Evaluate the Outcomes of Patients with Sepsis and Find out the Mortality Rate

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Abstract: Background: *Sepsis is a phenomenon caused by an infection that causes physiologic, pathologic, as well as biochemical problems.*
Objective: *This paper aims to evaluate the outcomes of patients with sepsis and find out the mortality rate.*
Patients and methods: *This paper was presented as a cross-sectional study where specialize to evaluate the outcomes of patients with sepsis and find out the mortality rate which get 100 cases in different hospitals in Iraq from 26th August to 18th 2022. This paper was analysed and evaluated of mortality rate with sepsis patients by SPSS program. The characteristics of demographic baseline outcomes were progressed with females and males for ages older than 25 and under than 70 years.*
Discussion: *The interdisciplinary sepsis quality improvement project resulted in a considerable improvement in organizational sepsis mortality at the study hospital, with an observed sepsis mortality decrease of 8%. This resulted in a 37% decrease in sepsis O/E mortality. Patients having sepsis were considerably fewer likely to die following the intervention despite adjusting for patient variables and predicted mortality (OR = 0.64). Septic patients had an ICU stay that was 1.3 days shorter and an overall hospital stay that was 2.6 days shorter. With a baseline rate of death of 30% and an observed rate of mortality of 18.9%, the study team believes that the sepsis campaign saved 56 lives. There is significant evidence that sepsis teaching initiatives have a good impact. The study of complications was found to be fewer in comparisons with previous studies were, got 46 cases, and the risk factor of complications was got a higher percentage considered as death and gangrene, with 24 cases, where that result to blood loss during operative and reduce with blood pressure.*

Conclusion: *The implementation of our study into the sepsis quality improvement program resulted in a decrease within the overall in-hospital sepsis death rate. Patients with sepsis during the treatment period had an approximate 35% decreased probability of dying. ICU days and total hospital LOS were also considerably reduced. Although 44 instances reduced projected direct consequences, the effect was not considered statistically significant.*

Keywords: *Sepsis, Mortality, LOS (Days), ICU Days, Systolic Blood Pressure, and Diastolic Blood Pressure.*

1. INTRODUCTION

Sepsis is a phenomenon caused by an infection that causes physiologic, pathologic, as well as biochemical problems. In industrialized health-care systems, sepsis is addressed within the intensive care unit (ICU). However, most patients with sepsis are initially managed on the Emergency Department (ED), emphasizing the fact that the length of stay in the ED should be 6 hours or less [1,2]. It is a common disease that contributes for 10% of ICU admissions. It is associated in an in-hospital mortality rate between 10% to 20%. The lungs, abdomen, and urinary tract are the most common major sites of infection that lead to sepsis. Usually, 50% of cases of sepsis begin with a lung infection. One-third of the time, no source may be discovered. [3-8]

Sepsis accompanied with organ failure, hypoperfusion, or hypotension is referred to as severe sepsis. In adults, septic shock is defined as an acute circulatory failure marked by prolonged arterial hypotension despite sufficient volume resuscitation in the absence of any cause of hypotension [9]. Sepsis was characterized in 2016 as a potentially fatal organ failure produced by a dysregulated host response toward infection. This new definition stresses the importance for the non-homeostatic host reaction to an infection, the potential fatality that is far greater than a simple infection, and the urgency of identification. [10-13]

Organ dysfunction is defined in clinical terms as an increase with a sequential organ failure assessment (SOFA) rating of two percentage points or more, which is associated with an in-hospital mortality rate of more than 10%. Despite appropriate volume resuscitation, 5 Sepsis patients with blood lactate levels more than 20 mmol/L (180 mg/L) had a hospital death rate greater than 40%.6 Sepsis patients may not appear seriously ill when they present to the emergency department (ED). However, their condition may deteriorate rapidly; thus, early recognition in sepsis as well as a systemic inflammatory response syndrome (SIRS) within the critically ill patient, as well as prompt introduction of antibiotic and goal-directed therapies, has demonstrated a reduction to mortality, morbidity, and multiple organ failure, which increases the length of stay. [14-16]

Multiple scoring methods, such as SOFA, rapid SOFA (qSOFA), mortality emergency department (MEDS) rating, sepsis assessment for patients' emergency department (SPEED) score, and others, can be used to determine sepsis mortality. All of the systems measure deviations based on clinical observations, laboratory data, or treatment actions. SOFA is the most often used score in ICUs nowadays. The MEDS score is the most generally established scoring system for predicting death in patients who have sepsis in the emergency department

[17]. This paper aims to evaluate the outcomes of patients with sepsis and find out the mortality rate.

