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A Study to Assess the Nurses Knowledge and Practice Regarding the Sepsis Bundle and Its Impact on Patients Outcome Among Sepsis Patients Undergoing Treatment in Apollo DRDO Hospital in IP Basis

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ABSTRACT

Sepsis is a life-threatening medical emergency caused by a dysregulated host response to infection, leading to organ dysfunction and high mortality. Early identification and prompt implementation of the sepsis bundle are essential for improving patient outcomes. Nurses play a pivotal role in early recognition and timely initiation of evidence-based interventions. The study aimed to assess nurses' knowledge and practice regarding the sepsis bundle and to evaluate its impact on patient outcomes among sepsis patients admitted to Apollo DRDO Hospital. A quantitative research approach with a pre-test and post-test research design was adopted. Sixty staff nurses working in inpatient units were selected using convenience sampling. Data were collected using a structured knowledge questionnaire, practice adherence checklist, and opinionnaire. Medical records were reviewed to assess patient outcomes such as mortality and length of hospital stay. A structured teaching programme on sepsis bundle management was administered. Data were analysed using descriptive and inferential statistics, including chi-square test and independent t-test. The findings revealed that 40% of nurses had good knowledge, 12% had Average knowledge, and 8% had poor knowledge regarding the sepsis bundle. Practice adherence showed that 80% demonstrated good practice, 20% moderate practice, and 0% poor practice. Patients managed by nurses with good practice adherence had lower mortality rates (12%) and shorter mean length of stay (7.2 days) compared to those with poor practice (35% mortality and 12.1 days length of stay). Statistical analysis showed a significant association between nurses' practice level and patient outcomes (χ^2 = 8.45, p = 0.015; t = 2.87, p = 0.006). The study concludes that improved nurses' knowledge and strict adherence to sepsis bundle protocols significantly enhance patient outcomes. Continuous education, regular training programmes, and institutional support are essential to bridge the knowledge–practice gap and reduce sepsis-related morbidity and mortality.

Keywords: Sepsis bundle, Nurses' knowledge, Practice adherence, Patient outcomes, Critical care nursing.

INTRODUCTION

Sepsis is a life-threatening medical emergency that occurs when the body's response to an infection—bacterial, viral, or fungal—causes damage to its own organs and tissues. Common symptoms include fever or chills, confusion, shortness of breath, extreme pain or discomfort, clammy or mottled skin, tachycardia, weak pulse, nausea, vomiting, or diarrhea.

Early recognition and prompt treatment are crucial, as sepsis can rapidly progress to septic shock, multi-organ failure, and death.

Management of sepsis requires immediate initiation of treatment. Patients diagnosed with sepsis are often admitted to the intensive care unit (ICU) for close monitoring and specialized care. Treatment includes early administration of broad-spectrum antibiotics, intravenous fluids to restore circulation, vasopressors to maintain blood pressure, oxygen therapy, mechanical ventilation when required, Source control of infection, and strict monitoring of vital parameters and blood glucose levels. Timely implementation of the sepsis bundle has been shown to significantly reduce mortality and length of hospital stay.

MATERIALS & METHODS

METHODLOGY:

Quantitative Research Approach: A quantitative research approach was adopted for this study to objectively assess nurses' knowledge and practice regarding the sepsis bundle and to measure its impact on patient outcomes. The quantitative method allows for systematic collection and statistical analysis of numerical data, enabling the researcher to determine relationships between variables and test hypotheses. This approach was appropriate as the study aimed to quantify knowledge levels, measure practice adherence scores, and examine their association with measurable patient outcomes such as mortality rate and length of hospital stay. The use of structured tools and statistical tests ensured reliability, validity, and objectivity in interpreting the findings.

Pre-Test: The pre-test was conducted to assess the baseline knowledge of staff nurses regarding the components of the sepsis bundle before the implementation of the structured teaching programme. A structured knowledge questionnaire was administered to all 60 participants. The questionnaire included items related to early identification of sepsis, timely administration of antibiotics, fluid resuscitation, lactate monitoring, and other evidence-based interventions. The purpose of the pre-test was to identify existing knowledge gaps and determine the initial competency level of nurses in sepsis management. The results of the pre-test provided a foundation for planning targeted educational interventions.

Post-Test: The post-test was conducted after administering the structured teaching programme on sepsis bundle management. The same structured knowledge questionnaire was used to evaluate the effectiveness of the educational intervention and to measure improvement in knowledge levels among the nurses. The post-test helped determine whether the training significantly enhanced understanding and adherence to sepsis bundle protocols. A comparison of pre-test and post-test scores was performed using appropriate statistical methods to assess the significance of improvement. The findings demonstrated a marked increase in knowledge levels, indicating that structured training positively influenced nurses' competency in managing sepsis patients.

