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ORIGINAL ARTICLE

Prevalence and Outcomes of Night-Time Discharges from Intensive Care Unit of a Teaching Hospital

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ABSTRAK

Kajian prospektif ini menentukan prevalens discaj dari unit rawatan rapi (ICU) pada waktu malam, membandingkan kesan kepada pesakit apabila didiscaj dari ICU pada waktu malam serta waktu siang dan mengenal pasti faktor yang mempengaruhi kesan kepada pesakit. Kajian ini melibatkan pesakit yang didiscaj hidup dari ICU dan mengecualikan mereka yang dikeluarkan perintah jangan-resusitasi atau dimasukkan semula ke ICU selepas 72 jam setelah keluar dari ICU. Pesakit dikumpulkan ke dalam kumpulan discaj waktu malam yang berlaku di antara pukul 1700 dan 0759 keesokan harinya atau kumpulan discaj siang hari yang berlaku antara pukul 0800 dan 1659 pada hari yang sama. Kadar kemasukan semula ke ICU, tempoh tinggal di hospital melebihi 10 hari setelah discaj dari ICU, dan kadar kematian yang berlaku d hospital telah dibandingkan. Data 205 pesakit telah dianalisis dan 116 pesakit (56.6%) telah di discaj pada waktu malam. Kesan kepada pesakit adalah setanding apabila perbandingan dibuat antara waktu discaj dari ICU. Antara pesakit yang didiscaj pada waktu malam, kadar kemasukan semula terjejas dengan ketara oleh ketersediaan penjagaan susulan selepas ICU (p=0.002); kadar tempoh tinggal di hospital lebih dari 10 hari setelah discaj ICU terkesan secara ketara dengan keperluan mobilisasi katil untuk menampung kemasukan akut ICU (p=0.021); kadar kematian di hospital berkaitan secara ketara dengan sumber jangkitan yang tidak dikawal (p=0.004), keperluan untuk mobilisasi katil (p=0.001) dan ketersediaan penjagaan susulan selepas ICU (p=0.01). Kesimpulannya, masa discaj dari ICU tidak menjejaskan kesan kepada pesakit ketika berada di hospital.

Kata kunci: Discaj di waktu malam; hospital pengajar; kelaziman; unit rawatan intensif

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ABSTRACT

This prospective study determined the prevalence of night-time discharges from intensive care unit (ICU), compared the patient outcomes between night-time and daytime ICU discharges and identified factors affecting the patient outcomes. We included alive discharged ICU patients between 1st December 2020 to 31st October 2021 and excluded those who were issued do-not-resuscitate order or readmitted after 72 hours of ICU discharge. We grouped the patients into night-time discharges, which occurred between 1700 and 0759 the next day, or daytime discharges, which occurred between 0800 and 1659 of the same day. We analysed data of 205 patients which showed 116 patients (56.6%) we discharged at night-time. Patient outcomes were similar when we compared them with the timing of ICU discharges. Among the night-time discharges, the readmission rates were affected by the availability of post ICU follow up (p=0.002); the rates of hospital stays longer than 10 days after ICU discharge were affected by the need for bed mobilisation to accommodate acute ICU admission (p=0.021); the in-hospital mortality rates were affected by poorly controlled infection source (p=0.004), need for bed mobilisation (p=0.001) and availability of post ICU follow-up (p=0.01). In conclusion, the timing of ICU discharges did not affect the patient outcomes.

Keywords: Intensive care unit; night-time discharges; outcomes; prevalence; teaching hospital

INTRODUCTION

Management in intensive care unit (ICU) is vital when treating critically ill patients. However, the availability of ICU beds is limited. Despite increasing the availability of ICU beds, it remained inadequate as the demands for these beds were also increased (Hanane et al. 2008). As a result, there usually a need to discharge patients from ICU to accommodate any new admissions regardless of the time in the day, even though night-time discharges were considered as "premature" discharges (Bai et al. 2021; Goldfrad & Rowan 2000). Hence, there were concerns that patients discharged at night would have increased risks of in-hospital mortalities and readmissions into ICU in comparison to those discharged during the day.

