

## Effect of Integration of Palliative Care and Critical Care in ICU of a Tertiary Health Care Centre

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### Abstract

**Aim:** To observe and study the effects of integration of palliative care with critical care in ICU of a tertiary health care centre. **Material and Methods:** A retrospective study was performed between January 2019 to December 2019 at JK Hospital & LN Medical College, Bhopal, M.P. Patients characteristics were analyzed and then we studied the effects of integration by triaging the patients according to ECOG-PS. **Results:** The mean age of patients admitted in ICU was 57 years with neurological cause(45.39%) i.e. acute stroke as primary reason for ICU admission (26.47%) along with mortality rate of 11.82% and most common cause of mortality as MODS(44%). It was found that a major part of patients who are terminally ill admitting to the ICU needs palliative care rather than aggressive critical care. Moreover, it was observed that at terminal stage of life in terminally ill patients, families preferred a peaceful death at home than at a hospital. **Conclusion:** Mortality rate is seen higher in age group >65 years with more than one organ failure. In these patients palliative care dominates over curative care. Segregation of these patients for palliative care showed better utilization of scarce medical resources and enhanced treatment decision making for the patients who required curative care and avoidable less financial burden on patients resources and ensuring a good death for the patients who require palliative care at terminal stage of illness.

**Keywords:** ICU, demographic, palliative care, terminal illness, critical care.

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### Introduction

Intensive care unit specializes in treating patients with critical illness requiring closed supervision with constant care. The status of intensive care unit is emerging but it is an expensive and limited resource. In the recent times of growing demands strategies regarding level of care need to be organized into patients in need of aggressive critical care and those needing palliative care. It is common observation that in our country, in terminally ill patients during end of life care futile interventions is a usual practice. The 2015 Quality of Death Index ranking palliative care across the world has ranked India at 67<sup>th</sup> among the eighty countries studied. According to this report, poor quality of end-of-life care delivery in India is secondary to poor government-led strategy toward national-level palliative care, lack of training of health professionals in palliative care and a shortage of specialist palliative care providers, limitation of public funds, lack of availability of opioid analgesics, and poor public awareness about palliative and end-of-life care.[1-3]

In India, 80%–85% of the population spends out of pocket for their health-related expenses and around 39 million individuals becoming poorer every year due to rising health-related costs. Most of these costs are related to aggressive medical interventions in the last few days of life[3].

In our hospital setting we segregate patients between palliative care and curative care by planning early goals of care and we have end of life care policy at our institute. We divide our patients into patients requiring ICU care, high dependency unit care and palliative care according to ECOG performance status. ECOG-PS is considered an important prognostic factor and should be employed to make treatment decisions in daily practice. Lack of formal triage system impacts timely intervention and mortality. Triage protocol of our institute mandates shifting of only critically ill patients to ICU in which curative domain is predominant rather than terminally ill with no or very less chances of reversibility like malignancies, decompensated cardiac, renal, liver and neurological debilitating disease with keeping in mind the principle of correct the correct tables by which we often treat the correctable causes in palliative care. Most of the studies evaluate the prognostic criteria and comparisons of different scores. There are very less studies which describe the patient's characteristics, number of co morbidities and their final outcome. [3-10]

This study will help to identify the primary age group admitted in ICU, primary cause of admission, mean duration of, stay, mortality rate and cause of mortality and integration of ECOG PS scale to identify patients needing palliative care for better utilization of ICU resources, which helps to evaluate the relation between demographic characteristics of ICU admissions and cause of mortality among them and the effect of integration of critical care and palliative care with the help of ECOG scale. Such information can be useful for better utilization of resources to ensure prioritization and timely assessment of patients to provide appropriate care to patients in need of intensive care and triaging from those who need palliative care.

