Outcomes of Evidence-Based Modified Sepsis Protocol in an Emergency Department in Tanzania

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INTRODUCTION & BACKGROUND

- Sepsis, the most common reason for hospitalization is among top five causes of death in Tanzania.
- Sepsis-related mortality is **47.2%** in Africa vs. **13.1%** in North America (global ICU audit).
- Knowledge gaps related to initial nursing assessment delays early identification of sepsis.
- Lack of standardized sepsis protocol, clinical staffing shortages, and material resources are additional barriers causing delayed identification and treatment of sepsis in Tanzania.

PURPOSE & AIMS

- The purpose of this quality improvement project was to implement a standardized modified-sepsis protocol in the emergency department at a hospital in Tanzania.
- The project had four aims:

i. To assess the compliance of using the sepsis screening tool and protocol and the time to diagnose sepsis or septic shock (time zero) before and after the implementation among clinicians.
ii. To determine the average lengths of hospital stay from before and after project implementation.
iii. To determine the number of sepsis-related deaths from before and after project implementation.
iv. To establish the feasibility of using the modified-sepsis screening tool and protocol among clinicians after 12 weeks of implementation.

METHODS

- **Pre-post intervention design** over 12 weeks in adult patients of **18 and over**
- Pre-intervention: retrospective chart review using ICD-10 codes for sepsis/septic shock (December 2019 to February 2020)
- Intervention: patients presented to A&E with signs of sepsis/septic shock (September 2020 to January 2021)
- **Adapted-Modified Sepsis Protocol** included patients who met:
  - two of four SIRS criteria, **AND**
  - one or more of clinical characteristics or high risk indicators for sepsis
- Twenty-five Clinicians for **feasibility survey** (RNs, RMOs, physicians, clinical manager)
- Patient demographics & differences between pre and post-protocol groups were analyzed

INTERVENTION

Established a **sepsis committee** and created a **modified-sepsis screening tool and protocol** based on Surviving Sepsis Campaign (SSC) guidelines

Education of interprofessional team and **implementation** of the modified-sepsis screening tool and protocol

A **short 9-item survey questionnaire** administered to all the clinicians to assess their perceptions and **feasibility** of the protocol

RESULTS

Table 1: Bundle Parameters and Compliance with Sepsis Protocol

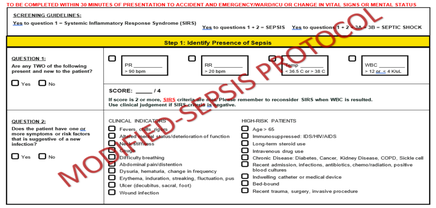
	Pre-Protocol (n=48)	Protocol (n=78)	*p*
Parameters of Sepsis Bundle Compliance n (%)			
Serum lactate	8 (16.7)	17 (21.8)	0.483
Blood culture	11 (22.9)	13 (16.7)	0.386
Intravenous fluid	29 (60.4)	38 (48.7)	0.201
Intravenous antibiotic	27 (56.3)	34 (43.6)	0.167
Vital signs reassessment	**40 (83.3)**	**75 (96.2)**	**0.013***
Chest x-ray	**18 (37.5)**	**49 (62.8)**	**0.006***
Time to Identify and Treat (Min) Median (IQR)			
Time sepsis diagnosed	**0~**	**17.50 (56.0)**	-
Compliance Category n (%)			
Fully compliant	3 (6.3)	3 (3.8)	0.522
Partially compliant	**38 (79.2)**	**73 (93.6)**	**0.013***
Non-compliant	**7 (14.6)**	**2 (2.6)**	**0.011***

** p value <0.05*
~none of the patients in the pre-protocol group have this information documented.

Table 2: Hospital Lengths of Stay and Mortality

	Pre-Protocol (n=48)	Protocol (n=78)	*p*
Median (IQR)			
Hospital length of stay (Days)	**4.00 (4.75)**	**3.00 (6.25)**	**0.788**

	Pre-Protocol (n=48)	Protocol (n=78)	*p*
Mortality n (%)			
Mortality with sepsis/septic shock	**9 (18.7)**	**9 (11.5)**	**0.263**



RESULTS

Figure 1: Feasibility Survey on Understanding of Sepsis Protocol

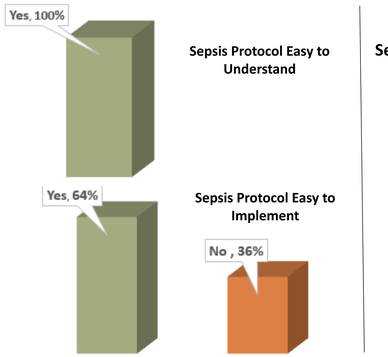
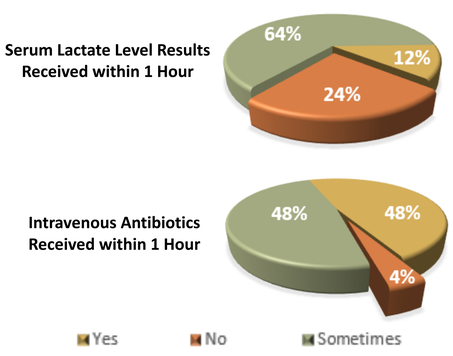


Figure 2: Feasibility Survey on Barriers with Sepsis Protocol



DISCUSSION & SUSTAINABILITY PLAN

- Our QI project shows that an adapted modified-sepsis protocol can be implemented in resource-restricted setting with a **statistically significant improvement in compliance with following the protocol.**
- We saw **positive trends towards reduction in hospital lengths of stay and sepsis-related mortality**.
- We also noted **meaningful clinical improvement in practice patterns with reassessment of vital signs, diagnostic chest x-rays, and time to identify patients with sepsis** in the post-protocol group.
- Clinicians' **understanding and willingness to impalement the protocol** in the emergency department was also noted.
- The institution plans to make this protocol a **Standard of Care**.
- Identifying barriers such as human and material resources – shortage of clinical staff, turn around time for serum lactate level, and the associated cost of tests will help ensure successful adaptation of sepsis protocols.

CONCLUSION

- We were able to **successfully implement a modified-sepsis protocol in resource-restricted setting**.
- Further research is warranted for most cost-effective measures to reduce sepsis-related mortality.

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