Studies had defined night-time discharges differently (Duke et al. 2004; Goldfrad & Rowan 2000; Priestap & Martin 2006; Tobin & Santamaria. 2006; Uuraso et al. 2003). For example, Uuraso et al. (2003) defined "out of office" hours as times not within 0800 to 1600 whereas Tobin & Santamaria (2006) categorised the timing of discharges according to the nurses' shifts which night-time discharge occurred between 2200 to 0659 the following morning. Hence, there is no universal definition for

night-time discharges.

Few studies demonstrated the impact of ICU discharge during night-time on patient outcomes. These impacts were increased risks of ICU readmission, length of hospital stays and in-hospital mortality (Bristow et al. 2003; Duke et al. 2004; Goldfrad & Rowan 2000; Priestap & Martin 2006; Tobin & Santamaria. 2006). However, a study that was performed in Mayo Clinic showed no association between night-time ICU discharges and hospital mortality rates. Though, they detected among patients that were discharged during the night had higher ICU readmission rates and longer hospital length of stays (Hanane et al. 2008).

A retrospective study that was conducted in Brazil showed readmission to ICU was associated with increased risk of in-hospital death (OR, 4.103; 95% CI, 3.226-5.518; P<0.001; Ponzoni et al. 2017). However, when they performed a post hoc analysis on the same cohort of patients, they failed to show that the time of ICU discharge affected the rate of ICU readmissions (Corrêa et al. 2018; Ponzoni et al. 2017), which a study from Canada similarly reported (Azevedo et al. 2015).

A Canadian study suggested increased risk for in-hospital mortality when the ICU discharge was performed at night-time (Priestap & Martin 2006). In contrast, a study conducted in Finland, using their national ICU database, found ICU patients who were discharged in the evening and during night-time were not associated with increased risk of deaths (Uusaro et al. 2003). In view of variable patient outcomes revealed by numerous studies, as mentioned previously, we were interested to study our institution's prevalence of night-time and daytime ICU discharges, the effect of ICU discharge timings on patients' outcomes and factors affecting the outcomes of patients based on the time of ICU discharge.

MATERIALS AND METHODS

This was a prospective observational cohort study performed between 1st December 2020 to 31st October 2021 in general ICU of Hospital Canselor Tuanku Muhriz (HCTM). This study obtained ethics approval from the Research Ethics Committee, Universiti Kebangsaan Malaysia with research code FF-2020-390.

Study Population

Patients who were discharged alive from general ICU to ward/units during the study period were included into the study. The data from the first ICU admission was included for outcome analysis when any patients had multiple ICU admissions during the same hospitalisation. The exclusion criteria were patient who were admitted to COVID ICU, transferred to other hospital after discharge from ICU, readmission for lodging purposes, patient who transferred directly from ICU of another hospital, do-not-resuscitate (DNR) order issued after ICU discharge and ICU readmission occurs after 72 hours of ICU discharge.

We grouped the recruited patients according to the time when they were discharged from ICU. The attending

intensivist/anaesthesiologist decided for all of ICU admissions and discharges. Patients that were transferred out from ICU between 1700 and 0759 the next day were considered as night-time discharges, whereas ICU discharges between 0800 and 1659 of the same day were considered daytime ICU discharges. We chose these timings as it was our normal daily working hours in HCTM. During the daytime, the medical officers, specialists, and consultants in-charge were available from 0800 to 1700 while at night-time the ICU was managed by the on-call medical officers, specialist, and consultant from 1700 to 0800 the following day.

Data Collection

We collected patients' demographic data (age, gender), the number of co-morbidities the patients had, and the sources and diagnoses of ICU admissions. The diagnoses of ICU admissions were categorised according to the primary reasons for the patients' ICU admissions which were medical related infections (Medical-Infection), medical causes without infection (medical-non-infection), postoperatively (surgical-operative) or surgical causes that did not require surgical interventions (surgical-non-operative).

