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Comparison of qSOFA, MEWS and NEWS Score for Diagnosis and Prediction of Mortality in Sepsis in a LMIC settings

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Abstract

Background

The Early Warning Score, including qSOFA, MEWS, and NEWS, has been extensively used for the early diagnosis of sepsis and the prediction of sepsis-related mortality. The utility of these scores in low- and middle-income countries, such as Bangladesh, has not been explored. This study aimed to evaluate and compare these scores for the early diagnosis of sepsis and the prediction of sepsis-related mortality.

Methods

A cross-sectional study was conducted in the department of internal medicine and intensive care unit (ICU) at Bangabandhu Sheikh Mujib Medical University (BSMMU), currently name as Bangladesh Medical University (BMU) from January 2023 to June 2024. A total of 142 suspected sepsis cases were included in the study based on the selection criteria following consecutive sampling technique. Demographic profile, clinical, and laboratory parameters were recorded and bedside tools-qSOFA, MEWS and NEWS score were calculated at admission. Patients were monitored on day 7 or at the time of release, whichever occurred later, to evaluate outcomes.

Results

Among the study participants 110 (77.5%) of the participants were suffering from sepsis and 58 (52.7%) patients died of sepsis. Sepsis was more prevalent among older, male and smokers. Mean qSOFA, MEWS and NEWS score significantly higher among those with sepsis and who did not survive. NEWS (≥ 8.0) showed best diagnostic performance with 88.18% sensitivity and 90.62% specificity and MEWS (≥ 8.0) had highest accuracy with 67.24% sensitivity and 80.77% specificity for mortality prediction.

Conclusion

NEWS was most accurate for sepsis diagnosis, and MEWS was superior for predicting in-hospital mortality in sepsis in Bangladesh.

Background

Sepsis is a clinical illness marked by an aberrant physiological, pathological, and metabolic response to infection, resulting in potentially fatal organ malfunction and circulatory collapse [1]. It continues to be a significant contributor to hospitalization, morbidity, and mortality, representing roughly 10% of Intensive Care Unit (ICU) admissions, with in-hospital fatality rates estimated between 20% and 50% [1–5], resulting in 5.3 million fatalities globally each year [6]. The clinical severity and complexity of sepsis pathogenesis call for well-defined diagnostic criteria and efficient treatment approaches. Nevertheless, these fatalities can be averted with timely and effective intervention. The prompt initiation of antibiotics and adequate resuscitation decreases mortality in sepsis [7, 8]. Early diagnosis or prediction of sepsis has demonstrated the ability to minimize treatment delays, enhance appropriate care, and decrease mortality and treatment expenses [9, 10].

Several tools have been developed to identify sepsis and predict poor outcomes. The varied clinical presentation of sepsis necessitates the use of simple, quick, and reliable clinical screening techniques. The Systemic Inflammatory Response Syndrome (SIRS) criteria are widely used for screening and diagnosing sepsis [11]. In 2016, the Third International Consensus Definitions for Sepsis and Septic Shock (Sepsis-3) established the quick SOFA (qSOFA) score, a simplified version of the SOFA score aimed to improve early identification of patients suspected of having sepsis and at risk of poor prognosis [1]. The qSOFA score is intended for use in a variety of contexts, including the emergency department, hospital wards, and prehospital scenarios [1]. In addition to qSOFA, various other scoring systems like Modified Early Warning Score (MEWS) and the National Early Warning Score (NEWS) are most commonly researched and employed for early detection of sepsis [12–14]. Bedside scoring systems are clinical tools developed to facilitate the early identification of sepsis and patient deterioration, with prior evidence demonstrating their association with mortality [15–18].

While qSOFA, MEWS, and NEWS were initially developed and validated in high-income countries (HICs), their applicability and performance in low- and middle-income countries (LMICs) have not been thoroughly investigated. Research in LMICs has yielded inconsistent findings, likely attributable to differences in healthcare infrastructure, patient demographics, and disease prevalence. Each scoring system has unique strengths and limitations, making it crucial to assess their diagnostic and prognostic performance across various clinical settings. A direct comparison of these tools is essential in resource-limited settings, where timely sepsis recognition and accurate outcome prediction are critical for optimizing patient care. Assessing their utility in the ward and intensive care unit (ICU) can guide context-specific clinical decisions and assist in prioritizing interventions. This study evaluates and compares the diagnostic accuracy and predictive performance of the qSOFA, MEWS, and NEWS scoring systems in identifying sepsis and predicting in-hospital mortality in a tertiary care hospital in Bangladesh.