2. PATIENTS AND METHODS

This paper was presented as a cross-sectional study where specialize to evaluate the outcomes of patients with sepsis and find out the mortality rate which get 100 cases from different hospitals in Iraq from 26th August to 18th 2022. This paper was analysed and evaluated of mortality rate with sepsis patients by SPSS program. The characteristics of demographic baseline outcomes were progressed with females and males for ages older than 25 and under than 70 years.

The demographic outcomes were characterized features of baseline health outcomes of sepsis patients based on age between 25-70 years, sex with females and males, BMI, <30.4 and >30.4, symptoms which include Chills, Confusion, Disorientation, Fever, and Rapid breathing and heart rate as well as comorbidities which have Cardiovascular event, Chronic kidney disease, Diabetes, Hypertension, Ischemic heart diseases where these features can be find in Table 1, Table 2, Table 3, Table 4, and Table 5.

Furthermore, this paper was distributed of sepsis patients between systolic blood pressure and diastolic blood pressure, which determines with systolic blood pressure and diastolic blood pressure sepsis as well as changes of treatments uses with sepsis patients between propofol, midazolam, and dexmedetomidine which distributed with Propofol, midazolam, and dexmedetomidine where these outcomes can be seen in Figure 1 and Figure 2.

To further of outcomes, this data was also estimated postoperative complications of sepsis patients where find death, gangrene, Infection, Kidney failure, Permanent brain damage, and Permanent lung damage, where the results can be clearly in Table 6.

Besides that, this study was determined of mortality risk into sepsis patients which divided into (0% to 5%) - (5.1% to 10%) -(10% to 15) - and (>15%) that this outcome was found in Figure 3, as well as determinations of health mortality outcomes where to include Mortality, LOS (days), and ICU days that it be resulted in Figure 4.

Finally, this paper was progressed the purpose of our study through characterized with estimations of in-hospital mortality outcomes into sepsis patients where have Complications, Comorbidities, BMI, Sex, and Mortality risk. Where these results were got on in Table 7.

3. RESULTS

Table 1: Features of baseline health outcomes of sepsis patients based on age.

N	V	100
	M	0
Me		48.9400
SEOM		1.37222
Med		49.5000

M	62.00^a
SD	13.72222
Va	188.299
R	45.00
Min	25.00
Max	70.00

Table 2: Features of baseline health outcomes of sepsis patients based on sex.

		Freq	Per (%)	VP (%)	CP (%)
V	Female	40	40.0	40.0	40.0
	Male	60	60.0	60.0	100.0
	T	100	100.0	100.0	

Table 3: Features of baseline health outcomes of sepsis patients based on BMI.

		Freq	Per (%)	VP (%)	CP (%)
V	<30.4	37	37.0	37.0	37.0
	>30.4	63	63.0	63.0	100.0
	T	100	100.0	100.0	

Table 4: Features of baseline health outcomes of sepsis patients based on symptoms.

		Freq	Per (%)	VP (%)	CP (%)
V	Chills	22	22.0	22.0	22.0
	Confusion	14	14.0	14.0	36.0
	Disorientation	19	19.0	19.0	55.0
	Fever	26	26.0	26.0	81.0
	Rapid breathing and heart rate	19	19.0	19.0	100.0
	T	100	100.0	100.0	

Table 5: Features of baseline health outcomes of sepsis patients based on comorbidities.

