Sleep Medicine

Original Article

Improved night shift schedule related to the mortality of critically ill patients with Corona Virus Disease 2019

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A B S T R A C T

Purpose: To determine the relationship between the improved night shift schedule and the mortality of critically ill patients with Corona Virus Disease 2019 (COVID-19).
Methods: According to the time of the implementation of the new night shift schedule, we divided all patients into two groups: initial period group and recent period group. The clinical electronic medical records, nursing records, laboratory findings, and radiological examinations for all patients with laboratory confirmed Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) infection were reviewed. Cox proportional hazard ratio (HR) models were used to determine the risk factors associated with in hospital death.
Results: A total of 75 patients were included in this study. Initial period group includes 45 patients and recent period group includes 30 patients. The difference in mortality between the two groups was significant, 77.8% and 36.7%, respectively. Leukocytosis at admission and admitted to hospital before the new night shift schedule were associated with increased odds of death.
Conclusions: Shift arrangement of medical staff are associated with the mortality of critically ill patients with COVID-19. The new night shift schedule might improve the continuity of treatment, thereby improving the overall quality of medical work and reducing the mortality of critically ill patients.

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1. Introduction

The outbreak of COVID-19 has lasted for several months and spread to the world, WHO had called it pandemic. Because COVID-19 is extremely infectious, and people still have little knowledge about the disease in the early stage of the epidemic, no effective measures have been taken to stop the spread of the virus, so a large number of people have been infected in a short period of time. Compared with a large number of patients, the number of medical staff is obviously insufficient, so they have to increase the number of shifts to deal with this situation. The overloaded work intensity has a strong impact on the physical and psychological health of medical staff. In addition, frequent shift work disrupts the continuity of treatment. It is reported that there are varying degrees of

psychological and sleep disorders in the frontline medical staff [1,2], but there are few reports on the impact of the night shift schedule of medical staff on medical treatment during the epidemic. This study compares the treatment of patients admitted before and after the night shift schedule changed, and explores the relationship between the improved night shift schedule and the mortality of critically ill patients with COVID-19.

2. Methods

2.1. Study design and participants

This single-center, retrospective, observational study was done at Wuhan Union Hospital (Wuhan, China). We retrospectively analyzed patients from Jan 24, 2020, to Mar 26, 2020, who had been diagnosed with COVID-19, according to WHO interim guidance [3]. We arrived in Wuhan on February 2, 2020 and started our support work. The initial night shift schedule was based on a four-day cycle, namely, working from 8 am to 4 pm on the first day, from 4 pm to

12 pm on the second day, from 12 pm to 8 am on the third day, and then taking another day off. All doctors were on duty in accordance with the above rules before the night shift schedule changed. We started implementing the new night shift schedule on Feb 10, 2020, for doctors who are skilled in emergency technique (endotracheal intubation, etc.) or doctors with extensive first aid experience, they only need to work during the day (from 9 am to 6 pm) instead of night shift. Meanwhile, the new night shift schedule of other doctors took a six-day cycle, working from 8 am to 2 pm on the first day, from 2 pm to 8 pm on the second day, from 8 pm to 12 pm on the third day, from 12 pm to 8 am on the fourth day, and then had two days off. The night shift schedule of nurses took a six-day cycle, working from 8 am to 2 pm on the first day, from 2 pm to 8 pm on the second day, from 8 pm to 12 pm on the third day, and from 12 pm to 8 am on the fourth day, and then had two days off. The nurse's night shift schedule had never been changed. So, we divided all patients into two groups: initial period group (admission before Feb 10, 2020) and recent period group (admission after Feb 10, 2020). Laboratory confirmation of SARS-CoV-2 infection was performed by the local health authority.

The Ethics Commission of the First Affiliated Hospital of Guangzhou Medical University approved this study (IRB:202051). Written informed consent was waived due to the rapid emergence of this infectious disease.

2.2. Data collection

We reviewed clinical electronic medical records, nursing records, laboratory findings, and radiological examinations for all patients with laboratory confirmed SARS-CoV-2 infection. The admission data of these patients were collected.

2.3. Outcomes

The primary outcome was the mortality from hospital admission to the cut off date. Since the Medical team of Guangzhou Medical University to assist Wuhan completed the mission and returned to Guangzhou on April 8, the cut-off date was Apr 7, 2020.