Methods

Study design and setting

Thecross-sectional study was carried out in the Department of Internal Medicine and Intensive Care Unit (ICU) at Bangabandhu Sheikh Mujib Medical University (BSMMU), Shahbag, Dhaka, from January 2023 to June 2024. Ethical approval was obtained from the Institutional Review Board of BMU (Reference No. BSMMU/2023/3008). The study was conducted in accordance with the ethical principles of the Declaration of Helsinki. Written informed consent was obtained from all participants before enrolment.

Study participants and sampling

A total of 142 patients aged 18 years and older, suspected of sepsis, were included in the study through consecutive sampling, following the acquisition of informed written consent. Patients with non-infectious diseases, as well as those with trauma, intoxication, cardiac arrest, epilepsy, and burns were excluded from the study. The patient enrolment flow is shown in Fig. 1.

Data collection

Data was collected using a pre-tested questionnaire. The questionnaire was developed specifically for this study. An English-language version of the questionnaire is provided as Supplementary File 1 (**Supplementary File-1**). A comprehensive history of demographics (age, gender), clinical parameters (level of consciousness, oxygen saturation, requirement for oxygen supplementation, urine output), physical parameters (blood pressure, pulse rate, respiratory rate, temperature, urine output), and laboratory investigations (white blood cell count, serum lactate) was collected. The qSOFA, NEWS, and MEWS were computed. The qSOFA scale has three criteria: altered mental status indicated by a Glasgow Coma Scale (GCS) score of < 15, a systolic blood pressure (SBP) of ≤ 100 mmHg, and a respiratory rate of ≥ 22 breaths per minute [1, 19]. The MEWS scale assesses six physiological parameters: temperature, heart rate, SBP, respiration rate, level of consciousness (utilizing the AVPU scale: Alert, Voice, Pain, Unresponsive), and urine output [14, 20]. The NEWS scale has seven variables: respiratory rate, peripheral oxygen saturation (SpO_2), supplementary oxygen usage, SBP, heart rate, temperature, and neurological status (AVPU scale) [21].

Sepsis was identified by the attending physicians upon the patient's admission based on SIRS and serum lactate levels (> 2 mmol/L). The patients were monitored on day 7 or at discharge, whichever occurred later, to assess short-term clinical outcomes (necessity for ICU transfer, complications, and mortality).

Statistical analysis

Statistical analysis was performed using SPSS. Continuous variables were summarized as mean ± standard deviation, median, and range, while categorical variables were presented as frequencies and proportions. Data normality was assessed using the Shapiro-Wilk test. Comparisons of qSOFA, MEWS, and NEWS scores between sepsis vs. non-sepsis and death vs. survived groups were conducted using the Mann-Whitney U test. Association of demographic characteristics, clinical parameters and comorbidity with sepsis was assesses by Chi-square test or Fisher’s exact test as appropriate. Receiver Operating Characteristic (ROC) curve analysis was employed to determine optimal cut-off values for each scoring system. Sensitivity, specificity, positive and negative predictive values, and diagnostic accuracy were calculated with 95% confidence intervals. The Delong test was used to compare the ROC curves of qSOFA, MEWS, and NEWS for both sepsis diagnosis and mortality prediction.

Results

Participants characteristics

Among all the participants, majority (40.8%) were from 41–60 years age group and the mean age of the participants was 52.89 ± 16.35 years. About 51.4% were female.Among the study participants 110 (77.5%) was diagnosed as a case of sepsis and rest patients 32 (22.5%) were not suffering from sepsis.Patients with sepsis were significantly older, with a higher proportion aged > 60 years (p value: 0.001), and more likely to be male (p value: 0.001) (Table 1). Clinically, sepsis patients had significantly elevated respiratory rates (p value: 0.001), pulse rates (p value: 0.001), body temperatures (p value: 0.009) and lower systolic (p value: 0.01) and diastolic blood pressures (p value: 0.001).About 62% patients were diabetic, 38.0% were hypertensive, 20.4% were smoker, and 11.3% were suffering from chronic kidney disease. Smoking was significantly more common in the sepsis group(p value: 0.006), while other comorbidities such as diabetes mellitus(p value: 0.370), hypertension (p value: 0.944), chronic kidney disease(p value: 0.525), and malignancy(p value: 0.456) showed no statistically significant differences. The mean GCS score was significantly lower among sepsis patients compared non-sepsis (11.2 vs 15), indicating altered mental status (p value: 0.001). Sepsis patients also had lower oxygen saturation levels

(92.76 vs 97.25) and a significantly higher requirement for supplemental oxygen (68.2% vs 3.1%). In laboratory findings, white blood cell (WBC) counts (18129.62 vs 12834.38 Cumm), were markedly elevated in the sepsis group(p value: 0.001) as was serum lactate (8.39 vs 1.46) (p value: 0.001), indicating metabolic stress and tissue hypoperfusion (Table 1).