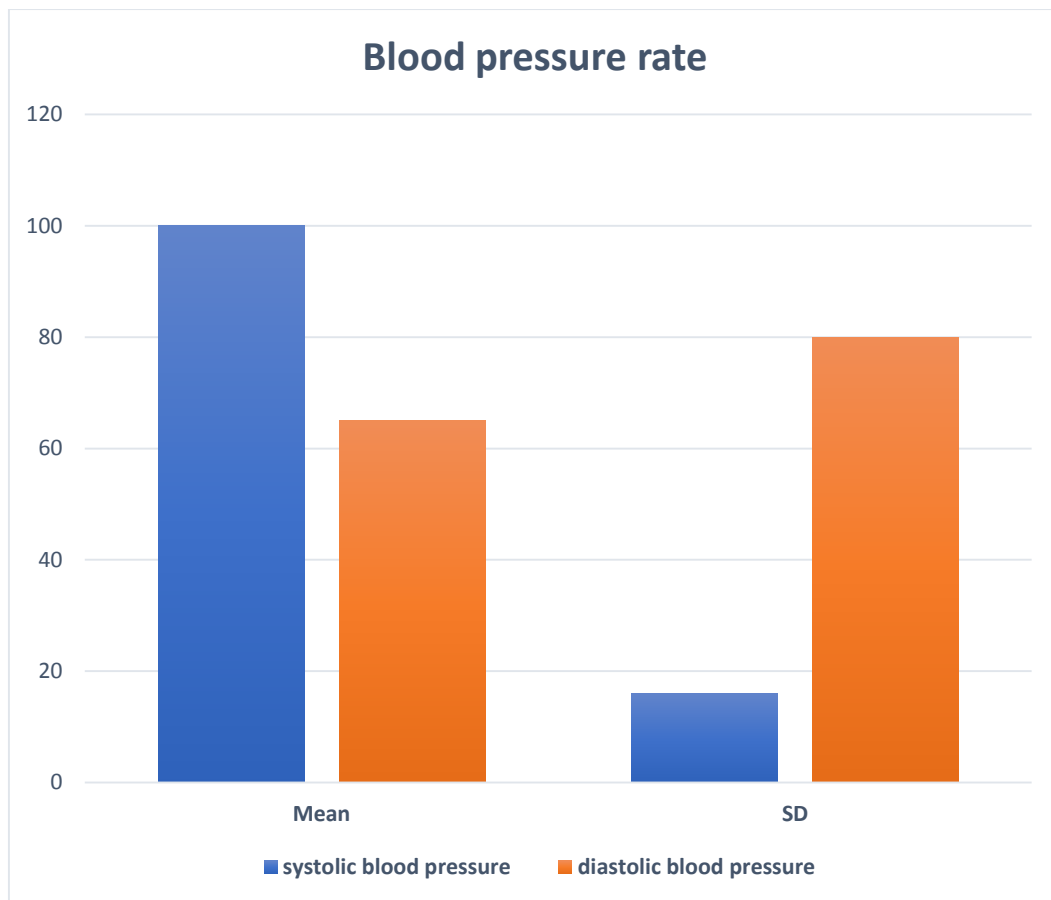|		Freq	Per (%)	VP (%)	CP (%)
V	Cardiovascular event	12	12.0	12.0	12.0
	Chronic kidney disease	15	15.0	15.0	27.0
	Diabetes	36	36.0	36.0	63.0
	Hypertension	29	29.0	29.0	92.0
	Ischemic heart diseases	8	8.0	8.0	100.0
	T	100	100.0	100.0	