Sepsis and septic shock were defined according to the 2016 Third International Consensus Definition for Sepsis and Septic Shock [4]. Secondary infection was diagnosed when patients showed clinical symptoms or signs of pneumonia or bacteremia and a positive culture of a new pathogen was obtained from lower respiratory tract specimens (qualified sputum, endotracheal aspirate, or bronchoalveolar lavage fluid) or blood samples after admission [4]. Acute kidney injury was diagnosed according to the KDIGO clinical practice guidelines [5] and acute respiratory distress syndrome (ARDS) was diagnosed according to the Berlin Definition [6]. The illness severity of COVID-19 was defined according to the Chinese management guideline for COVID-19 (version 7.0) [7].

2.4. Statistical analysis

The purpose of this study is to explore the relationship between the improved night shift schedule and the mortality of critically ill patients with COVID-19. There were, therefore, no formal hypotheses being implemented to drive the sample size calculation and we included the maximum number of patients who met the inclusion criteria.

We expressed descriptive data as mean (SD) or median (IQR) for continuous variables and number (%) for categorical variables. We assessed differences between initial period and recent period using two-sample t test or Wilcoxon rank-sum test depending on parametric or nonparametric data for continuous variables and Fisher's exact test for categorical variables. Cox proportional hazard ratio (HR) models were used to determine HRs and 95% CIs between individual factors on mortality. Survival curves were developed using the Kaplan–Meier method with log-rank test. Time to events (death) were defined as the time from hospital admission to events.

Tests were two-sided with significance set at α less than 0.05. The SPSS 16.0 software (IBM SPSS) was applied for all analyses.

3. Results

A total of 75 patients were included in this study (Fig. 1). Among them, 45 cases were admitted before Feb 10, 2020 and 30 cases
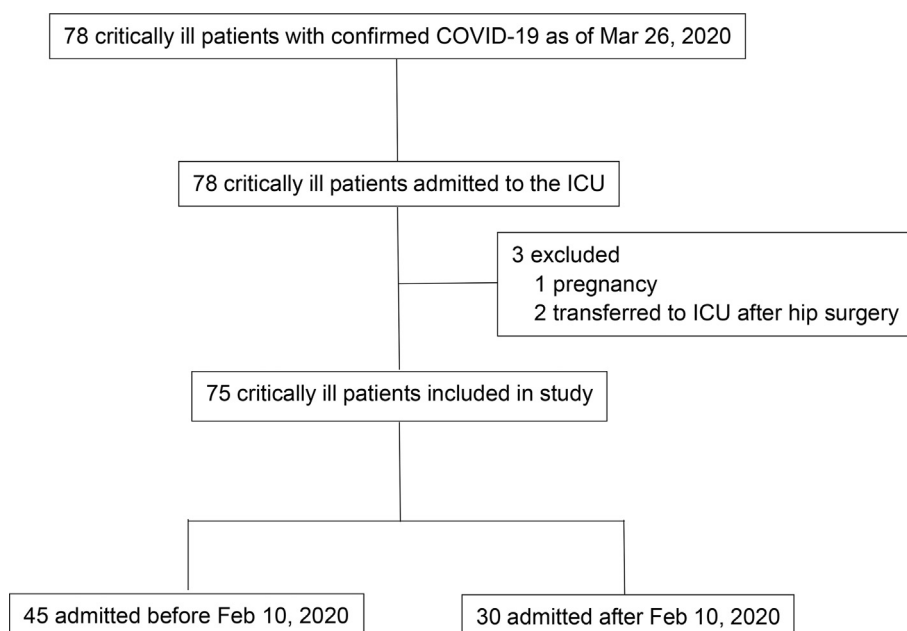

Fig. 1. Study flow diagram.

were admitted after Feb 10, 2020. The average age of all patients was 66 years (IQR 59–71), with 78.7% males (Table 1). There was no significant difference in age between the two groups. Nearly half (48%) of patients had hypertension, while 17.3% of patients had coronary heart disease. There was no significant difference in the prevalence of hypertension and coronary heart disease between the two groups (Table 1). In terms of laboratory findings, the level of hemoglobin, lactate dehydrogenase and high-sensitive cardiac troponin I of Initial period group were significantly higher than those of recent period group (Table 1). There was no significant difference in other laboratory findings between the two groups. All patients had bilateral infiltrates on chest X-ray. The most common symptoms were cough (70.7%), dyspnea (57.3%) and fatigue (54.7%). The oxygenation indexes of the two groups were 129.8 (SD 53.1) and 161.8 (SD 75.1), but the difference was not statistically significant. 71 (94.7%) patients received antibiotics and 63 (84%) received antivirals (Table 2). 63 (84%) patients were treated with high-flow nasal cannula, seven (9.3%) with extracorporeal membrane oxygenation (ECMO), 20 (26.7%) patients were treated with continuous renal replacement therapy. There was no significant difference in the proportion of invasive mechanical ventilation (IMV) and non-invasive mechanical ventilation (NIMV) between the two groups (Table 2).