Table 1
Comparison of demographic, clinical, physical and laboratory parameter among patients with or without sepsis

Parameters			Sepsis		Total	P value
			Yes (n = 110)	No (n = 32)		
Demographic characteristics	Age (years)	18–40	25 (22.7)	6 (18.8)	31 (21.8)	[a]0.001
		41–60	36 (32.7)	22 (68.8)	58 (40.8)	
		> 60	49 (44.5)	4 (12.5)	53 (37.3)	
	Gender	Male	62 (56.4)	7 (21.9)	69 (48.6)	[a]0.001
		Female	48 (43.6)	25 (78.1)	73 (51.4)	
Physical parameters	Respiratory rate (breaths/min)	Mean ± SD	24.83 ± 5.10	19.88 ± 3.91	23.71 ± 5.27	[b] 0.001
	Pulse rate (beats/min)	Mean ± SD	109.26 ± 18.88	97.44 ± 0.69	106.60 ± 18.04	[b] 0.001
	Systolic blood pressure (mmHg)	Mean ± SD	103.58 ± 27.84	110.63 ± 19.00	105.17 ± 26.22	[b] 0.01
	Diastolic blood pressure (mmHg)	Mean ± SD	64.99 ± 17.01	72.81 ± 9.58	66.75 ± 15.96	[b] 0.001
	Temperature (^{0}F)	Mean ± SD	39.37 ± 0.60	39.08 ± 0.50	39.31 ± 0.59	[b] 0.009
Comorbidity and risk behavior	Smoking		28 (25.5)	1 (3.1)	29 (20.4)	[a] 0.006
	Diabetes mellitus		66 (60.0)	22 (68.8)	88 (62.0)	[a] 0.370
	Hypertension		42 (38.2)	12 (37.5)	54 (38.0)	[a] 0.944
	Chronic kidney disease		14 (12.7)	2 (6.3)	16 (11.3)	[c] 0.525
	Malignancy/leukemia		9 (8.2)	1 (3.1)	10 (7.0)	[c] 0.456
	Chronic liver disease		4 (3.6)	0 (0.0)	4 (2.8)	[c] 0.575
	*Others		25 (22.7)	6 (18.8)	31 (21.8)	[a] 0.632
Clinical parameters	Level of consciousness (GCS)	Mean ± SD	11.26 ± 4.61	15.0	12.11 ± 4.35	[b] 0.001
	Oxygen saturation	Mean ± SD	92.76 ± 10.01	97.25 ± 3.12	93.77 ± 9.11	[b] 0.001

GCS: Glasgow Coma Scale

[a] Chi-square test, [b]Mann Whitney U test, [c]Fisher exact test was done. Data was presented as mean ± SD, frequency (percentage); *Others includesleukaemia, aplastic anaemia, psoas abscess, cellulites, diabetic foot with gangrene.

	Need for oxygen	Yes	75 (68.2)	1 (3.1)	76 (53.5)	[a]0.001
		No	35 (31.8)	31 (96.9)	66 (46.5)	
Laboratory parameters	White blood cell count (cumm)	Mean ± SD	18129.62 ± 9035.20	12834.38 ± 4980.65	16936.32 ± 8572.71	[b] 0.001
	Serum lactate (mmol/L)	Mean ± SD	8.39 ± 9.92	1.46 ± 0.92	6.83 ± 9.20	[b] 0.001
GCS: Glasgow Coma Scale						
[a] Chi-square test, [b]Mann Whitney U test, [c]Fisher exact test was done. Data was presented as mean ± SD, frequency (percentage); [*]Others includesleukaemia, aplastic anaemia, psoas abscess, cellulites, diabetic foot with gangrene.						

Source of infection

The most common sources or causes of infection among patients with sepsis were pneumonia (39/110, 35.5%), urinary tract infection (37/110, 33.6%) and dengue (12/110, 10.9%). Other causes included neutropenic sepsis, liver abscess, infective endocarditis, melioidosis, leptospirosis, meningitis/encephalitis, septic arthritis, malignancy, enteric fever and spontaneous bacterial peritonitis (Fig. 2).

Comparison of qSOFA, MEWS and NEWS

The mean qSOFA, MEWS, and NEWS scores in the sepsis group were 1.8 ± 0.76, 7.49 ± 2.30, and 11.28 ± 3.33 respectively (Table 2), whereas in the non-sepsis group, the corresponding values were 0.34 ± 0.55, 4.13 ± 1.10, and 4.44 ± 2.18. Patients with sepsis had significantly higher scores across all evaluated scoring systems compared to those without sepsis (p value: 0.001), indicating that these scoring systems effectively differentiate sepsis from non-sepsis cases.