Figure 1: Distribution of sepsis patients between systolic blood pressure and diastolic blood pressure.
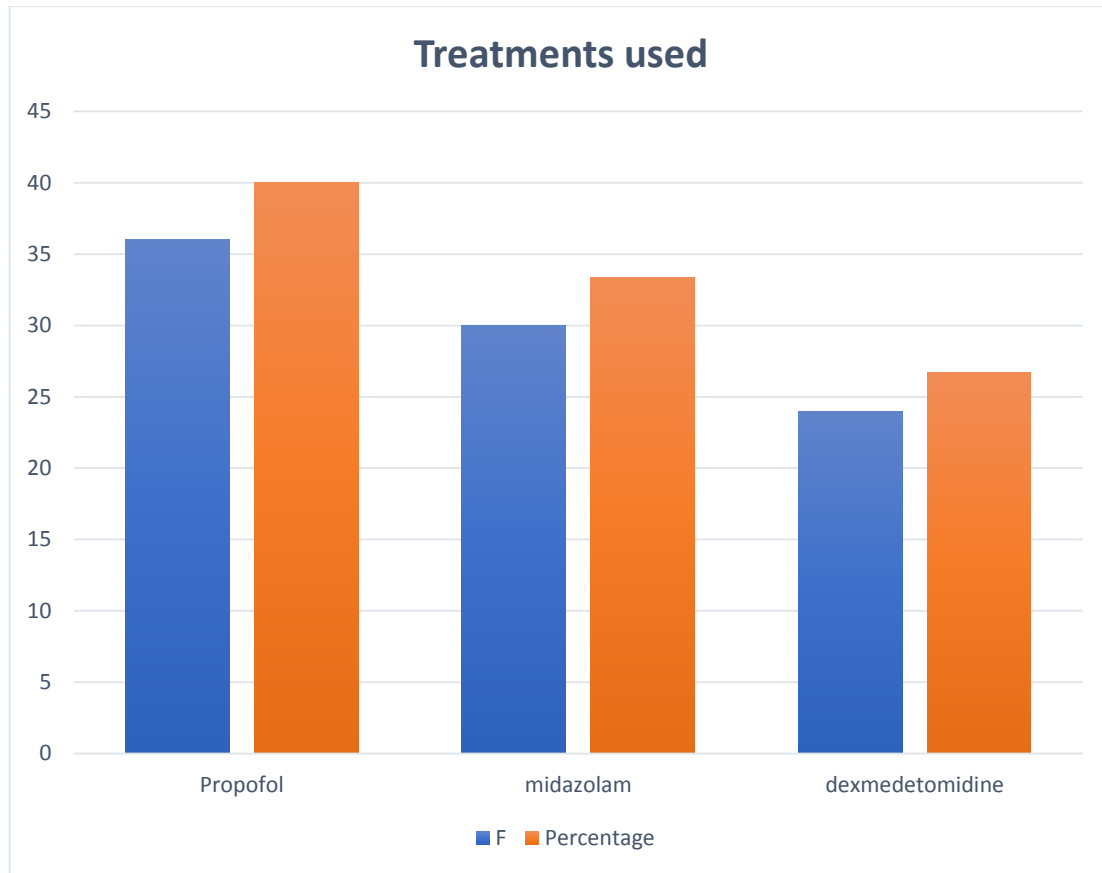
Figure 2: Changes of treatments uses with sepsis patients between propofol, midazolam, and dexmedetomidine.

Table 6: Postoperative complications of sepsis patients.

		Freq	Per (%)	VP (%)	CP (%)
V	death	12	12.0	12.0	12.0
	gangrene	12	12.0	12.0	24.0
	Infection	8	8.0	8.0	32.0
	Kidney failure	3	3.0	3.0	35.0
	Non	56	56.0	56.0	91.0