21 patients (28%) were discharged before the cut off date. The difference in mortality between the two groups was significant, 77.8% and 36.7%, respectively. The number of patients in the two groups who were still in hospital before the deadline was 3 and 5 respectively. The median time of intensive care unit (ICU) length of stay was 9.5 days (IQR 6.0–15.8). There was no significant difference in ICU length of stay between the two groups (Table 2). The median time from illness onset to ICU admission was 20 days (IQR 13–29), the median time from illness onset to initiation of IMV was

Table 1
Demographic, clinical, laboratory, and radiographic findings of patients on admission.

	Initial period (n = 45)	Recent period (n = 30)	All patients (n = 75)	P value
Demographics and clinical characteristics				
Age, years	65 (60–70)	65.6 (13.9)	66 (59–71)	0.372
Sex				0.818
Male	35 (77.8%)	24 (80%)	59 (78.7%)	
Female	10 (22.2%)	6 (20%)	16 (21.3%)	
Chronic medical illness				
Hypertension	22 (48.9%)	14 (46.7%)	36 (48%)	0.850
Coronary heart disease	10 (22.2%)	3 (10%)	13 (17.3%)	0.171
Cerebrovascular disease	4 (8.9%)	4 (13.3%)	8 (10.7%)	0.819
Diabetes	10 (22.2%)	5 (16.7%)	15 (20%)	0.556
Chronic obstructive lung disease	2 (4.4%)	1 (3.3%)	3 (4%)	1
Chronic liver disease	1 (2.2%)	0	1 (1.3%)	1
Carcinoma	3 (6.7%)	2 (6.7%)	5 (6.7%)	1
Gastrointestinal ulcer	1 (2.2%)	0	1 (1.3%)	1
Current smoker	7 (15.6%)	4 (13.3%)	11 (14.7%)	1
Respiratory rate > 24 breaths per min	13 (28.9%)	14 (46.7%)	27 (36%)	0.116
Pulse ≥ 125 beats per min	2 (4.4%)	0	2 (2.7%)	0.514
Fever (temperature ≥ 37.3 °C)	17 (37.8%)	7 (23.3%)	24 (32%)	0.189
Cough	36 (80%)	17 (56.7%)	53 (70.7%)	0.03
Sputum	27 (60%)	10 (33.3%)	37 (49.3%)	0.024
Myalgia	10 (22.2%)	4 (13.3%)	14 (18.7%)	0.333
Fatigue	30 (66.7%)	11 (36.7%)	41 (54.7%)	0.011
Nausea or vomiting	1 (2.2%)	3 (10%)	4 (5.3%)	0.345
Pharyngalgia	3 (6.7%)	0	3 (4%)	0.4
Headache	3 (6.7%)	1 (3.3%)	4 (5.3%)	0.916
Dyspnea	28 (62.2%)	15 (50%)	43 (57.3%)	0.294
Nasal discharge	2 (4.4%)	0	2 (2.7%)	0.514
General malaise	14 (31.1%)	4 (13.3%)	18 (24%)	0.077
Diarrhea	2 (4.4%)	1 (3.3%)	3 (4%)	1
Oxygenation index	129.8 (53.1)	161.8 (75.1)	145.8 (66.1)	0.161
Laboratory findings				
White blood cell count, ×10^9 per L	8.1 (5.5–10.9)	8.8 (5.7–13.1)	8.2 (5.8–11.6)	0.503
Lymphocyte count, ×10^9 per L	0.6 (0.4–1.0)	0.6 (0.4–0.9)	0.6 (0.4–0.9)	0.837
Hemoglobin, g/dL	134.0 (124.5–150.0)	115.8 (26.3)	128.9 (23.3)	<0.001
Platelet count, ×10^9 per L	174.6 (79.0)	194.8 (88.1)	182.7 (82.8)	0.305
Albumin, g/L	28.5 (4.0)	29.5 (5.8)	28.8 (24.8–32.2)	0.677
ALT, U/L	37.0 (26.5–56.5)	36.0 (30.0–59.5)	37 (27–57)	0.829
Lactate dehydrogenase, U/L	548 (380–715)	381.0 (246.0–542.5)	472.0 (332.5–627.3)	0.010
Creatinine, μmol/l	73.8 (62.9–88.0)	76.9 (61.1–98.3)	74.6 (62.4–88.9)	0.869
CRP, mg/L	70.5 (34.6–115.7)	55.9 (31.4–109.7)	67.6 (33.8–111.2)	0.460
High-sensitive cardiac troponin I, ng/mL	30.7 (11.1–285.9)	9.0 (5.6–45.7)	17.5 (7.4–93.2)	0.010
Prothrombin time, s	14.2 (13.0–16.0)	14.0 (12.7–15.4)	14.2 (13.0–15.6)	0.408
D-dimer, μg/L				0.455
≤0.5	9 (20%)	4 (13.3%)	13 (17.3%)	
>0.5	36 (80%)	26 (86.7%)	62 (82.7%)	
Procalcitonin, ng/mL	0.2 (0.1–0.4)	0.2 (0.1–0.4)	0.2 (0.1–0.4)	0.661
BNP, pg/mL	91.1 (44.2–146.3)	99.8 (30.8–225.7)	93.4 (37.9–185.9)	0.956
Imaging features				
Bilateral pulmonary infiltration	45 (100%)	30 (100%)	75 (100%)	—