After the ICU discharges, patients from both groups were evaluated on their clinical outcomes. The patient outcomes that were recorded were readmission to ICU, hospital stay longer than 10 days after ICU discharge and in-hospital mortality. The possible factors that influenced the patient outcomes were also documented such as discharged with oxygen therapy and mode of oxygen delivery, discharged with inotropic support, the need of renal replacement therapy at ICU discharge, poor control of source of infection at ICU discharge, the need for ICU bed mobilisation to accommodate for acute ICU admission, and listed for post ICU follow-up.

During the study period, if any of the recruited data went missing, became incomplete or patient took 'At Own Risk' hospital discharge after ICU discharge, these data were excluded from the study analysis. The endpoints of the study were to find prevalence of night-time and daytime discharges from ICU, readmission rates to ICU, rates of length of hospital stays more than 10 days and in-hospital mortality rates following ICU discharge. Besides that, this study evaluated factors that affected the patient outcomes listed above following the ICU discharges. Flow chart of the study was shown in Figure 1.

Patient Outcome Definitions

Readmission to ICU was defined as ICU admission that occurred within the 72 hours following the initial discharge from ICU taking into consideration that this readmission might be related to the residual pre-existing critical illness rather than another separate incident (Kramer et al. 2012; Ponzoni et al. 2017). The mean length of stay in our ICU was 5.7 $\pm$ 8.4 days (Aung et al. 2020), thus, as the second patient outcome indicator, we recorded the

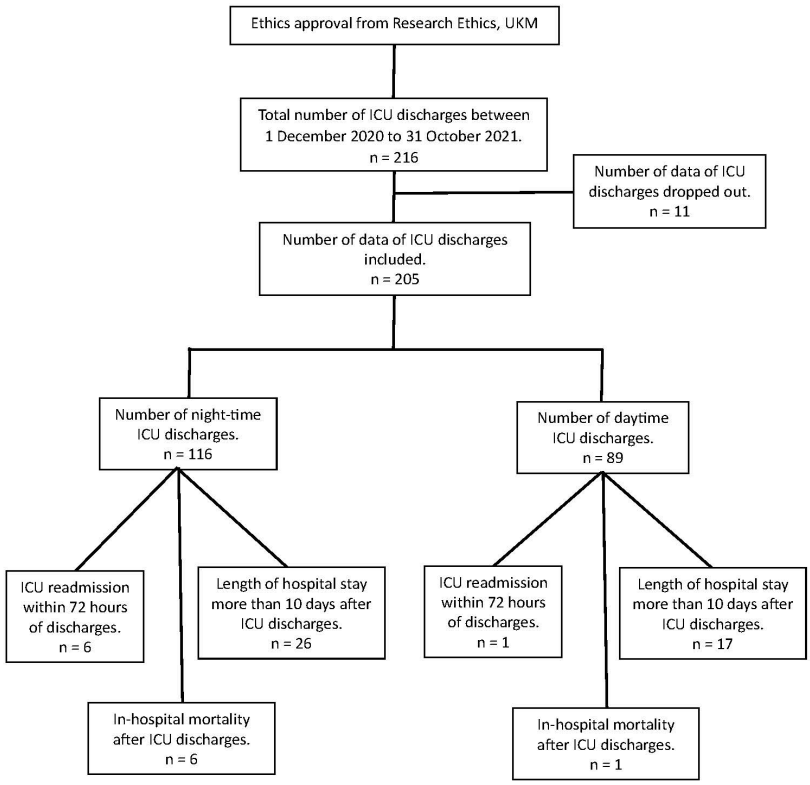

FIGURE 1: Overview of data collection process (UKM: Universiti Kebangsaan Malaysia; ICU: Intensive Care Unit)

number of patients that required to stay in the hospital double the length of time spent in ICU which was more than 10 days after ICU discharge. In-hospital mortalities were defined as any deaths that occurred after the first ICU discharge within the same hospital admission (Ponzoni et al. 2017).

