Faculty of Medicine and Health Sciences

Early Mobility Practice in Selected Ministry of Health Intensive Care Units in Sarawak: Perceived Barriers and Facilitators of Early Mobility Protocol Adherence among Nurses

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DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Malaysia Sarawak. Except where due acknowledgements have been made, the work is that of the author alone. The thesis has not been accepted for any degree and is not concurrently submitted in candidature of any other degree.

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ABSTRACT

Early Mobility (EM) of patient during ICU stay is essential to enhance short-term functional outcomes, shorten duration on mechanical ventilation and hospital length of stay. Mobilising ICU patients remains a challenge evidenced by poor adoption of EM practice in ICU. Therefore, this study aimed to determine the prevalence of EM practice, adherence rate of EM protocol, perceived barriers to and facilitators of EM protocol adherence at the five government hospitals in Sarawak. A quantitative, cross-sectional study was conducted at Sarawak General Hospital, Sarikei, Sibu, Bintulu and Miri Hospital. A four-week audit was carried out to determine the prevalence and adherence rate of EM protocol in ICUs. The perceived barriers and facilitators of EM protocol adherence among the ICU staff nurses were determined by using self-administered questionnaire consisting of socio-demographic characteristics, perceived barriers and facilitators of EM protocol adherence. The prevalence of EM practice and adherence rate of EM protocol were calculated based on defined formulas. Descriptive statistics were used to characterise the samples and analyse the perceived barriers and facilitators of EM protocol adherence. Multiple linear regression (MLR) analysis was performed to identify the determinants of perceived barriers and facilitators of EM protocol adherence. During the four-week audit, a total of 1344 patient-days was audited for EM practice in the MOH ICUs Sarawak after excluding seven missing data. The prevalence of EM practice in the MOH ICUs Sarawak was 65.6% (n=882 patient-days). An average adherence rate of EM protocol was 52.5% among the five government ICUs in Sarawak. The greatest barrier to EM protocol adherence was behaviour-related barriers, which included inadequate staff (72.3%), and unavailability of necessarily equipment (70.3%); followed by attitude-related barriers, which comprised concern of health care provider's safety (50.9%), and patient's safety (50.3%). The top five perceived facilitators

identified were presence of a dedicated physiotherapist (96.8%), acquiring more equipment for EM and interdisciplinary teamwork (96.4%), skill training on EM (96.8%), education on EM and role clarity of each discipline (92.3%). The determinants of perceived barriers to EM protocol adherence were years of professional service and experience in ambulating patients with ETT in-situ. Those with one-year seniority in professional service had 0.02%, 0.01% and 0.14% lesser knowledge, attitude, and behaviour-related barriers scores, respectively. Those with experience in ambulating patients with ETT in-situ had 0.2 and 1.9% lesser knowledge and behaviour-related barriers score, respectively. Experience in ambulating patient with ETT in-situ (b = 0.1, 95% CI: 0.01, 0.25%) was the significant determinant of perceived facilitators of EM protocol adherence. This study provided preliminary data on the EM practice in the five government hospitals in Sarawak. The findings of this study indicated that the adoption of EM protocol remains a challenge in the Sarawak ICUs. The implementation of EM had to take in consideration of perceived barriers, facilitators and determinants identified in the local context. Reinventing ICU culture with multidisciplinary teamwork and collaboration to promote EM is key to address the barriers in EM implementation.

Keywords: Early mobility, barriers, facilitators, adherence

Amalan Mobiliti Awal di Unit Rawatan Rapi yang terpilih di Kementerian Kesihatan Malaysia, Sarawak: Persepsi Halangan dan Fasilitator dalam Keakuran terhadap Mobiliti Awal Protokol di kalangan Jururawat

ABSTRAK

Mobiliti awal (MA) bagi pesakit di Unit Rawatan Rapi (ICU) adalah penting untuk meningkatkan status fungsi otot berjangka pendek, memendekkan tempoh bantuan pernafasan secara mekanikal dan tempoh tinggal di hospital. MA merupakan satu cabaran yang dihadapi oleh profesional kesihatan dibuktikan dengan adapsi amalan MA yang lemah. Oleh itu, kajian ini bertujuan untuk menentukan kelaziman amalan MA, kadar pematuhan protokol MA, anggapan tentang halangan dan fasilitator dalam kepatuhan protokol MA di lima buah hospital kerajaan di Sarawak. Satu kajian berasaskan keratan rentas telah dijalankan di Hospital Umum Sarawak, Hospital Sarikei, Hospital Sibu, Hospital Bintulu and Hospital Miri. Empat minggu audit telah dijalankan untuk menentukan kelaziman dan kadar pematuhan protokol MA di ICU. Anggapan tentang halangan dan fasilitator dalam kepatuhan protokol MA di kalangan jururawat ICU teleh dikenalpasti dengan menggunakan soal selidik yang meliputi ciri-ciri sosial-demografi, anggapan tentang halangan dan fasilitator dalam kepatuhan protokol MA. Kelaziman amalan dan pematuhan protokol MA dikira berdasarkan formula yang ditakrifkan. Statisitk deskriptif digunakan untuk mengklasifikasikan sampel dan menganalisis anggapan tentang halangan dan fasilitator dalam kepatuhan protokol MA. Analisis Regresi Linear Pelbagai (RLP) telah dilakukan untuk mengenalpasti penentu anggapan tentang halangan dan fasilitator dalam kepatuhan protokol MA. Sejumlah 1344 pesakit-hari telah diaudit di ICU, Sarawak setelah tujuh data yang hilang dikecualikan. Kelaziman amalan MA di ICU kerajaan, Sarawak adalah 65.6% (n=882 pesakit-hari). Purata kepatuhan protokol MA adalah 52.5% di antara lima buah