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**Materials and Methods**

A Retrospective study was conducted between the year January 2019 to December 2019 at JK Hospital & LN Medical College, Bhopal, M.P after obtaining permission from IEC. A total of 423 admissions are included. Information is gathered regarding the age of patient, gender, the primary reason for admission, the average duration of stay and the final outcome. We collected data at all levels including

clinical evaluation and investigations for determining the cause of mortality. This study includes only medical cases excluding surgical, road traffic accidents and post operative cases. Patients with poor ECOG performance i.e. less than or equal to three, status were shifted to palliative care unit. Patient’s families were counseled for end of life care according to the end of life care policies of our hospital.

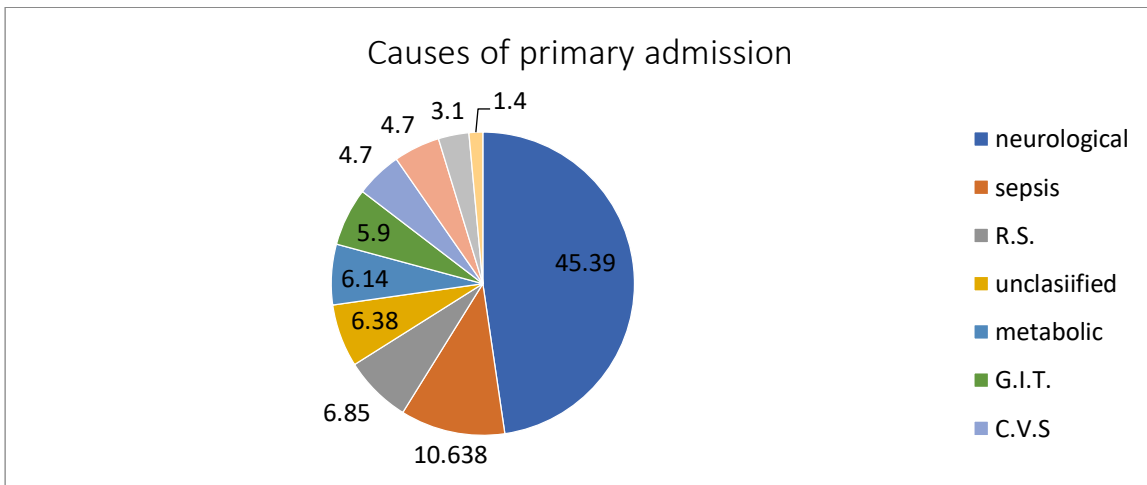
**Observation Chart**

**Table 1: Demographic profile of patients admitted in ICU**

Characteristic	Value
Age	57 yrs(55-59)
Average age of male admitted in ICU	58 yrs
Average age of female admitted in ICU	59yrs
Male	60.28%
Female	39.48%
Length of stay	5.15 days(3-11)

**Table 2: Primary Cause for ICU admission**

Neurological cases	No of cases=192	Percentage = 45.39%
Acute infarct	112	26.47%
Intracranial hemorrhage	20	4.49%
Seizures	17	4.25%
Meningitis	9	2.6%
<b>Cardiovascular</b>	21	4.73%
CAD	7	1.65%
<b>Respiratory</b>	29	6.87%
COPD	22	5.2%
Bronchial Asthma	6	1.41%
<b>Gastrointestinal</b>	25	5.91%
CLD	9	2.13%
Acute Gastroenteritis	9	2.13%
Acute Pancreatitis	7	1.65%
<b>Renal</b>	14	3.3%
CKD	14	3.3%
<b>Poisoning</b>	20	4.73%
<b>Hematological</b>	6	1.41%
<b>Metabolic</b>	26	6.15%
Diabetic Ketoacidosis	6	1.41%
Recurrent Hypoglycemia	6	1.41%
Electrolyte Imbalance	5	1.18%
<b>Myxedemic crisis</b>	4	0.94%
<b>Sepsis</b>	45	10.64%
<b>Unclassified</b>	27	6.39%
Dengue	9	2.13%