Table 2
Comparison of different scores among patients with or without sepsis and death vs survived

Parameters		**qSOFA**	**MEWS**	**NEWS**
Sepsis	Yes (n = 110)	1.8 ± 0.76	7.49 ± 2.30	11.28 ± 3.33
	No (n = 32)	0.34 ± 0.55	4.13 ± 1.1	4.44 ± 2.18
	P value	0.001	0.001	0.001
Mortality	Yes/ Death (n = 58)	2.1 ± 0.74	8.67 ± 2.27	12.72 ± 3.05
	No/ Survived (n = 52)	1.46 ± 0.64	6.19 ± 1.48	9.67 ± 2.87
	P value	0.001	0.001	0.001
qSOFA: Quick Sequential Organ Failure Assessment; NEWS: National Early Warning Score; MEWS: Modified Early Warning Score.				
Mann Whitney U test was done. Data was presented as Mean ± SD.				

Among the 110 patients with sepsis, 58 (52.7%) patients did not survive. All three scoring systems, qSOFA, MEWS, and NEWS, were significantly associated with mortality, with higher mean values in patients who died. Statistical analysis confirmed these differences were significant (p value: 0.001), highlighting the utility of each score in stratifying risk of mortality among sepsis patients.

Diagnostic and Prognostic Performance

For sepsis diagnosis, NEWS had the highest AUC (0.953, 95% CI 0.914–0.991), followed by qSOFA (0.919, 95% CI 0.866–0.971) and MEWS (0.917, 95% CI 0.872–0.963). At the optimal cut-off values, qSOFA ≥ 1.0 had the highest sensitivity (97.27%) but lower specificity (68.75%), whereas NEWS ≥ 8.0 provided the best balance of sensitivity (88.18%) and specificity (90.62%). DeLong testing showed no statistically significant difference between qSOFA and MEWS (p = 0.961), MEWS and NEWS (p = 0.1045), or NEWS and qSOFA (p = 0.098) (Table 3 **and** Fig. 3A).

Table 3
Comparison of ROC analysis of qSOFA, MEWS, NEWS Scoring System to predict sepsis and mortality of patients suffering from sepsis

Parameter		Area under curve with 95% confidence interval	Cut off value	Sensitivity	Specificity	Positive predictive value	Negative predictive value	Accuracy
Sepsis	qSOFA	0.919 (0.866–0.971)	≥ 1.0	97.27	68.75	91.45	88.00	90.85
	MEWS	0.917 (0.872–0.963)	≥ 6.0	80.91	87.50	95.70	57.14	82.39
	NEWS	0.953 (0.914–0.991)	≥ 8.0	88.18	90.62	97.00	69.05	88.73
Mortality	qSOFA	0.729 (0.636–0.823)	≥ 2.0	81.03	53.85	66.20	71.79	68.18
	MEWS	0.820 (0.742–0.897)	≥ 8.0	67.24	80.77	79.59	68.85	73.64
	NEWS	0.762 (0.673–0.850)	≥ 13.0	56.90	84.62	80.49	63.77	70.00

qSOFA: Quick Sequential Organ Failure Assessment; NEWS: National Early Warning Score; MEWS: Modified Early Warning Score

For mortality prediction among patients with sepsis, MEWS had the highest AUC (0.820, 95% CI 0.742–0.897), followed by NEWS (0.762, 95% CI 0.673–0.850) and qSOFA (0.729, 95% CI 0.636–0.823). qSOFA ≥ 2.0 had the highest sensitivity (81.03%) but relatively low specificity (53.85%). NEWS ≥ 13.0 had the highest specificity (84.62%) but the lowest sensitivity (56.90%). MEWS ≥ 8.0 showed the highest overall accuracy (73.64%). DeLong

testing showed that MEWS significantly outperformed qSOFA (p = 0.0391), whereas MEWS versus NEWS (p = 0.1571) and NEWS versus qSOFA (p = 0.424) were not statistically significant (Table 3**and** Fig. 3B).

Discussion

The study participants' demographic and clinical characteristics are consistent with previous literature, which shows that older age, male sex, and comorbidities like smoking are related with an increased risk of sepsis [21]. Patients with sepsis demonstrated characteristic physiological abnormalities such as increased respiratory and pulse rates, fever, hypotension, low GCS and oxygen saturation, which are indicative of a systemic inflammatory response and circulatory impairment [22, 23, 24]. The laboratory data support the clinical diagnosis, with sepsis patients exhibiting significantly raised white blood cell counts and serum lactate levels, both of which are known indicators of infection and tissue hypoperfusion [25]. These findings are consistent with Sepsis-3 guidelines, which use organ dysfunction and biochemical evidence of systemic compromise as diagnostic criteria [1].