ICU di Sarawak. Halangan utama dalam kepatuhan protokol MA adalah berkaitan dengan domain kelakuan, termasuk kekurangan kakitangan (72.5%), dan peralatan yang diperlukan (70.3%); diikuti dengan domain sikap, termasuk kerisauan tentang keselamatan kakitangan anggota kesihatan (50.9%) serta pesakit (50.5%). Lima anggapan fasilitator utama yang dikenalpasti adalah kehadiran fisioterapi yang berdedikasi (96.8%), memperoleh lebih banyak peralatan dan kerja berpasukan antara bidang (96.4%), latihan kemahiran (95.8%), pendidikan dan kejelasan peranan antara bidang (92.3%). RLP menunjukkan tahun dalam perkhidmatan profesional dan pengalaman dalam mobiliti pesakit yang mempunyai ETT merupakan penentu penting untuk anggapan halangan dalam MA. Mereka yang berpengalaman bekerja lebih satu tahun mempunyai 0.02%, 0.01% dan 0.14% kurang halangan MA bagi domain pengetahuan, sikap dan kelakuan. Pengalaman dalam mobiliti pesakit yang mempunyai ETT berhubungan dengan pengurangan 0.2 % dan 1.9% halangan bagi domain pengetahuan dan kelakuan masing-masing. Pengalaman dalam mobiliti pesakit yang mempunyai ETT (b = 0.1, 95% CI: 0.01, 0.25%) merupakan penentu utama untuk anggapan fasilitator dalam kepatuhan protokol MA. Kajian ini menyediakan data pendahuluan tentang amalan MA di ICU kerajaan, Sarawak. Penemuan kajian ini menunjukkan bahawa adapsi amalan MA merupakan satu cabaran di ICU dalam konteks Sarawak. Pelaksanaan MA perlu mengambil kira anggapan halangan, fasilitator dan penentu yang telah dikenalpasti dalam konteks tempatan. Penciptaaan semula budaya ICU dengan kerjasama pelbagai profesional yang mendorong amalan MA merupakan faktor utama untuk mengatasi halangan dalam pelaksanaan MA di ICU.

***Kata kunci*:** *Mobiliti awal, halangan, fasilitator, keakuran*

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ICU	Intensive Care Unit
MSIC	Malaysian Society of Intensive Care
MOH	Ministry of Health
EM	Early Mobility
SGH	Sarawak General Hospital

CHAPTER 1

INTRODUCTION

1.1 Introduction

This chapter provides an introduction for this study which consists of nine sections. Following the introduction section, background of the study, problem statement, research questions and objectives, research hypothesis, significance of the study, and operational definitions used in this study are presented respectively.

1.2 Background

Patients who require mechanical ventilation support are the major admission criteria in Intensive Care Unit (Hodgson, Berney, Harrold, Saxena & Bellomo, 2013; Hopkins, Spuhler & Thomsen, 2007). Each year, more than one million patients who require mechanical ventilation are admitted to Intensive Care Units (ICUs) in the United States (Perme & Chandrashekar, 2009). Approximately, 40% of adult patients in North America were mechanically ventilated while receiving treatment in ICU (Hopkins et al., 2007).

In Malaysia, the number of ICU admissions at the Ministry of Health (MOH) hospitals has increased over the years. This is evidenced by the increment of 16.8% (5703 cases) of total number of ICU admissions in the year 2015 (n=39595) as compared to the total number of ICU admissions in the year 2012 (n=33892) (Tong et al., 2014; Tong, Tai, Tan, Lim & Ismail, 2016). Among ICU admissions in MOH hospitals, 75% of the admissions involved invasive mechanical ventilation and 68% of the patients had one or multiple organ failures (Tong et al., 2016).

It is conventional to focus on hospital mortality or short-term physiologic end points as the outcome of patients requiring mechanical ventilation (Combes et al., 2003; Zilberberg & Epstein, 1998). Implementation of quality indicators and invention of new technologies in critical care area had contributed to the improvement of ICU patient survival rate in the last two decades (de Vos et al., 2010; Hodgson et al., 2013; Perme & Chandrashekar, 2009; Schweickert & Kress, 2011). Similarly, in Malaysia, the crude in-ICU mortality rate in the MOH ICUs has also decreased from 19.9% in the year 2013 (Tong et al., 2014) to 18.8% in the year 2015 (Tong et al., 2016).