**Fig. 1: Diagrammatic Representation of Primary Cause for ICU admission**

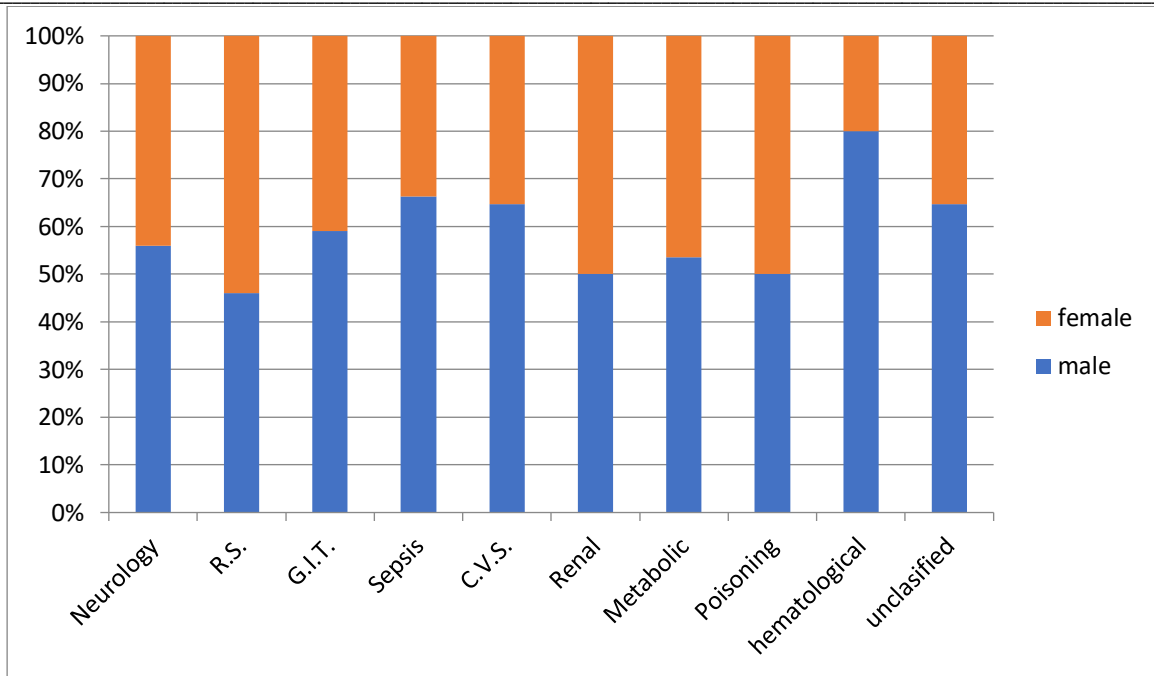


Fig. 2: Primary Diagnosis Comparison with Gender

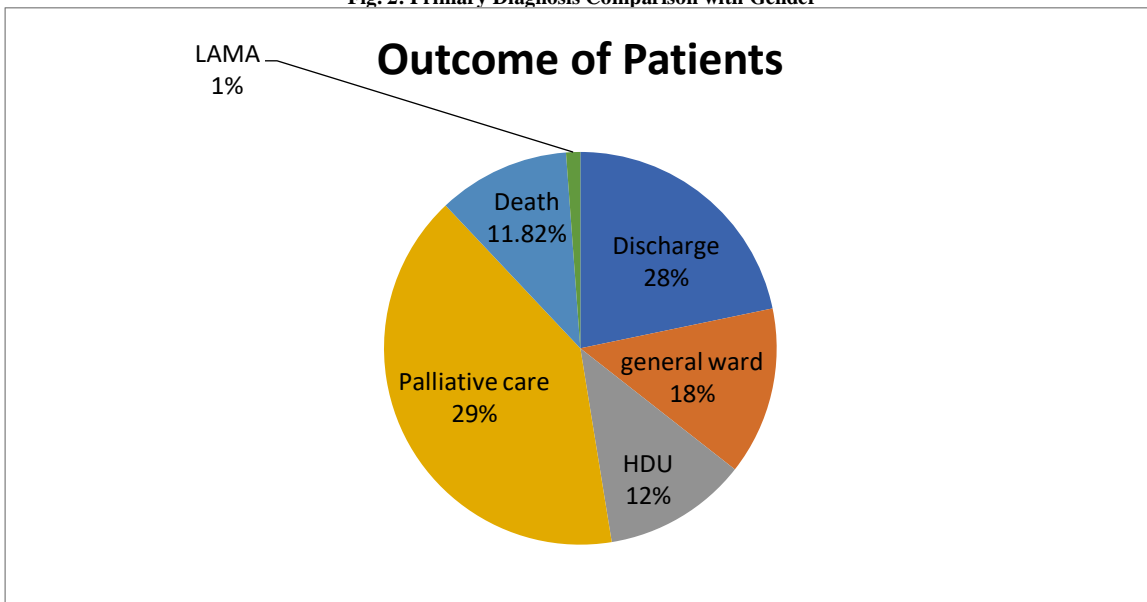


Fig. 3: Outcome of Patients

**Results**

Out of total 423 admissions in JK Hospital, Bhopal 255(60.28%) were males and 167(39.48%) were females. We calculated the average no of days spent in ICU which was found to be of 5.15 days(3-11) and mean age of the patients admitted to our hospital which was 57 years(55-59).

The majority of ICU admissions comprises of diseases relating to neurological origin(45.39%) out of which acute intracerebral infarct emerges as the major causative factor(26.47%) followed by intracranial hemorrhage (4.49%), followed by seizures (4.25%), followed by meningitis(2.6%). Most of the patients admitted with neurological causes presented with unconscious state , paresis of limbs or sudden onset paralysis. Sepsis emerged to be second major cause of admission (10.64%), Out of which urosepsis consisted of

4.8%, 2.9% of the total sepsis cases were of respiratory origin and 1.4% were due to hepatic complications.

The next system with most common complaints was found to be of respiratory origin (6.87%) which consisted of COPD(5.2%) followed by Bronchial Asthma(1.41%). Most common presentations were dyspnoea and lower respiratory tract infections, Gastrointestinal complaints were found to be (5.91%), which consisted of chronic liver disease (2.13%) and acute gastroenteritis (2.13%) followed by acute pancreatitis (1.65%), majority of cases with chronic liver disease presented with ascites and hepatic encephalopathy with deranged liver function tests and coagulation profile.