This study assessed the diagnostic and prognostic efficacy of three prevalent scores—qSOFA, MEWS, and NEWS—in detecting sepsis and forecasting death among hospitalized sepsis patients, aiming for prompt identification and enhanced outcomes in a resource-constrained environment such as Bangladesh. This study demonstrated that all three scoring systems—qSOFA, MEWS, and NEWS, successfully differentiated sepsis from non-sepsis cases. NEWS demonstrated the highest diagnostic accuracy, exhibiting an appropriate balance of sensitivity and specificity, although the differences among the three scores were not statistically significant. In predicting mortality among sepsis patients, MEWS demonstrated superior performance and significantly exceeded qSOFA. qSOFA (≥ 1.0) has high sensitivity but low specificity, leading to overidentification of sepsis. This can burden the healthcare system and expose patients to potentially harmful antibiotics or interventions. Overall, all three tools performed well, but their sepsis diagnostic ability was statistically comparable. The best balance of sensitivity and specificity of NEWS, making it the most reliable diagnostic tool of the three.

It has been found that, when used in emergency departments, NEWS was found to be strongly linked with 30-day mortality and poor outcomes (hospital admission and length of stay) [26, 27]. Furthermore, NEWS and MEWS were more accurate in predicting death and ICU transfer in patients with probable infection than qSOFA [16].The higher performance of NEWS might be in large part due to its inclusion of more physiological data, particularly oxygen saturation and supplementary oxygen use, important indicators in sepsis-related respiratory compromise. While qSOFA and MEWS do not include oxygen-related metrics in their clinical evaluations, NEWS is able to do so, allowing it to spot early indicators of deterioration. Consistent with our results, Brunetti et al. found that qSOFA has poor specificity but high sensitivity; however, their study also found that qSOFA has a high false positive rate, which raises concerns about its utility as a diagnostic tool and suggests that it may be better used as a "red flag" indicator to identify susceptible patients[29]. When faced with such circumstances, clinical judgment ought to take precedence. Doctors should evaluate the patient's general condition, including symptoms and any age-related concerns, before determining the next stages in diagnosis and treatment. They also reported that, the MEWS and NEWS scores, which are more intricate and time-consuming, do not clearly outperform the simpler qSOFA [28]. While the Early Warning Scores were not originally designed to be sepsis-specific, they are now being used more and more as a sepsis screening tool in both in-hospital and out-of-hospital settings. Research has compared the efficacy of SIRS, qSOFA, and NEWS in detecting sepsis and predicting mortality [16, 28]. However, similar to our findings, several authors have advocated for the use of Early Warning Scores (MEWS and NEWS) to identify septic patients with greater accuracy [16, 29, 30]. Furthermore, a systematic review and meta-analysis found that NEWS

independently had strong diagnostic potential for sepsis [31]. The National Health Service England has largely embraced the NEWS of ≥ 5 as a trigger for probable sepsis [32], which is also similar to the findings of Pairattanakorn et al. [33]. In this study, NEWS (≥ 8.0) demonstrated the highest diagnosis accuracy. The observed variance is most likely due to differences in population characteristics, treatment settings, and sepsis clinical criteria. This emphasizes the significance of local validation of sepsis scoring systems prior to their general use in clinical practice.

The mean qSOFA score was markedly elevated in non-survivors compared to survivors, signifying a heightened degree of organ impairment in patients who did not survive. Correspondingly, MEWS and NEWS scores were markedly elevated in the non-survivor group, indicating greater physiological deterioration. The area under the curve (AUC) for MEWS (≥ 8.0) was the highest, followed by NEWS (≥ 13.0) and qSOFA (≥ 2.0), signifying that MEWS is a more dependable scoring system for predicting mortality in sepsis patients. Pairwise comparisons of the ROC curves indicate that MEWS significantly outperformed qSOFA. Similar to the findings of our study, Majmundar et al. [34] found that MEWS ≥ 5 score had the strongest potential to predict ICU mortality when compared to NEWS ≥ 5, qSOFA ≥ 2, and SIRS ≥ 2. There was a difference in the cutoff point though. Conversely, Farzand et al.[35] indicated that NEWS exhibited enhanced predictive accuracy for in-hospital mortality (AUROC: 0.873) and ICU admission (AUROC: 0.890) relative to MEWS, qSOFA, and SIRS, concluding that NEWS is the most efficacious instrument for early risk stratification in sepsis patients. They conclude that its implementation could markedly improve sepsis management and outcomes in resource-limited emergency rooms. Comparable findings were also reported by Wattanasit and Khwannimit [36].

Our results also highlight the significance of clinical context, where NEWS may be preferable for early detection and triage in emergency environments, MEWS may be more appropriate for mortality prediction in ICU or inpatient settings. Consequently, although each scoring system possesses distinct advantages, their effectiveness may differ based on the healthcare environment (primary vs tertiary), demographic attributes, and time of application.