Data are mean (SD), median (IQR) or n (%). ALT, alanine aminotransferase; CRP, c-reactive protein; BNP, brain natriuretic peptide.

17.5 days (IQR 12.0–24.8), the median time from illness onset to initiation of NIMV was 13.5 days (IQR 10.8–19.3). The most common complications was secondary infection (57.3%). The frequency of acute kidney failure was higher in initial period group than recent period (Table 2).

In univariable analysis, odds of in-hospital death were higher in Initial period group (Table 3). Leukocytosis, high-sensitive cardiac troponin I and d-dimer were also associated with death (Table 3). In the multivariable Cox proportional hazard ratio models, we found that Leukocytosis at admission and admitted to hospital before the new night shift schedule were associated with increased odds of death (Table 3). For the primary outcome, among 75 critically ill patients with SARS-CoV-2 infection, 46 (61.3%) patients had died before the cut off date, and the median duration from hospital admission to death was 26.0 days (IQR 16.1–35.9) in Initial period group (Fig. 2).

4. Discussion

The results of this study show that the mortality before and after the implementation of the new night shift schedule was 77.8% and 33.3%, respectively, and the mortality of recent period group has dropped significantly. To our knowledge, this is the first study to explore the relationship between the improved night shift schedule and the mortality of critically ill patients with COVID-19.

In the early stage of the outbreak of COVID-19, due to the huge number of patients, medical institutions at all levels were overloaded, and the sleep time of medical staff could not be guaranteed.

At the same time, due to the unknown and highly infectious nature of SARS-CoV-2, the above two factors make the mental state of medical workers prone to problems. Previous studies reported that researchers used questionnaires to collect the "psychological stress" of medical staff and college students in various provinces in China during the epidemic, it was found that the "psychological stress" of first-line medical staff was significantly higher than that of college students [1]. Another study also showed that the somatization, depression, anxiety, and terror of first-line medical staff were more serious than the control group, and the sleep quality was also worse, the incidence of moderate and severe insomnia were 61.67% and 26.67%, respectively [2].

In order to ensure adequate rest for the medical staff who have mastered the core technology, we have implemented the new night shift schedule, that is, the skilled medical staff only need to go to the day shift, reducing or even canceling their night shift, thus ensuring their sleep time and mental state during the day work. It is reported that the quality of sleep of medical staff has an important impact on the daily clinical work [8,9]. A study of 289 night shift nurses showed that more than half (56%) of the nurses had sleep deprivation, and these nurses were more likely to make errors in nursing work [8]. A review also shows that sleep deprivation not only affects clinicians' memory, but also worsens clinicians' decision-making ability, concentration, and reaction time [9]. It is worth noting that sleep deprivation and frequent night shifts also increase the risk of medical staff contracting SARS-CoV-2 [10].