Renal was found to be (3.3%) which was mostly consisted chronic kidney disease (3.3%), most of the cases of chronic kidney disease presented with acute on chronic kidney disease. Cardiovascular complaints was found to (4.75%) with coronary artery disease as

major cause (1.65%). Metabolic causes comprised of 6.15% which comprised of diabetic ketoacidosis (1.41%) recurrent episodes of hypoglycemia (1.41%) electrolyte imbalance (1.18%), myxedemic crisis (0.94%) and poisoning consisted of 4.73%. Hematological causes were found to be rare causes of admission (1.41%)

The mortality rate calculated was 11.82%, out of which sepsis with MODS has emerged to be the major cause of deaths (44%) followed by acute cerebrovascular failure (32%), deaths due to cardiac causes were found to be eighteen percent, which comprised majorly of coronary artery disease (9%) followed by respiratory causes (4%) which primarily were due to respiratory failure (type 2) & poisoning due to celphos (2%). Mortality rates were slightly higher in males (58%) than females (42%). About sixty percent of patients who died were found to be of age >65 years.

Twenty eight percent patients were discharged and sent home. Nineteen percent patients were shifted to general wards and twelve percent were shifted to HDU, readmission to ICU were rare. Twenty nine percent of patients who were at the terminal stage of life received palliative care. The percentage of patients who took leave against medical advice which was decreased mainly due to end of life care policy (<2%).