This study presents a number of limitations. The scoring systems were utilized solely at the point of admission, failing to account for any dynamic changes in patient condition or fluctuations in scores over time. This restricts the capacity to assess the predictive significance of score trends over the duration of the illness. Secondly, the diagnosis of sepsis relied on clinical judgment utilizing SIRS criteria and serum lactate levels, which could have led to misclassification bias, especially in borderline or atypical cases. Third, the study took place in a single tertiary care hospital and utilized a consecutive sampling method with a relatively small sample size. This approach may restrict the applicability of the findings to other contexts, particularly in primary care or rural hospitals. Finally, the evaluation did not include long-term outcomes like post-discharge complications, readmissions, and mortality, which limits the assessment of prognosis beyond the hospital stay.

Limitations

This study has several limitations. First, qSOFA, MEWS and NEWS were calculated only at admission; dynamic changes in scores over time were not evaluated. The study was conducted at a single tertiary care centre with a relatively small sample size and used consecutive sampling, limiting generalisability to primary care, rural hospitals, and other LMIC settings. Finally, long-term outcomes such as post-discharge complications, readmissions and late mortality were not assessed.

Conclusion

Advanced age, male gender, and a smoking history were all significantly associated with a higher rate of sepsis. The qSOFA, MEWS, and NEWS scores exhibited significant disparities between sepsis and non-sepsis groups, as well as between survivors and non-survivors, hence affirming their efficacy in detecting sepsis and forecasting in-hospital mortality. The NEWS is more suitable for early detection of sepsis, whereas the MEWS is better aligned with mortality prediction in ICU and inpatient settings. However, the selection of a scoring method must be guided by the clinical setting, available resources, and specific objectives, whether it for early identification or mortality risk evaluation. This study emphasizes the necessity of locally validating sepsis scoring systems to improve their relevance across various healthcare environments. To overcome these constraints, additional multicenter studies with bigger sample sizes and prolonged follow-up are advised, especially in LMIC settings.

Abbreviations

AUC
area under the curve
AVPU
Alert, Voice, Pain, Unresponsive
CI
confidence interval
GCS
Glasgow Coma Scale
ICU
intensive care unit
LMIC
low- and middle-income country
MEWS
Modified Early Warning Score
NEWS
National Early Warning Score
qSOFA
quick Sequential Organ Failure Assessment
ROC
receiver operating characteristic
SIRS
systemic inflammatory response syndrome
SOFA
Sequential Organ Failure Assessment
SpO2
peripheral oxygen saturation
WBC
white blood cell.

Declarations

Ethical approval and consent to participate

Ethical approval was obtained from the Institutional Review Board of Bangabandhu Sheikh Mujib Medical University (reference: BSMMU/2023/3008). Written informed consent was obtained from all participants before enrolment.

Consent for publication

Not applicable

Data availability

All dataset files are available in the public domain under the CC BY 4.0 license agreement from the Figshare database. DOI- https://doi.org/10.6084/m9.figshare.32685126

(Database can be accessed via this link).

Declaration of competing interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Author contributions

[SS]: Conceptualization, methodology, investigation, data curation, formal analysis, visualization, writing - original draft.

[TBH, IA, MRA]: Methodology, investigation, data curation, writing - review and editing.

[MA, MSR, MAR, HK]: Investigation, resources, project administration, writing- review and editing.

[FRC, MRA]: Supervision, methodology, validation, writing - review and editing.

[SS, FRC, TBH]: Conceptualization, supervision, validation, project administration, writing - review and editing.