In addition, the new night shift schedule ensures the continuity of treatment. For patients with serious illness and rapid

Table 2
Treatments and outcomes.

	Initial period (n = 45)	Recent period (n = 30)	All patients (n = 75)	P value
Treatments				
Antibiotics	44 (97.8%)	27 (90%)	71 (94.7%)	0.345
Antiviral treatment	40 (88.9%)	23 (76.7%)	63 (84%)	0.274
Corticosteroids	39 (86.7%)	21 (70%)	60 (80%)	0.077
Intravenous immunoglobin	33 (73.3%)	20 (66.7%)	53 (70.7%)	0.534
High-flow nasal cannula oxygen therapy	39 (86.7%)	24 (80%)	63 (84%)	0.653
Invasive mechanical ventilation	44 (97.8%)	25 (83.3%)	69 (92%)	0.068
Non-invasive mechanical ventilation	25 (55.6%)	12 (40%)	42 (56%)	0.187
ECMO	3 (6.7%)	4 (13.3%)	7 (9.3%)	0.571
CRRT	15 (33.3%)	5 (16.7%)	20 (26.7%)	0.110
Prognosis				
Discharge from hospital	7 (15.6%)	14 (46.7%)	21 (28%)	0.003
Death	35 (77.8%)	11 (36.7%)	46 (61.3%)	<0.001
Remained in hospital	3 (6.7%)	5 (16.7%)	8 (10.7%)	0.321
Outcome				
ICU length of stay, days	9 (6–15)	12.0 (4.5–17.5)	9.5 (6.0–15.8)	0.791
Time from illness onset to ICU admission, days	18 (12–27)	25.7 (14.8)	20 (13–29)	0.081
Time from illness onset to initiation of IMV, days	18 (12–23)	17.0 (11.5–30.5)	17.5 (12.0–24.8)	0.960
Time from illness onset to initiation of NIMV, days	14.0 (11.5–21.5)	13.5 (8.6)	13.5 (10.8–19.3)	0.270
Complications				
Septic shock	8 (17.8%)	6 (20%)	14 (18.7%)	0.809
Secondary infection	28 (62.2%)	15 (50%)	43 (57.3%)	0.294
Acute kidney failure	14 (31.1%)	2 (6.7%)	16 (21.3%)	0.011
DIC	3 (6.7%)	2 (6.7%)	5 (6.7%)	1
pneumothorax	10 (22.2%)	4 (13.3%)	14 (18.7%)	0.333
Stress ulcer	2 (4.4%)	2 (6.7%)	4 (5.3%)	1
ARDS	8 (17.8%)	3 (10%)	11 (14.7%)	0.549
DVT	2 (4.4%)	1 (3.3%)	3 (4%)	1
Respiratory failure	14 (31.1%)	8 (26.7%)	22 (29.3%)	0.679
Sepsis	9 (20%)	7 (23.3%)	16 (21.3%)	0.730
Acidosis	5 (11.1%)	0	5 (6.7%)	0.156
Viral myocarditis	5 (11.1%)	0	5 (6.7%)	0.156
Hypoproteinemia	7 (15.6%)	2 (6.7%)	9 (12%)	0.425

Data are mean (SD), median (IQR) or n (%). ECMO, extracorporeal membrane oxygenation; CRRT, continuous renal replacement therapy; ICU, intensive care unit; IMV, invasive mechanical ventilation; NIMV, non-invasive mechanical ventilation; DIC, disseminated intravascular coagulation; ARDS, acute respiratory distress syndrome; DVT, deep venous thrombosis.

Table 3
Risk factors associated with in-hospital death.