Statistical Test

The calculation of the study sample size was based on Krejcie & Morgan (1970) formula for finite population where ICU patients were 191 during study period. Based on Hanane et al. (2008) study result regarding readmission rate following daytime discharges was 9% while the rate for night-time discharges was 12.2%. Therefore, we needed to recruit about 170 subjects as the minimum number of samples with 80% power of study, 95% confidence level and anticipation of 10% drop out rate. All data analyses were performed using SPSS for Windows version 25.0 (IBM Corp, Armonk, NY, USA). We presented the results as mean standard deviation, median (interquartile range) or frequency (percentages) as appropriate. For between-group analyses, independent t-test or Mann-Whitney U test was used for normally distributed continuous

data and not normally distributed data, respectively. The qualitative data analysis was done using Chi square test. A p value < 0.05 was considered as statistically significant.

RESULTS

A total of 216 patients were discharged from ICU during the study period. We excluded eleven patients as they were discharged with DNR orders. Therefore, 205 patients' data were analysed of which 116 patients (56.6%) were discharged from the ICU at night-time while 89 patients (43.4%) at daytime. There were no significant differences in patients' demographic characteristics, number of comorbidities and ICU admission source between night-time and daytime discharges except for patients' ICU diagnoses at admission to ICU as shown in Table 1. Post hoc analyses showed the discharges of patients who were admitted with "medical-infection" were mostly conducted at night-time (P = 0.000) while the discharges for postoperative patients mainly happened at daytime (P = 0.034).

TABLE 1: Comparison of demographic data, number of patients' comorbidities, ICU admission source and diagnosis of patients discharged from ICU. Values were expressed as numbers with percentages in parathesis

Parameters		Daytime discharge (n=89)	Night-time discharge (n=116)	P-value
Age	Below 20 years old	6 (6.7%)	5 (4.3%)	0.145
	21 to 30 years old	10 (11.2%)	4 (3.4%)	
	31 to 40 years old	8 (9.0%)	8 (6.9%)	
	41 to 50 years old	15 (16.9%)	18 (15.5%)	
	Above 50 years old	50 (56.2%)	81 (69.8%)	
Gender	Male	53 (59.6%)	69 (59.5%)	0.992
	Female	36 (40.4%)	47 (40.5%)	
Number of comorbidities	No comorbidity	21 (23.6%)	24 (20.7%)	0.920
	1 comorbidity	21 (23.6%)	27 (23.3%)	
	2 comorbidities	24 (27.0%)	36 (31.0%)	
	3 or more comorbidities	23 (25.8%)	29 (25.0 %)	
ICU admission source	Ward	27 (40.3%)	40 (59.7%)	0.695
	ED	34 (43.6%)	44 (56.4%)	
	Operation theatre	4 (66/7%)	2 (33.3%)	
	Critical area	24 (44.4%)	30 (55.6%)	
ICU admission diagnosis	Medical-Infection	8 (17.8%)	37 (82.2%)	<0.001*
	Medical-Non-infection	20 (48.8%)	21 (51.2%)	
	Surgical-Operative	50 (51.0%)	48 (49.0%)	
	Surgical-Non-operative	11 (52.4%)	10 (47.6%)	

ICU: Intensive Care Unit; ED: Emergency Department;
Post hoc analyses were performed on the ICU admission diagnoses using chi square statistical test.

Table 2 showed the comparison of patient outcomes between daytime and night-time discharges. There were no statistically significant differences between the patient outcomes when daytime and night-time discharges were compared. However, there were tendencies among patients that were discharged at night-time to readmit to ICU more, stay longer in the hospital for more than 10 days after ICU discharge and had higher in-hospital mortalities.