A high proportion of ICU survivors suffer from significant physical disabilities, secondary to neuromuscular weakness from critical illness, prolonged bed rest, and immobility (Bailey et al., 2007; Burtin et al., 2009; Kress, 2009; Morris et al., 2008; Morris & Herridge, 2007; Perme & Chandrashekar, 2009). These do not include the physical disabilities due to the inflammation process of the diseases and the use of pharmacologic agents like corticosteroids, muscle relaxants, neuromuscular blockers, and antibiotics (Kress, 2009). Zink, Kollmar & Schwab (2009) reported that critical illness polyneuropathy (CIP) and critical illness myopathy (CIM) are two major complications in ICU patients which are severe and persistent, oftentimes leading to permanent disabilities (Kress, 2009).

Recently, a growing body of literature reported the benefits of early mobility (EM) in ICU patients. These findings changed the paradigm of old practice of complete bed rest in mechanically ventilated ICU patients (Schweickert & Kress, 2011). Newly published evidences indicate that EM in critically ill patients enhances short-term functional outcomes by optimising cardiopulmonary and neuromuscular status, as well as by maximising independent function (Burtin et al., 2009; Hodgson et al., 2013; Schweickert & Kress, 2011;

Schweickert et al., 2009; Tipping et al., 2016). As a result, the duration of mechanical ventilation and hospital length of stay were shortened (Burtin et al., 2009; Engel, Needham, Morris & Gropper, 2013; Morris et al., 2008).

The Malaysian Society of Intensive Care (MSIC) had adopted Morris et al. (2008)'s framework on mobility activity, and designed EM protocol for MOH ICUs in the second half of the year 2013. This protocol is considered as one of the quality improvement initiatives in ICU in order to improve patients' outcome upon ICU and hospital discharge. The protocol consists of four levels of physical activity. The progression from one level to another is based on the patient's consciousness level and functional ability. EM can be considered as a newly introduced quality improvement initiative in MOH ICUs as compared to Ventilator Care Bundle and Central Venous Catheter Care Bundle, which have been initiated since 2006 and 2008 respectively (Tong et al., 2014).

1.3 Statement of the problem

EM of patients during ICU stay is essential to enhance short-term functional outcomes, maximising independent function (Burtin et al., 2009), shorten duration of mechanical ventilation and hospital length of stay (Morris et al., 2008). Nevertheless, mobilising ICU patients is not being practised as frequently as expected (Barber et al., 2015). The challenge to mobilise patients attracts researchers' attention in various countries despite several prior publications which have reported the safety, feasibilities and benefits of EM on ICU patients (Bailey et al., 2007; Burtin et al., 2009; Kress, 2009; Morris et al., 2008).

A telephone survey across 500 ICUs in the United States that assessed the readiness of EM adoption and practice by Bahkru, Wiebe, McWilliams, Spuhler and Schweickert (2015) reported that the adoption of EM into practice was poor, which comprised only 30%.

Morris et al. (2008) also found that the delivery and administration of physical therapy is often infrequent and occurs irregularly despite it being a part of usual care.

Another two-day cross-sectional point prevalence study by Jolley et al. (2016), which was done in 17 out of 44 hospitals (39%) in the United States, to determine the prevalence and characters of mobility for ICU patients with respiratory failure reported that patients with respiratory failure received therapist-provided mobility on 32% (n=180) of patient-days, and patients on mechanical ventilation who achieved out-of-bed mobility was 16% (n=90) of patient-days. These findings were consistent with the adherence rate of EM protocol among 43 MOH ICUs, which varies from 28% to 100%, with a reported average of 74.5% in the year 2016 (Tai, Lim, Mohd Nor, Ismail & Wan Ismail, 2017). The adherence rate for Sarawak General Hospital (SGH), Sibu Hospital, Bintulu Hospital and Miri Hospital were 32.1%, 97.8%, 28.0% and 88.7% respectively. Notably, SGH and Bintulu Hospital were ranked the lowest adherence rate among 47 MOH ICUs (Tai et al., 2017).

Bridging the gap between evidence-based knowledge and actual clinical care remains a challenge. According to Cabana framework of behaviour change (Cabana et al., 1999), in order to adhere to new clinical guidelines, knowledge was the first affected domain, followed by attitude, and behaviour. Finding from systematic reviews on barriers to EM (Dubb et al., 2016; Parry et al., 2017) indicate that inadequate staff's knowledge about the benefits, safety, and techniques of mobility is a significant barrier for EM in ICU. Foong (2013) also reported a high proportion of ICU nurses at Hospital Raja Permaisuri Bainun in Ipoh felt that EM should only be initiated when patients were ready to be transferred out from the ICU although they knew the benefits of EM. Furthermore, Leong, Rasnah and Chong (2017)