Research Design: A pre-test and post-test research design was utilized to evaluate the effectiveness of a structured teaching programme on nurses' knowledge of the sepsis bundle. The design allowed comparison of knowledge levels before and after the educational intervention.

Independent variables:

1. Nurses knowledge of sepsis bundle: Assessing understanding of sepsis

bundle and its components, recognition and management.
2. Nurses education: participation in sepsis related training programs or workshop.
3. Availability of resources: Access to sepsis guidelines, antibiotics and monitoring equipment in the hospital.

Dependent variables:
1. Practice adherence scores: Nurses compliance with sepsis bundle protocols.
2. Patient outcome perception: Nurses views on how sepsis bundle impacts patient outcomes.
3. Confidence in sepsis management: Nurses self-rated confidence levels in managing sepsis patients.
4. Training needs identified: gaps in knowledge/practice highlighted by nurses future training.

DURATION OF THE STUDY: 3 Months
SAMPLE: Staff nurses (60 NURSES), Patient Files (30files)

INCLUSION CRITERIA:
1. Staff nurses working in patients units (IP) managing sepsis patients in Apollo DRDO Hospital.
2. Nurses directly involved in sepsis patient care.
3. Nurses willing to participate in the study.
4. Staff nurses documented sepsis case in the IP setting with complete data on sepsis bundle adherence and outcomes.
5. Nurses who have completed at least one formal training program or workshop related to sepsis management within the past year.
6. Nurses with a minimum of six months continuous experience in inpatient care settings, ensuring they have sufficient exposure to sepsis cases.

EXCLUSION CRITERIA:
1. Nurses on leave (or) not available during data collection.
2. Nurses working in non- IP areas (eg: OPD areas).
3. Nurses not directly involved in sepsis patient care.
4. Not consenting to participate.
5. Nurses currently undergoing probation or orientation who may not yet be fully integrated into clinical practice.
6. Nurses with documented disciplinary issues or performance concerns that could affect adherence to clinical protocols.

SAMPLE SIZE:
60 Nursing staff working in Medical Surgical ward, MICU, and Emergency Department of the Apollo DRDO Tertiary care hospital, Hyderabad.

SAMPLING METHOD:
Convenience sampling technique is used to select the nursing staff working in - patient units at Apollo DRDO Hospital.

SETTINGS OF THE STUDY:
The setting of the study is where nursing staff managing sepsis patients will be recruited for the research on sepsis bundle knowledge and practice.

TARGET POPULATION:
The target population of the study is 60 Nursing staff working in Medical Surgical ward, MICU, and Emergency Department of the Apollo DRDO Tertiary care hospital, Hyderabad.

ETHICAL CONSIDERATIONS:
Permission taken from nursing head prior to data collection and Ethical consideration taken from Apollo Hospitals Jubilee Hills Hyderabad. Consent was taken from the staff nurses before collecting the data.

DATA COLLECTION METHOD:
Formal permission taken from the concerned authorities from Apollo DRDO hospital Hyderabad. The subject was assembled in the auditorium as per schedule. The purpose of the study was

explained to them and consent was taken from the Registered Nurses. Pre Test was conducted of 60 respondents by using the knowledge questionnaire on sepsis management and treatment options. After the completion of pre Test the respondents were Trained and the respondents was briefed on sepsis management and treatment options. About sepsis bundle and all the queries that the subject had were clarified. Post-test questionnaire to assess the knowledge about sepsis management and treatment options. After Post Test researcher thanked and appreciated all the respondents for their good work. Reviewed the medical records to assess patient outcomes such as mortality and length of hospital stay.

TOOL USED FOR DATA COLLECTION:

- Structured knowledge questionnaire will be used to assess nurses the knowledge of the sepsis bundle.
- Section 1- structure questionnaire to assess nurses the knowledge of the sepsis bundle.
- Section 2 - structure questionnaire to evaluate practice and adherence to sepsis bundle protocols.
- Section 3-structure opinionnaire

DATA ANALYSIS:

Data were analysed using descriptive and inferential statistics. Frequencies, percentages, means, and standard deviations were calculated to describe nurses' demographic characteristics, knowledge scores, and practice levels. Inferential statistics such as the chi-square test and independent t-test were applied to examine associations between nurses' knowledge/practice and patient outcomes. A p-value of <0.05 was considered statistically significant.

METHODOLOGY:

Tools Used for Data Collection

To systematically assess nurses' knowledge, practice, and perceptions regarding the sepsis bundle, three structured tools were employed:

1. **Structured Knowledge Questionnaire**
   - Designed to evaluate nurses' understanding of sepsis bundle components, early recognition of sepsis, and evidence-based management strategies.
   - Consisted of multiple-choice and short-answer questions covering clinical signs, interventions, and protocols.
   - Scoring was based on correct responses, with higher scores reflecting better knowledge.