We investigated for the possible factors contributing to the patient outcomes of both night-time and daytime discharges as shown in Tables 3, 4 and 5. None of the ICU patients were discharged with haemodynamic supports. Patients that required readmission to ICU did not require renal replacement therapy at ICU discharge and the availability of post ICU follow-up significantly affected readmission to ICU among patients that were discharged at night-time as shown in Table 3. Table 4 showed the need for ICU bed mobilisation to accommodate for new ICU admission contributed significantly to patients that were discharged at night-time to stay in hospital longer than 10 days after ICU discharge. None of these discharged patients, who stayed in hospital longer that 10 days, was discharged from ICU with poor control of infection source. Patients that died in the hospital after ICU discharge were not transferred out from the ICU with tracheostomy in-situ. Among patients that were discharged at night-time from ICU, the in-hospital mortalities were significantly affected by poorly controlled source of infection at ICU discharge, the need for ICU bed mobilisation and availability of post ICU follow-up (Table 5).

TABLE 2: Comparison of patient outcomes between daytime and night-time ICU discharges. Values were expressed as numbers with percentages in parathesis

Patient outcomes	Daytime discharge (n=89)	Night-time discharge (n=116)	P-value
ICU readmission	1 (1.1%)	6 (5.2%)	0.141
Length of hospital stay more than 10 days after ICU discharge	17 (19.1%)	26 (22.4%)	0.564
In-hospital mortality	4 (4.5%)	9 (7.8%)	0.342

ICU: Intensive Care Unit

DISCUSSION

During the study period, we discharged patients more during the night-time and the timing of ICU discharges from our ICU did not affect the patient outcomes. However, there were tendencies among the patients that were discharged at night-time to have increased rates of ICU readmission, increased number of patients that had to stay in hospital for more than 10 days after ICU discharge and increased

TABLE 3: Factors affecting the readmission to ICU after discharge. Values were expressed as numbers with percentages in parathesis

Characteristic	Patients readmitted to ICU n = 7	Daytime discharge n=1	Night-time discharge n = 6	P-value
Discharged with O_2 therapy via nasal cannula	2 (28.6)	1 (100.0)	1 (16.7)	0.571
Discharged with O_2 therapy via venturi mask	3 (42.9)	0 (0.0)	3 (50.0)	1.000
Discharged with NIV	1 (14.3)	0 (0.0)	1 (16.7)	1.000
Discharged with tracheostomy	1 (14.3)	0 (0.0)	1 (16.7)	1.000
Discharged with poor control of source infection	1 (14.3)	0 (0.0)	1 (16.7)	0.067
Discharged for ICU bed mobilisation	1 (14.3)	0 (0.0)	1 (16.7)	1.000
Listed for post ICU follow-up	5 (71.4)	1 (100.0)	4 (66.7)	0.002*

O_2: Oxygen; NIV: Non-Invasive Ventilation; ICU: Intensive Care Unit

TABLE 4: Factors affecting hospital stay for more than 10 days after ICU discharge. Values were expressed as numbers with percentages in parathesis

Characteristic	Patients that stayed in hospital for more than 10 days n = 43	Daytime discharge n = 17	Night-time discharge n = 26	P-value
Discharged with O_2 therapy via nasal cannula	10 (23.3)	3 (17.6)	7 (26.9)	0.667
Discharged with O_2 therapy via venturi mask	16 (37.2)	6 (35.3)	10 (38.5)	1.000
Discharged with NIV	5 (11.6)	2 (11.8)	3 (11.5)	0.055
Discharged with tracheostomy	14 (32.6)	7 (41.2)	7 (26.9)	1.000
Discharged with renal replacement therapy	2 (4.7)	0 (0.0)	2 (7.7)	0.511
Discharged for ICU bed mobilisation	5 (11.6)	2 (11.8)	3 (11.5)	0.021*
Listed for post ICU follow-up	15 (34.9)	7 (41.2)	8 (30.8)	0.484

O_2: Oxygen; NIV: Non-Invasive Ventilation; ICU: Intensive Care Unit

TABLE 5: Factors affecting in-hospital mortality after ICU discharge. Values were expressed as numbers with percentages in parathesis