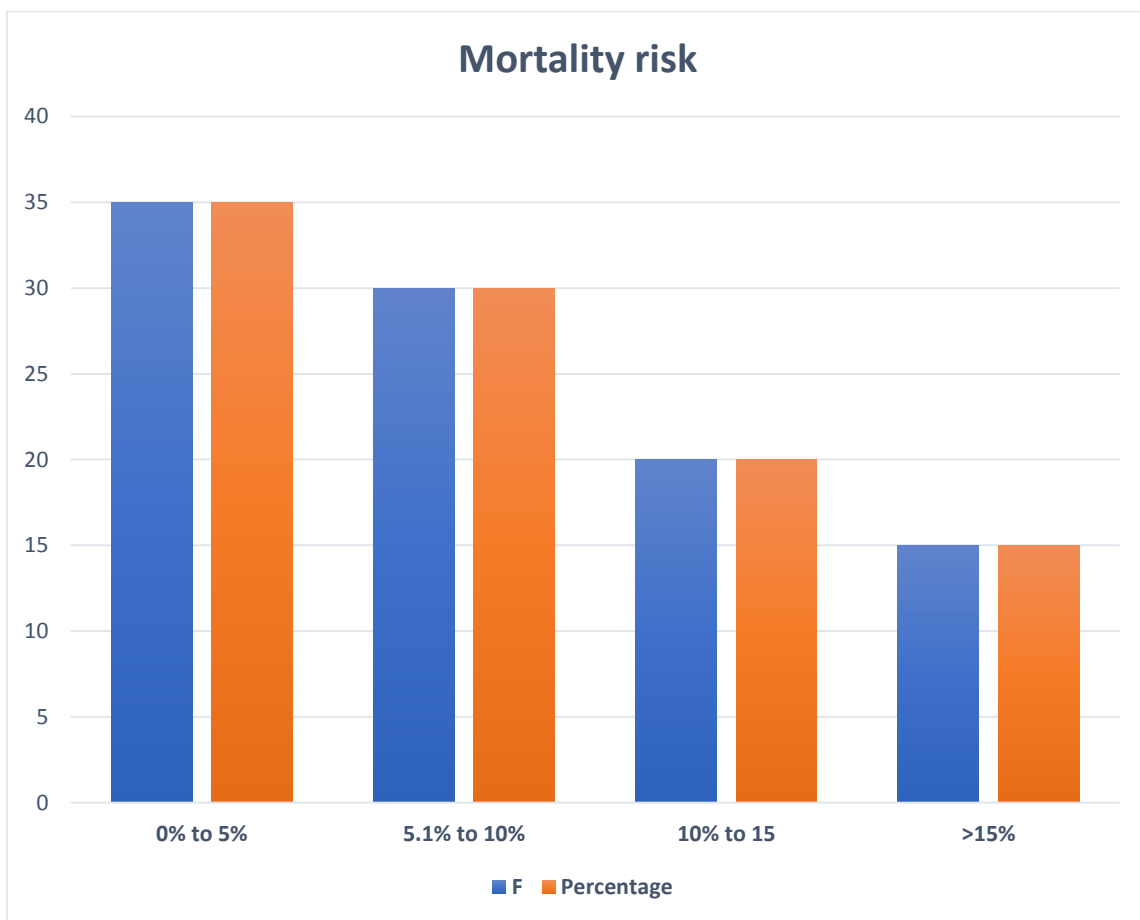|				
Permanent brain damage	5	5.0	5.0	96.0
Permanent lung damage	4	4.0	4.0	100.0
T	100	100.0	100.0	

Figure 3: Determinations of mortality risk into sepsis patients.
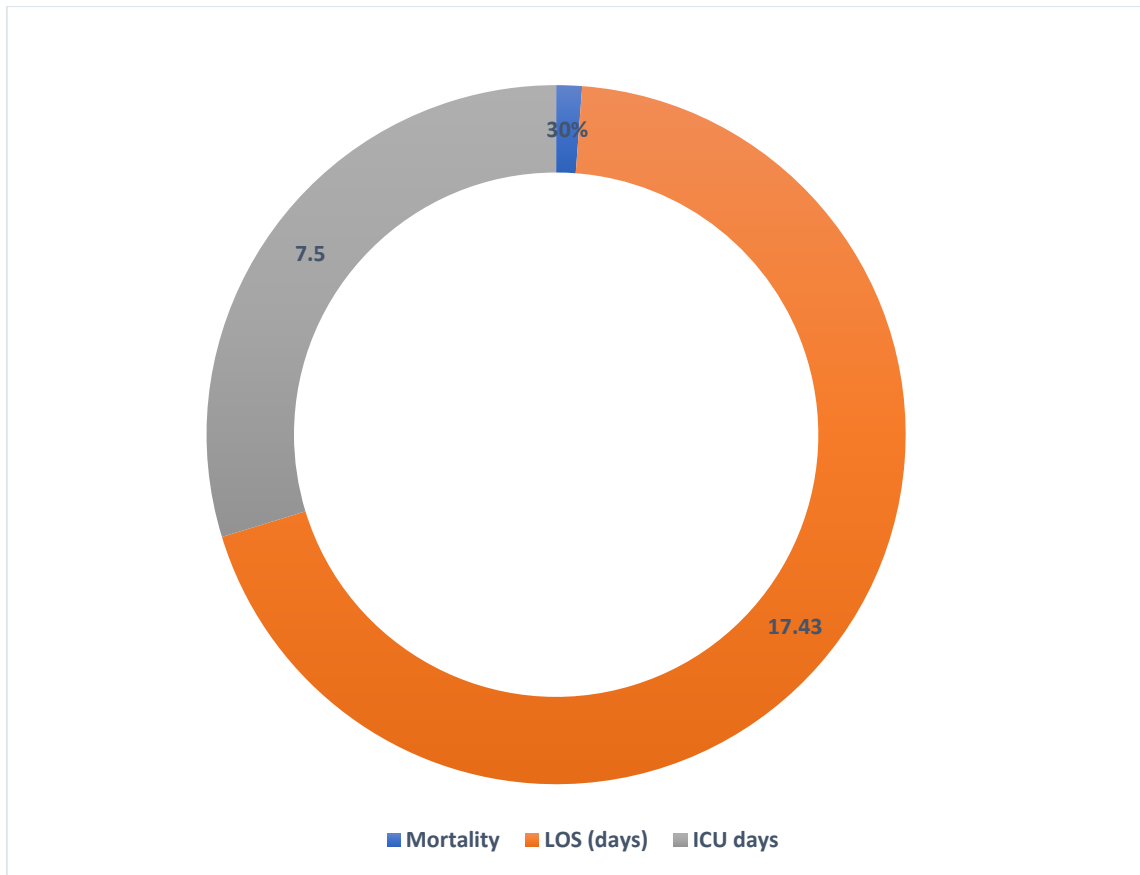
Figure 4: Determinations of health mortality outcomes.