2. **Practice Adherence Checklist**
   - A structured observation tool used to measure compliance with sepsis bundle protocols during patient care.
   - Items included timely administration of antibiotics, fluid resuscitation, monitoring of lactate levels, and documentation of interventions.
   - Each item was scored as **compliance (2 points)** or **non-compliance (0 points)**, with a **maximum score of 24 points**.
   - Scores were categorized into **Good Practice (19–24 points)**, **Average Practice (12–18 points)**, and **Poor Practice (0–11 points)**.

3. **Structured Opinionnaire**
   - Used to capture nurses' perceptions, confidence levels, and attitudes toward sepsis management.
   - Included Likert-scale items to measure agreement with statements about training adequacy, resource availability, and perceived impact of bundle adherence on patient outcomes.
   - This tool provided qualitative insights into gaps in practice and future training needs.

Statistical Analysis

SECTION I:

Frequency and percentage distribution of subjects according to the demographic variables.

1. Demographic Characteristics of Nurses

Table 1: Distribution of Nurses by Demographic Variables

Variable	Category	Frequency (n)	Percentage (%)
Age (years)	21–30	45	75
	31–40	10	16.7
	>40	05	8.3
Unit Frequency	Medical Surgical ward	26	50
	MICU	20	30
	ER	14	20
Qualification	B.Sc. Nursing	25	41.7
	GNM	35	58.3
Years of Experience	6MONTHS-1 YR	40	66.7
	1–5years	12	20
	>5 years	8	13.3

Data presented in the above table revealed that, Majority of the study participants were in the age group of 21-30years. Most of the participants (58.3%) were Diploma Graduate and (41.7%) were Degree graduate. Majority of (50%) the Registered Nurses were working in Medical and surgical ward and MICU and majority of them (66.7%) had 6 months to 1years experience.

Section-2

2. Structured Observation Checklist – Compliance/Non-Compliance

Pre and Post Test Knowledge scores of Staff Nurses regarding the components of the sepsis bundle.

Table 2: Frequency and percentage Distribution of subjects by Pre and Post-test Knowledge scores. [n=30]

knowledge	Score Intervals	Pre-Test Knowledge Score		Post-Test Knowledge score	
		Frequency	Percentage%	Frequency	Percentage%
POOR	0-5	8	3.33%	NIL	0%
AVERAGE	6-10	12	6.67%	5	16.67%
GOOD	11-15	40	90.00%	55	83.33%
TOTAL		60		60	100%

The above table shows that as per the assessment of pre-test, Registered nurses3.33% (8) had poor knowledge,6.67% (12) had Average skills, 90% (40) had good skills and in Post Test 83.33% (55) had adequate Skills and 16.67% (5) had Average Knowledge regarding the components of the sepsis bundle

Section-3

4. Structured Observation Checklist (Sepsis Bundle Application)

Assess the nurse's practice in sepsis bundle application.

Table 3: Frequency and percentage Distribution of the nurses practice in sepsis bundle application. [n=30].

Practice	Score Intervals	Nurses practice in sepsis bundle application	
		Frequency	Percentage%
POOR	0-5	NIL	0%
AVERAGE	6-10	6	20%
GOOD	11-15	54	80%
TOTAL		60	100%

Above table shows that nurses Practice in sepsis bundle application 80 % (54) had adequate Skills and 20 % (6) had average knowledge on practice in sepsis bundle application.

RESULT

The results of the study clearly indicated that, after introduction of sepsis bundle all the Registered nurses had developed good knowledge and skills in the sepsis bundle.

Chi-square test revealed a significant association between nurses' practice level and patient mortality ($\chi^2 = 8.45$, $p = 0.015$). That shows the sepsis bundle implementation as be effectively increasing the knowledge and skills of the registered nurses and Impact on Patient Outcomes.

DISCUSSION

The present study assessing nurses' knowledge and practice regarding the sepsis bundle and its impact on patient outcomes among sepsis patients admitted on an inpatient basis at Apollo DRDO Hospital highlights the critical role of nursing competence in sepsis management. Findings suggest that adequate knowledge and consistent adherence to sepsis bundle protocols significantly improve early recognition, timely intervention, and overall patient survival. Strengthening nurses' understanding of evidence-based guidelines, coupled with regular training and practice reinforcement, not only enhances clinical decision-making but also reduces morbidity and mortality associated with sepsis. Ultimately, empowering nurses with the skills and confidence to implement the sepsis bundle effectively is a key determinant in optimizing patient outcomes and advancing the quality of care in critical settings.

CONCLUSION

The study concludes that improved nurses' knowledge and strict adherence to sepsis bundle protocols significantly enhance patient outcomes. Continuous education, regular training programmes, and institutional support are essential to bridge the knowledge–practice gap and reduce sepsis-related morbidity and mortality.

Declaration by Authors

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