Characteristic	Patients that died in the hospital n = 7	Daytime discharge n = 1	Night-time discharge n = 6	P-value
Discharged with O_2 therapy via nasal cannula	2 (28.6)	1 (100.0)	1 (16.7)	0.571
Discharged with O_2 therapy via venturi mask	9 (69.2)	4 (100.0)	5 (55.6)	0.228
Discharged with NIV	4 (30.8)	0 (0.0)	4 (44.4)	0.228
Discharged with renal replacement therapy	1 (7.7)	0 (0.0)	1 (11.1)	1.000
Discharged with poor control of source infection	2 (15.4)	1 (25.0)	1 (11.1)	0.004*
Discharged for ICU bed mobilisation	4 (30.8)	0 (0.0)	4 (44.4)	0.001*
Listed for post ICU follow-up	6 (46.2)	0 (0.0)	6 (66.7)	0.010*

O_2: Oxygen; NIV: Non-Invasive Ventilation; ICU: Intensive Care Unit

rates of in-hospital mortalities. The increased risks for in-hospital mortalities were also seen in other studies that discharged their patients from ICUs at night-time (Jamaludin et al. 2021; Rodríguez-Carvajal et al. 2011; Yang et al. 2016). Recommendations were made to delay ICU discharge to reduce this risk (Bai et al. 2021; Daly et al. 2001; Rodríguez-Carvajal et al. 2011), however, it was difficult to implement this strategy during the study period, as like other healthcare services, we had to reduce the general ICU capacity to redirect our resources (equipment and manpower) to COVID ICU during the COVID 19 pandemic (Haileamlak 2021; Moynihan et al. 2021).

In addition to the recommendation above, there were other strategies recommended to minimise adverse outcomes associated with night-time discharges that included adequate staff at the disposition units, appropriate discharge criteria and recognising patients at risk prior to discharge (Azoulay et al. 2003; Bai et al. 2021 Duke et al. 2004; Priestap & Martin 2006). In exception of adequate staff at the disposition unit, the two other strategies were implemented in our ICU, hence, we did not detect any difference in patients' outcomes when timing of ICU discharges were compared. Nevertheless, when we looked closely at patients that required readmission in our study, they were among patients that were discharged from ICU at night-time which were listed on post ICU follow-up service. Thus, this service detected the clinical deterioration of these discharged patients in the wards, consequently, identified them still at risk even after ICU discharge (Jamaludin et al. 2021).

The present study had two patients, which was less than one percent of our study population, that was readmitted within 24 hours from ICU discharge. These readmissions could indicate inappropriate discharge decision. A few studies indicated that shorter duration from ICU discharge to readmission was likely due to the discharge decision (Chrusch et al. 2009; Duke et al. 2004; Jamaludin et al. 2021; Rowan et al. 1993). However, various indications might lead to ICU readmission such as reappearance of the initial problem, presence of a new problem, and the need for elective or emergency surgical procedure (Beck et al. 2002; Chrusch et al. 2009; Jamaludin et al. 2021; Smith et al. 1999). The first patient was elderly with three and more comorbidities who was admitted postoperatively. After 10 days of ICU stay, he was discharged to the ward with venturi mask. He was not followed up by the ICU team after discharge. The second patient was young who had brain malignancy. She was discharged with tracheostomy tube in-situ and listed for post ICU follow-up service. Both patients were discharged at night-time and readmitted after 6 hours and 15 hours, respectively. Although our study indicated the availability of post ICU follow-up increased readmission rates among ICU patients discharged at night-time, but these two cases demonstrated that reasons for ICU readmissions were multifactorial and were confounded by the complications of their initial problems for admission to ICU (Beck et al. 2002; Jamaludin et al. 2021).