Table 7: Estimations of in-hospital mortality outcomes into sepsis patients.

Parameters	Odds Ratio	95% confidence (Lower)	(Upper)	P-value
Complications				
gangrene	1.60	0.79	2.66	0.144
Infection	1.45	1.20	2.77	0.0015
Kidney failure	1.56	1.43	2.44	0.00244
Comorbidities				

Chronic kidney disease	2.46	1.65	3.45	0.0032
Diabetes	1.45	0.46	2.11	0.0011
Hypertension	3.42	1.55	4.33	0.066
BMI				
<30.4	3.58	3.23	5.68	0.0424
>30.4	5.64	4.21	6.74	0.325
Sex				
Males	1.32	0.86	3.24	0.0334
Females	1.17	0.88	3.55	0.0223
Mortality risk				
0% to 5%	1.75	1.20	2.66	0.0458
5.1% to 10%	4.23	4.50	6.60	0.0366
10% to 15	5.34	4.21	6.63	0.0332
>15%	4.53	4.41	7.65	0.0243

4. DISCUSSION

The interdisciplinary sepsis quality improvement project resulted in a considerable improvement in organizational sepsis mortality at the study hospital, with an observed sepsis mortality decrease of 8%. This resulted in a 37% decrease in sepsis O/E mortality. Patients having sepsis were considerably fewer likely to die following the intervention despite adjusting for patient variables and predicted mortality (OR = 0.64). Septic patients had an ICU stay that was 1.3 days shorter and an overall hospital stay that was 2.6 days shorter. With a baseline rate of death of 30% and an observed rate of mortality of 18.9%, the study team believes that the sepsis campaign saved 56 lives.

There is significant evidence that sepsis teaching initiatives have a good impact. Ferrer et al. [18] described the favourable impacts of a structured sepsis education program. A nationwide teaching initiative into Spain that promoted bundles of treatment of severe sepsis as well as septic shock resulted in enhanced guideline compliance with a 4.3% absolute mortality rate in hospitals decrease. Similarly, Jeon and colleagues found that an instructional program aimed at managing severe sepsis and septic shock enhanced either resuscitation bundle compliance as well as attainment of their respective end objectives.

In the pilot research performed by Girardis [19], in-hospital mortality was reduced from 85% to 32%, owing primarily to the sepsis program's training efforts. The current study's findings show that education has a significant influence on improving patient outcomes, including an immediate reduction of mortality following the implementation of a structured sepsis instructional program.

The study of complications was found to be fewer in comparisons with previous studies were, got 46 cases, and the risk factor of complications was got a higher percentage considered as death and gangrene, with 24 cases, where that result to blood loss during operative and reduce with blood pressure.

5. CONCLUSION

The implementation of our study into the sepsis quality improvement program resulted in a decrease within the overall in-hospital sepsis death rate. Patients with sepsis during the treatment period had an approximate 35% decreased probability of dying. ICU days and total hospital LOS were also considerably reduced. Although 44 instances reduced projected direct consequences, the effect was not considered statistically significant.

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