	Univariable HR (95% CI)	P value	Multivariable HR (95% CI)	P value
Demographics and clinical characteristics				
Age, years				
<65	1 (ref)	–		
≥65	1.56 (0.86–2.82)	0.145		
Male sex (vs female)	1.17 (0.57–2.44)	0.669		
Current smoker (vs nonsmoker)	1.76 (0.83–3.71)	0.139		
Comorbidity present (vs not present)	1.06 (0.56–2.01)	0.862		
Chronic obstructive pulmonary disease	2.85 (0.87–9.31)	0.084		
Coronary heart disease	0.85 (0.40–1.83)	0.682		
Diabetes	1.23 (0.59–2.56)	0.581		
Hypertension	1.36 (0.75–2.45)	0.310		
Laboratory findings				
White blood cell count, $\times 10^9$ per L				
<4	0.46 (0.11–1.95)	0.288	0.61 (0.08–4.84)	0.637
4–10	1 (ref)	–	1 (ref)	
>10	1.95 (1.07–3.53)	0.028	2.29 (1.10–4.78)	0.027
Lymphocyte count, $\times 10^9$ per L				
<0.8	1.53 (0.76–3.10)	0.233		
0.8–3.5	1 (ref)	–		
>3.5	5.28 (0.65–42.66)	0.118		
Platelet count, $\times 10^9$ per L				
<100	1.36 (0.65–2.83)	0.416		
100–300	1 (ref)	–		
>300	0.96 (0.29–3.13)	0.943		
AST, U/L				
≤40	1 (ref)	–		
>40	1.26 (0.69–2.30)	0.452		
ALT, U/L				
≤40	1 (ref)	–		
>40	0.87 (0.48–1.55)	0.628		
Creatinine, μmol/l				
≤133	1 (ref)	–		
>133	0.39 (0.05–2.82)	0.350		
Lactate dehydrogenase, U/L				
≤245	1 (ref)	–		
>245	1.89 (0.59–6.11)	0.287		
High-sensitive cardiac troponin I, ng/mL				
≤28	1 (ref)	–	1 (ref)	
>28	2.06 (1.06–4.01)	0.033	1.48 (0.72–3.05)	0.287
Prothrombin time, s				
≤16	1 (ref)	–		
>16	1.87 (0.94–3.71)	0.075		
D-dimer, μg/L				
≤0.5	1 (ref)	–	1 (ref)	–
>0.5	2.88 (1.12–7.42)	0.029	1.73 (0.59–5.13)	0.321
Procalcitonin, ng/mL				
≤0.5	1 (ref)	–		
>0.5	1.60 (0.70–3.66)	0.266		
Others				
IMV (vs NIMV only)	3.41 (0.82–14.16)	0.092		
NIMV (vs without NIMV)	1.33 (0.74–2.39)	0.345		
Period of hospital admission				
Recent period	1 (ref)	–	1 (ref)	–
Initial period	2.42 (1.23–4.77)	0.011	2.85 (1.29–6.29)	0.010

CI, confidence interval; HR, hazard ratio; AST, aspartate aminotransferase; ALT, alanine aminotransferase; IMV, invasive mechanical ventilation; NIMV, non-invasive mechanical ventilation.

progress, medical staff need to pay close attention to prepare for emergency events. Before the implementation of the new night shift schedule, medical staff would work in three shifts or even four shifts per day. Unstable working hours and changes in sleep rhythm prevented doctors who knew the condition of these patients from maintaining relatively continuous medical care. After the implementation of the new night shift schedule, these doctors only need to go to the day shift, and their working hours have been greatly extended, while ensuring sufficient sleep time, thereby improving the quality of clinical work.

Consistent with the results of our study, many articles reported that severe COVID-19 patients had leukocytosis, and leukocytosis is associated with patients' poor prognosis [11–14]. In this study, the increase in D-dimer and high-sensitive cardiac troponin I was associated with poor prognosis, reflecting the direct effect of patients' coagulation function and cardiac dysfunction on mortality, consistent with previous reports [13,15].