Recoveries of our postoperative patients were more predictable which enabled the surgeons to prepare the disposition to surgical wards in advanced to the decision of ICU discharge by the attending intensivist/ anaesthesiologist, hence, we observed these group of patients mainly were discharged during the day (Bai et al. 2021; Narayan & Kashuk 2019). However, our ICU patients that were discharged at night-time were mostly among medical patients that were admitted with infections which their discharges were less foreseeable, consequently, the disposition medical wards were not prepared to receive these patients at the time when the decision for the ICU discharges were made (Plotnikoff et al. 2021). Furthermore, the unreadiness of these medical wards could be the result of high ward occupancy and lead to delayed ICU transfer which beds in the wards would only be available after hospital discharges were finalised, hence, ICU patients were transferred out at night-time when beds in wards were available (Chrusch et al. 2009; Ofoma et al. 2020). Of more concern, at night-time the on-call teams of these disposition wards were also managing few other units/ wards. Hence, patients with oxygen therapies or tracheostomy tube in-situ that may need regular oral or tracheal secretion suctioning and toileting, with inotropic support, and/or required regular/intermittent renal replacement therapies might overwhelmed these units' manpower and capabilities to care for these recently discharged ICU patients (Chrusch et al. 2009; Goldfrad & Rowan 2000; Ofoma et al. 2020;

Rowan et al. 1993).

The decision to discharge patients at night-time was not peculiar to our teaching hospital but more of a common predicament of many hospitals that had high demands for their ICUs beds with limited resources available (Goldfrad & Rowan 2000; Jamaludin et al. 2021; Rodríguez-Carvajal et al. 2011). In our ICU, when patients fulfilled the criteria for ICU discharge, regardless of time, patients were transferred out even at night-time instead of waiting for the next morning especially when these occupied beds were required for ICU bed mobilisation to accommodate other acute ICU admissions for other patients (Bai et al. 2021). However, when our ICU patients were transferred out to wards at night-time to allow for ICU bed mobilisation, they were observed to stay in the hospital longer than 10 days after ICU discharge. This finding implied that these patients required more time to be discharged safely to home despite being fit to transfer to ward from ICU. Transitioning from ICU to ward environment and facilities especially at night-time might had contributed to the longer stay in hospital after ICU discharge while many other factors, like patients' demographic and clinical characteristics, willingness and engagement of patients and families to the hospital discharge processes, affected the readiness of patients to return to the community which would directly impact the length of hospital stay (Plotnikoff et al. 2021).

Only selected few discharged ICU patients were listed by the attending intensivists/anaesthesiologists for post ICU follow-up. There could possibly be more patients that would benefit from review by the intensive care team after their discharge at their respective disposition units (Jamaludin et al. 2021). Nonetheless, post ICU follow-up was not a service that we provided to all patients that were discharged from general ICU in our centre. As showed by some studies, we plan to propose post ICU follow-up service or introduce the use of ICU step-down unit to our hospital management to improve patient safety and outcome particularly for high-risk patients (Jamaludin et al. 2021; Lekwijit et al. 2020; Villa et al. 2021).

The present study has several limitations. This prospective study was done during the COVID-19 pandemic in which our general ICU was converted into COVID ICU to accommodate for critically ill COVID-19 patients. Therefore, the number of general ICU beds had to be reduced as manpower and equipment for both ICUs were of the same pool. Consequently, we observed reduced admission rate for general ICU which directly resulted in reduced rate of discharges. Therefore, we had a smaller sample size than we anticipated which might affect the ability of this study to detect significant differences in patient outcomes. Furthermore, the specific causes of deaths and the quality of care provided in the disposition wards/units that might affect patients' outcomes were not investigated in our study.

CONCLUSION

During the study period, most of our

ICU discharges occurred at night, primarily involving medical patients admitted for infections. There was no difference in patient outcomes when comparisons were made between patients who were discharged from ICU during the daytime or the night-time. However, there were associated factors affecting patients' outcomes when ICU patients were discharged at night-time which were discharged with poorly controlled source of infection, discharged because of the need for ICU bed mobilisation and discharged with availability of post ICU follow-up.

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CONFLICT OF INTEREST

Authors declared no conflict of interest.

AUTHORS' CONTRIBUTION

Wan Mat WR: Principal author who contributed to conceptualisation, resources provision, the proposal writing, data collection, data analysis, reviewing and editing manuscript draft. Zaini SN: Author who contributed to conceptualisation, resources provision, the proposal writing, data collection, data analysis, reviewing and editing manuscript draft. Abd Rahman R, Md Nor N, Teo R: Authors who contributed to reviewing and editing manuscript draft.

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