Among the ICU non survivors 8% died within 24 hours of admission, all of 8% were above 65 yrs of age and 6% of total died due to massive infarcts in brain and 2% due to sepsis with MODS. 18% within 3 days of admission, out of which 64% belong to age group >65 years, 6% died due to sepsis with MODS 8% due to acute cerebrovascular accidents 2% due to poisoning by celphos and 2% due to pulmonary embolism. 22% died within a week, out of which 55% individuals were above 65 years of age, 10% of individuals died due to sepsis with MODS and 10% died due to acute cerebrovascular accidents. This shows that early mortality was caused by acute cerebrovascular accidents and sepsis with MODS accounts for late mortality. Nine percent of patients were found to be three or more than three co morbidities, 12.56% were found to be with two co morbidities and 23.56% patients were with single co morbidity. Hypertension was found to be single largest co morbidity (28.84%) found in patients followed by Diabetes (15.60%).

#### Statistical Analysis

Data was compiled using MS excel 2007 and analysis was done with the help of Epi-Info 7 software. Frequency and percentage were calculated & statistical test (Chi Square) was applied wherever applicable;  $p < 0.05$  was taken as statistically significant.

#### Discussion

According to the study conducted by JV Divatia et al median age was 54 years, the male female percentage was 66.1% and female 33.9% respectively. In our study the median age was 57 years The male female percentage was found to be 60.28% and 39.48%. Such information can be useful for decision making for policy makers. The average length of stay was 5.15 days which is similar to study by CP Parikh which showed average length of stay of 5.5 days. [1-4]

The most common causes of hospitalization were found to be neurological origin 192 (45.39%) which was acute cerebrovascular accident followed by sepsis 45 (10.64%) and Respiratory 24 (6.87%) COPD 22 (5.2%) which correlates with the study of JV Divatia which reveals that most common causes of hospitalization were neurological 624 followed by respiratory 613 and cardiovascular 585. This helps to identify the major cause of admission to the ICU to help formulate early treatment protocol. [1,5]

With advancing age the number of co morbidities and severity of illness increases. Sixty percent of deaths reported at our ICU were of patients above 65 years of age which is inconsistent with the study of R.J.Reddy et al which shows that the number of patients aged < 65 years died were more than those aged >65 years. Our mortality 11.82% was slightly lower than the mortality 18.1% conducted by the study of JV Divatia which compared the mortality of 124 ICU's. This lower mortality rate was achieved mainly due to integration with palliative care. The mortality is slightly higher in males 58% than

females 42% which is inconsistent with study of RJ Reddy which reveals that that 82.69% mortality were females. [1,6]

Our results show a major proportion of patients admitting in ICU need palliative care which will provide more beds to patients who are need of intensive care. A study conducted at Pune showed that 83% of people in India would prefer to die at home. However, due to a lack of palliative and end-of-life care provision, patients receive inappropriate aggressive medical interventions at the end of life, which drain the resources of patients and family. These unnecessary interventions steal the patients right to a dignified death. No implementation of national palliative care policy and ambiguous legal position are the most important detriments for the provision of effective end-of-life care in India. Prolonged and futile life support has undoubtedly imposed enormous economic strains on patients and families. Nonavailability of EOLC and rising costs have forced up to 78% of patients to leave hospital against medical advice. The families unilaterally initiate these discharges resulting in these patients not receiving any symptom relief or EOLC measures. [3-6]

Mortality rates are seen higher in elderly group in which prolonged medical interventions have not only increased the suffering of patient but also drained them financially and leads to lesser availability of medical resources to patients which are actually in need of them. Twenty nine percent of the terminally ill patients who were at the terminal stage of life were shifted to palliative care. These patients relatives themselves demanded palliative care after proper education from our palliative care team. The beds were then made available to the critical patients who are in actual need of them and have a chance of recovery, thereby optimizing the medical resources and decreasing the stress on patients resources. [7-9]

After incorporation of our institutional end of life care policy and discussing early goal of care with family members we achieved a good number of decreased leave against medical advice leave discharges with good patient and family satisfaction and a peaceful and good death near to their families. In our hospital setting lower mortality rate is achieved due to application of triage protocol which requires classification of patients on the basis of palliative care and curative care and transfer of only critically ill patients to ICU rather than terminally ill patients with less chances of reversibility. This could be facilitated by the critical care team in collaboration with a palliative care team. In our hospital setting we used ECOG status for identifying patients for ICU and palliative care to help early triage of patients, a Joint Position Statement of the Indian Society of Critical Care Medicine (ISCCM) and the Indian Association of Palliative Care (IAPC) also formulated an End Of Life Care Policy which sets goals of practicing End of life care. [10-11]