This study has several limitations. First, we did not evaluate the mental health status and sleep quality of medical staff, however, according to the frontline medical staff's self-prosecution, their
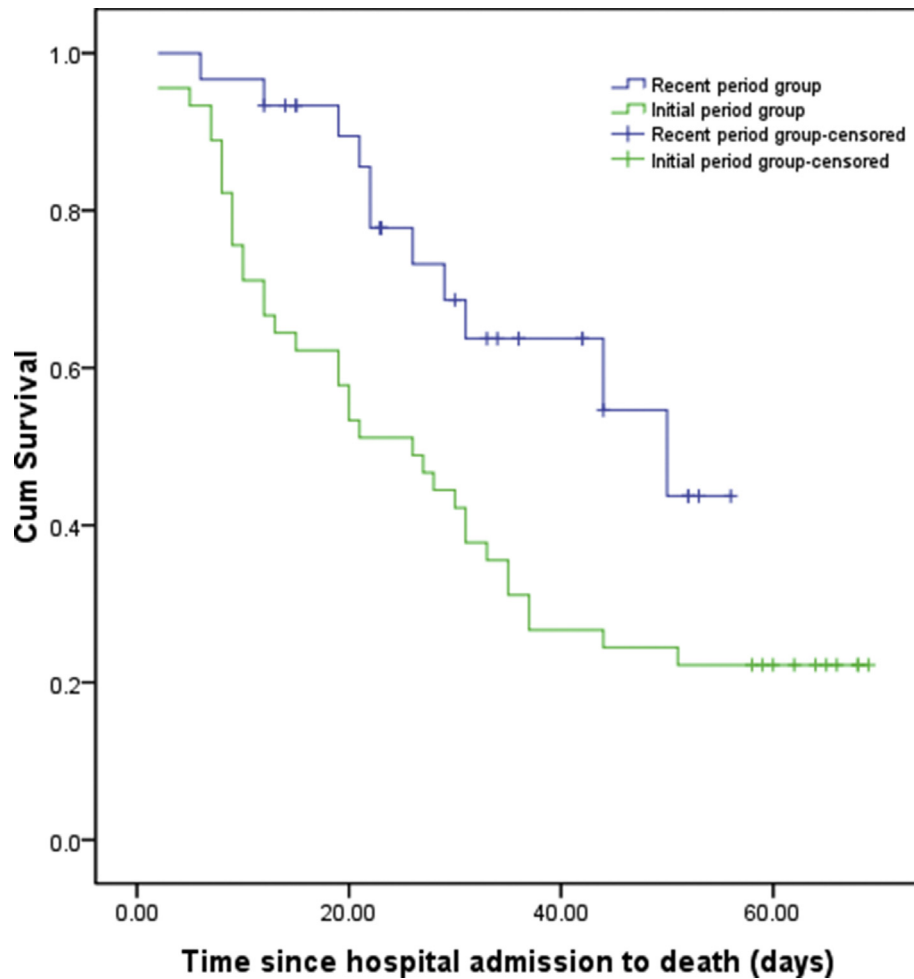
Fig. 2. Survival of critically ill patients with COVID-19.

mental state has been greatly improved after the night shift schedule was changed. Secondly, since this study is a retrospective study, we cannot collect this information of sequential organ failure assessment (SOFA) score and acute physiology and chronic health evaluation II (APACHE II) score.

5. Conclusions

In conclusion, shift arrangement of medical staff is associated with the mortality of critically ill patients with COVID-19. The new night shift schedule might improve the continuity of treatment, thereby improving the overall quality of medical work and reducing the mortality of critically ill patients.

CRediT authorship contribution statement

Sun Zhang: Methodology, Software, Writing - original draft. **Yuanda Xu:** Conceptualization, Methodology. **Kang Wu:** Formal analysis. **Tao Wang:** Formal analysis. **Xiaofen Su:** Investigation. **Qian Han:** Methodology. **Yin Xi:** Investigation, Resources. **Shitao Zhu:** Data curation, Resources. **Yong Gao:** Resources. **Hongbo Wang:** Data curation. **Yu Hu:** Resources. **Chunli Liu:** Visualization, Conceptualization. **Nanshan Zhong:** Project administration. **Pixin Ran:** Supervision. **Nuofu Zhang:** Writing - review & editing.

Abbreviations list

COVID-19 Corona Virus Disease 2019
SARS-CoV-2 Severe Acute Respiratory Syndrome Coronavirus 2
IRB   institutional review board
ALT   alanine aminotransferase
AST   aspartate aminotransferase
CRP   c-reactive protein
BNP   brain natriuretic peptide
DIC   disseminated intravascular coagulation
ARDS   acute respiratory distress syndrome
DVT   deep venous thrombosis
ECMO   extracorporeal membrane oxygenation
CRRT   continuous renal replacement therapy
IMV   invasive mechanical ventilation
NIMV   non-invasive mechanical ventilation
ICU   intensive care unit

SOFA   sequential organ failure assessment
APACHE II   acute physiology and chronic health evaluation II
SD   standard deviation
IQR   interquartile range
CI   confidence interval
HR   hazard ratio

Conflict of interest

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

The ICMJE Uniform Disclosure Form for Potential Conflicts of Interest associated with this article can be viewed by clicking on the following link: https://doi.org/10.1016/j.sleep.2020.08.010.

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