanced respiratory support and duration of ventilation (O'Callaghan et al., 2012). Delays in receiving intensive care can result in longer lengths of stay in ICU, increased care requirements for the delayed patient and can result in delays to other patients requiring the same ICU resources (Chan, Farias, & Escobar, 2013). The results in study done by Cardoso et al. (2011) demonstrated an increased mortality rate when patient's admission and transfer to ICU was delayed. The relative risk of death increased 6% per hour of delayed transfer to the ICU (Duke, Green , & Briedis , 2004). While more recently study has found that each hour of waiting was independently associated with a 1.5% increased risk of ICU death (Cardoso et al., 2011).

In recent years, the acuity of patients who were managed on general wards has increased while access to critical care beds has decreased (Vincent & Rubenfeld, 2015). Acutely unwell patients may exhibit abnormal vital signs which are either not recognised or are treated inappropriately (Quirke, Coombs, & McEldowney, 2011). 60% of cardiac arrest is caused by insufficient knowledge in identifying deteriorating patients (Kause et al., 2004).

The biggest challenge to health professionals today is the need to provide a high-quality healthcare in a cost-effective manner (Chaboyer, Foster, Kendall, & James, 2004). Currently, healthcare field requires a massive amount of financial support especially those in a specialised area. Most of the budget in a hospital is allocated for medication and equipment, thus making the early recognition of

deterioration in patients being overlooked and become inconsistent (The National Confidential Enquiry into Patient Outcome and Death, 2005) hence, causing a more financial burden to the hospital and state.

Another alarming issue in the healthcare service is medication error. The Member States of the European Union consistently show that medication error occurs in 8 to 12% of patients during hospitalisation (World Health Organization, 2016). One of the medication errors is prescribing error that occurs in 11% of prescriptions (World Health Organization, 2016). In hospitals across Malaysia, 2,572 cases of medication errors were reported and it was identified as a main adverse issue that impacted patient outcomes in 2009 (Ahmad Fuad & Sarah Diyana , 2012; Merican, 2010).

However, to date, there is no formal policy or information on CCO in hospitals across Malaysia. Nurses' and doctors' knowledge on recognising deterioration in critically ill patients has never been assessed (Ludin et al., 2014) and there is not enough data to explain their response when dealing with deteriorating patients (Chew et al., 2008).

The questions that this study is trying to address are: What are the nurses' and junior doctors' knowledge, attitude and skills in recognising (risk assessment) and responding towards deteriorating patients? How much is their knowledge in pharmacotherapy? Can we entrust patients' life in their hands?

1.4 SIGNIFICANCE OF THE STUDY

Nurses and junior doctors are the first responders in the medical ward if patients are deteriorating. Therefore, this study is essential to identify nurses' and junior doctors' knowledge, attitude, and knowledge in emergency pharmacotherapy and in assessing

and responding towards deteriorating patients. This study has found that nurses and junior doctors have insufficient knowledge in recognising (risk assessment) deteriorating patients and emergency pharmacotherapy, even though they do have a good attitude and practice in patient care.

Through this study, a framework to educate nurses and junior doctors in recognising (risk assessment) and responding to deteriorating patients can be developed in ensuring patients' benefits in the future. They will also be able to evaluate themselves and improve their skills and knowledge in risk assessment and emergency pharmacotherapy of deteriorating patients. In addition, they also can improve their response towards these patients. From this study, the lack of track and trigger skills and medication prescribing error can be highly improved.

These findings also highlighted the need for development of the CCO in Malaysia. CCO is used widely especially in the United Kingdom or other similar service such as MET in Australia and RRT in United States (Royal College of Physicians, 2012; NICE, 2007). However, in Malaysia, there is no similar service that has been established (Ludin et al., 2014). Current study has established the preliminary data to evaluate the readiness of nurses and junior doctors in Malaysia toward the implementation of CCO.

Patient's outcome could be improved with the development of CCO which requires multi-discipline knowledge and skills in a healthcare provider. In addition, CCO may help in reducing the financial exhaustion in healthcare since patients' need for hospitalisation or admission to ICU may be reduced or better yet, prevented.

1.5 RESEARCH QUESTIONS

The questions that this study is trying to address are:

1. What are nurses' and junior doctors' knowledge, attitude and practice (KAP) in recognising (risk assessment) deteriorating patients in general medical wards?
2. What are nurses' and junior doctors' knowledge in emergency pharmacotherapy?
3. Is there any association between nurses' and junior doctors' demographic characteristics and their knowledge, attitude and practice (KAP) in recognising deteriorating patients in medical wards?
4. How do nurses' and junior doctors' respond to deteriorating events during their shift in medical wards?

1.6 RESEARCH OBJECTIVES

General objective is to determine the nurses' and junior doctors' knowledge of risk assessment and response towards deteriorating patients in the medical ward.

At the end of the study, this research will be able to:

1. Determine nurses and junior doctors' socio-demographic characteristics.
2. Determine nurses and junior doctors' knowledge, attitude and practice (KAP) in recognising (risk assessment) deteriorating patient in medical wards.
3. Determine nurses and junior doctors' knowledge in emergency pharmacotherapy
4. Determine the association between nurses' and junior doctors' socio-demographic characteristics and their knowledge, attitude and practice (KAP) in recognising (risk assessment) deteriorating patient in medical wards.
5. Explore the nurses' and junior doctors' responses to deteriorating events in medical wards.