Mani RK et al in two of his studies gave guidelines for end-of-life and palliative care in Indian intensive care units. His aim was to develop an ethical framework and practical procedure for limiting inappropriate therapeutic interventions to improve the quality of care of the dying in the intensive care unit through a professional consensus process. The literature reviewed address key surveys, observational studies, randomized controlled and interventional studies as well as guidelines and recommendations for education and quality improvement from all over the world and India. Proposals from the Chair were debated and recommendations were formulated through a consensus process. [12,13]

Lesieur O et al performed a study in 43 intensive care units on withholding or withdrawal of treatment under French rules. This study aimed to investigate the procedural aspects of withholding/withdrawing treatment in French ICUs and their adequacy with the existing law. It concluded that more than half of deaths in the study population occurred after a decision to withhold or withdraw treatment. Among patients under withholding/withdrawal procedures, brain-injured subjects were more likely to undergo a withdrawal procedure. The prevalence of advance directives and designated trusted persons was low. Because patients' preferences were unknown in more than three quarters of cases, decisions remained primarily based on medical judgment. [14]

A Systematic Review by Pronovost PJ and Eden A et al on physician staffing patterns and clinical outcomes in critically ill patients was done. They selected randomized and observational controlled trials of critically ill adults or children. Studies examined ICU attending physician staffing strategies and the outcomes of hospital and ICU mortality and length of stay (LOS). They grouped ICU physician staffing into low-intensity (no intensivist or elective intensivist consultation) or high-intensity (mandatory intensivist consultation or closed ICU [all care directed by intensivist]) groups. High-intensity staffing was associated with lower hospital mortality in 16 of 17 studies (94%) No study found increased LOS with high-intensity staffing after case-mix adjustment. High-intensity vs low-intensity ICU physician staffing is associated with reduced hospital and ICU mortality and hospital and ICU LOS.[15,16]

The length of stay (LOS) in intensive care unit (ICU) nonsurvivors is not often reported, but represents an important indicator of the use of resources. LOS in ICU nonsurvivors may also be a marker of cultural and organizational differences between units. In this study by Strand K, Walther SM et al based on the national intensive care registries in Finland, Sweden, and Norway, the authors aimed to report intensive care mortality and to document resource use as measured by LOS in ICU nonsurvivors. Despite cultural, religious, and educational similarities, significant variations occur in the LOS of ICU nonsurvivors among Finland, Norway, and Sweden. Overall, ICU mortality is low in the Scandinavian countries. [17,18]

This study has its limitations as it is a retrospective, single centre study. We did not study the demographic characteristics and mortality rates of patients admitted to the hospital but only to the ICU. Our objective was to identify the major age group admitted to ICU with primary reason for admission and to observe their outcome in ICU as well as the effect of integration of palliative care in ICU. We acknowledge the fact that mortality data alone cannot provide complete information for making decisions. Further detailed studies are needed for better analysis.

#### Conclusion

In a general ICU population male elderly group comprises of a larger proportion along with higher mortality rate. Majority of patients were admitted with neurological origin with MODS as major cause of mortality. There is a correlation between advancing age and multi organ failure. In patients where aggressive medical interventions have shown futile results, palliative care has proven beneficiary in terms of better satisfaction of patients and their families. Thus unnecessary financial burden have been avoided and better utilization of medical facilities have been achieved which are already limited.