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Figures

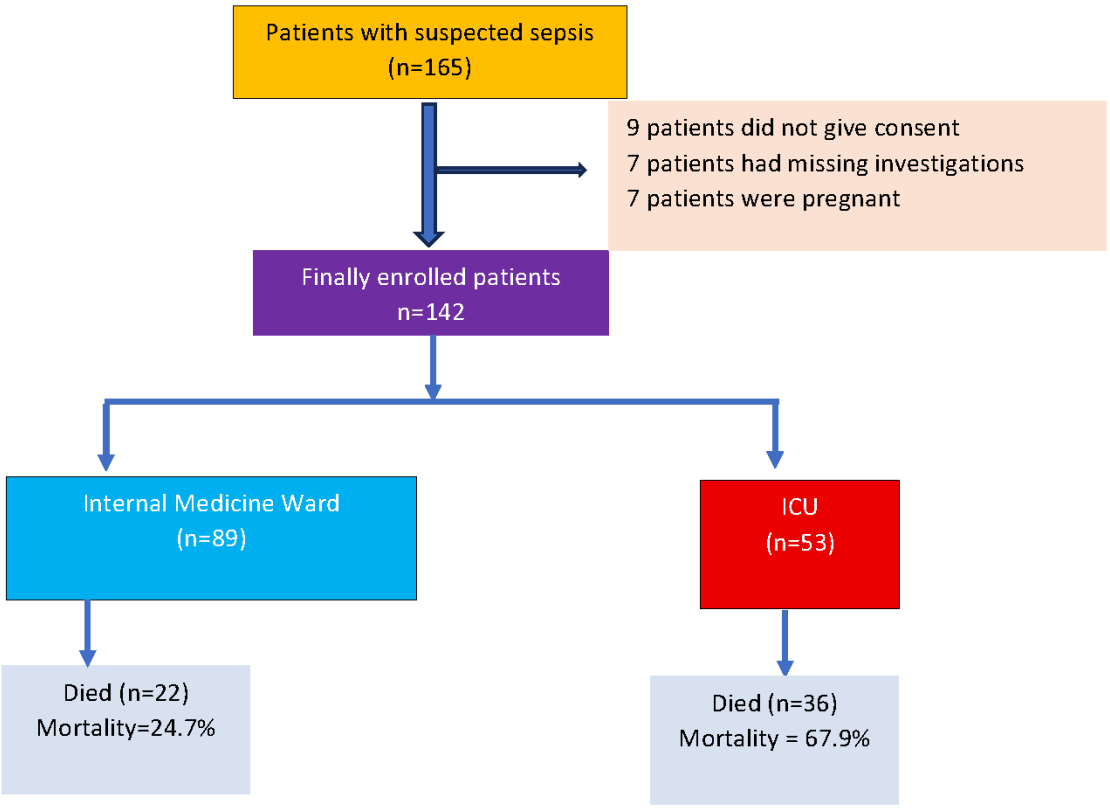


Figure 1

Participant enrolment and outcome flow

The flow diagram shows screening, exclusions, enrolment, clinical location and mortality among the 142 included participants.

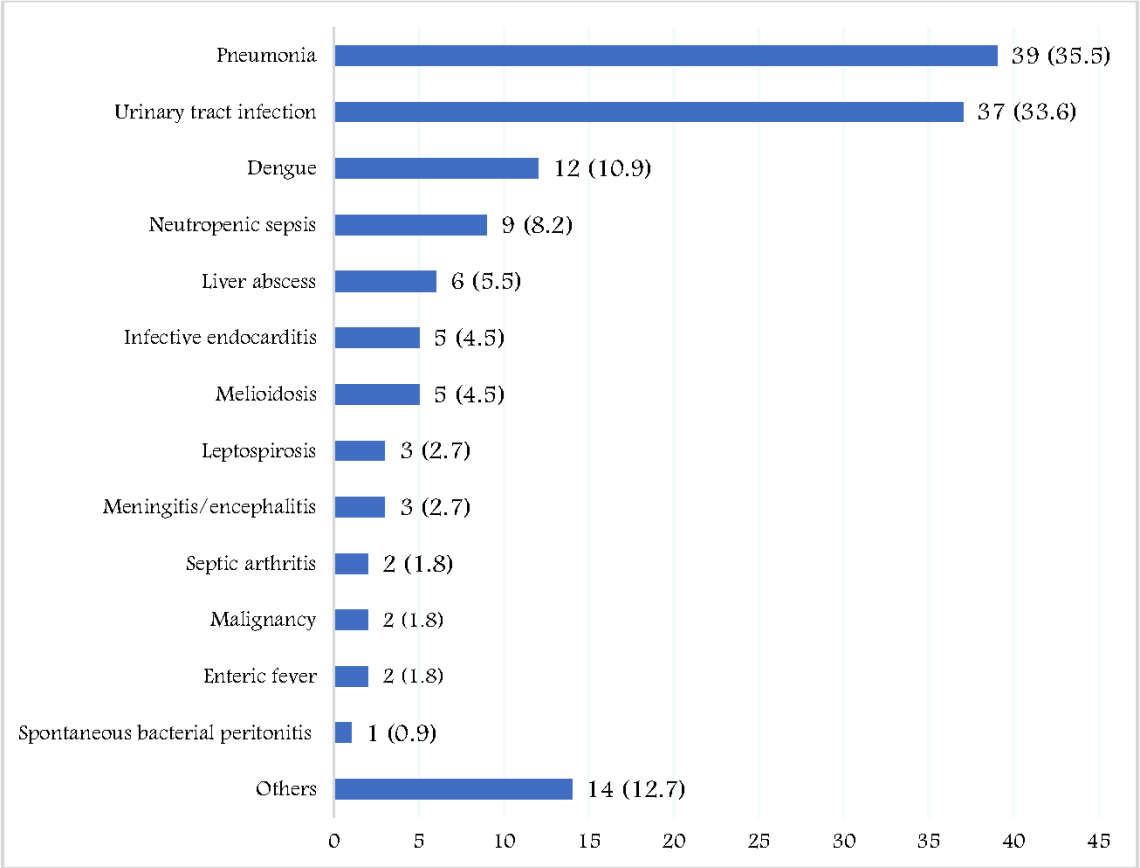


Figure 2

Sources of infection among patients with sepsis

Distribution of reported sources or causes of infection among 110 patients with sepsis. Multiple responses were permitted.