#### References

- Jigeeshu V, Divatia, Pravin R, Amin, Nagarajan Ramakrishnan, Farhad N, Kapadia, Subhash Todi et al Intensive Care in India: The Indian Intensive Care Case Mix and Practice Patterns Study, *Indian J Crit Care Med.* 2016 Apr;20(4):216-25.
- Chen YC, Lin SF, Liu CJ et al. Risk Factors for ICU Mortality in Critically Ill Patients. *J Formos Med Assoc* 2001; 100(10):656-61
- N Salins, J Johnson, S Macaden. Feasibility and Acceptability of Implementing the Integrated Care Plan for the Dying in the Indian Setting: Survey of Perspectives of Indian Palliative Care Providers. *Ind J Palliat Care.* 2017 Jan- Mar 2017;23(1):3-12.
- Mayr VD, Dünser MW, Greil V et al. Causes of Death and Determinants of Outcome in Critically Ill Patients. *Crit Care* 2006; 10(6): R154.
- Reddy RJ, Reddy PVN. Analytical study of mortality in intensive care unit. *Int J Adv Med* 2019;6:1054-7.
- S N Myatra, N Salins, et al. End-of-life care policy: An integrated care plan for the dying. A Joint Position Statement of the Indian Society of Critical Care Medicine (ISCCM) and the Indian Association of Palliative Care (IAPC). *Ind J Crit Care Med.* 2014 Sep;18(9):615-35.
- Orban JC, Walrave Y, Leone M, Allaouchiche B, Lefrant JY, Constantin JM, et al. Causes and characteristics of death in ICU: a national study. *Intensive care medicine experimental.* 2015 Dec;3(1):A770.
- Omar MA, Aram FO, Saeed N, Banafa MB. Causes of mortality among critically ill patients admitted in intensive care unit. *Bahrain Medical Bulletin.* 2015 Sep;37(3).
- Fuchs L, Chronaki CE, Park S, Novack V, Baumfield V, Scott D, McLennan S, Talmor D, Celli L. ICU admission characteristics and mortality rates among elderly and very elderly patients. *Intensive Care Medicine* 2012 Oct;38(10):1654-1661. doi:10.1007/s00134-012-2629-6.
- Manu Varma MK, Krishna B, Sampath S. Secular Trends in An Indian Intensive Care Unit-Database Derived Epidemiology: The Stride Study. *Indian J Crit Care Med* 2019;23(6):251-257.
- Moitra VK, Guerra C, Linde-Zwirble WT, Wunsch H. Relationship between ICU length of stay and long-term mortality for elderly ICU survivors. *Crit Care Med.* 2016 Apr;44(4):655-62.
- Mani RK, Amin P, Chawla R, Divatia JV, Kapadia F, Khilnani P, Myatra SN, Prayag S, Rajagopalan R, Todi SK, Uttam R. Guidelines for end-of-life and palliative care in Indian intensive care units: ISCCM consensus Ethical Position Statement. *Indian journal of critical care medicine: peer-reviewed, official publication of Indian Society of Critical Care Medicine.* 2012 Jul;16(3):166.
- Mani RK. Coming together to care for the dying in India. *Indian journal of critical care medicine: peer-reviewed, official publication of Indian Society of Critical Care Medicine.* 2014 Sep;18(9):560.
- Lesieur O, Leloup M, Gonzalez F, Mamzer MF. Withholding or withdrawal of treatment under French rules: a study performed in 43 intensive care units. *Annals of intensive care.* 2015 Dec;5(1):1-2.
- Pronovost PJ, Angus DC, Dorman T, Robinson KA, Dremiszov TT, Young TL. Physician staffing patterns and clinical outcomes in critically ill patients: a systematic review. *Jama.* 2002 Nov 6;288(17):2151-62.
- Eden A. Physician Staffing Patterns and Clinical Outcomes in Critically Ill Patients: A Systematic Review. *Survey of Anesthesiology.* 2003 Aug 1;47(4):196-7.
- Prayag S. ICUs worldwide: critical care in India. *Critical care.* 2002 Dec;6(6):1-2.
- Strand K, Walther SM, Reinikainen M, Ala-Kokko T, Nolin T, Martner J, Mussalo P, Søreide E, Flaatten HK. Variations in the length of stay of intensive care unit nonsurvivors in three Scandinavian countries. *Critical care.* 2010 Oct;14(5):1-8.

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