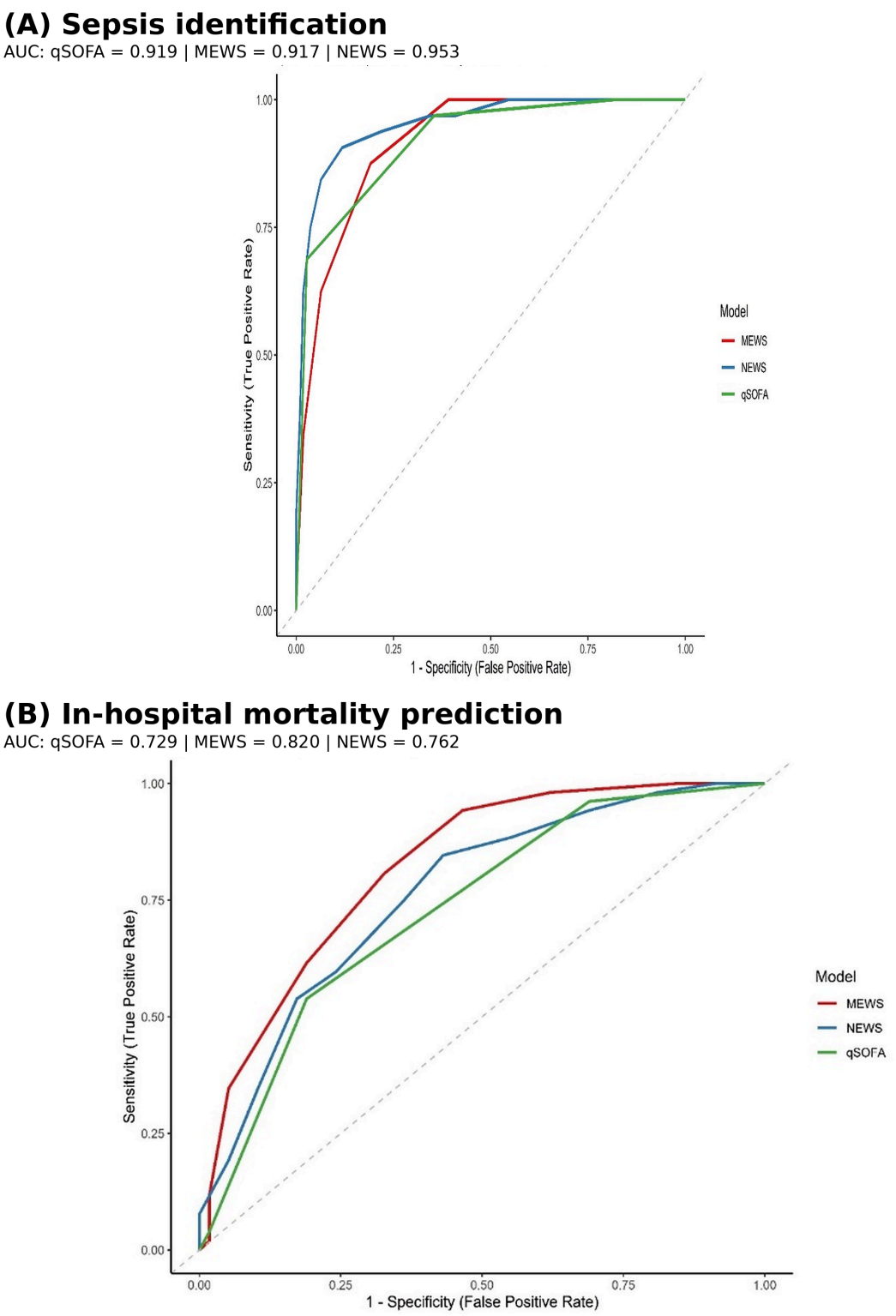


Figure 3

ROC curves for sepsis diagnosis and mortality prediction

Receiver operating characteristic curves comparing qSOFA, MEWS and NEWS for (A) sepsis identification and (B) in-hospital mortality prediction among patients with sepsis. MEWS, Modified Early Warning Score; NEWS, National Early Warning Score; qSOFA, quick Sequential Organ Failure Assessment; ROC, receiver operating characteristic.

Supplementary Files

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