Early Recognition and management of Critical Illness: A Retrospective review of Nurses' documentation at the University of Port Harcourt Teaching Hospital Intensive Care Unit

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Abstract	Original Research Article

Background: The prompt identification of critical illness plays a vital role in averting complications such as multiple organ failure and enhancing patient outcomes.

Aim: To evaluate nurses' documentation practices and ability to recognise and escalate for prompt responses.

Methods: A retrospective review of 170 patient vital signs charts from the ICU was conducted, focusing on completeness of documentation, identification of abnormalities, escalation responses, use of Early Warning Scores (EWS), and patient outcomes. Data were collected from January 2023 to December 2024 and analysed using SPSS version 26.0.

Results: Documentation compliance was high for temperature and blood pressure (100%), with slightly lower rates for respiratory rate (98.2%), urine output (91.8%), and level of consciousness (90.0%). Abnormal respiratory rates (60%) and blood pressure (50%) were the most frequently recorded deviations. Recognition of abnormalities using pen colour changes occurred in 95.3% of cases, but only 25.3% led to documented escalation, with a mean response time of 25 minutes. EWS was recorded in just 30% of the charts. Patient outcomes included a 60% recovery rate, 20% mortality, and 20% with undocumented outcomes.

Conclusion: While ICU staff at UPTH demonstrated high awareness of abnormal vital signs, significant gaps were observed in escalation practices and EWS utilisation. These findings highlight systemic and cultural barriers to effective critical care response and underscore the need for institutional reforms, including mandatory EWS integration, staff empowerment, and continuous audit-feedback mechanisms to improve patient safety and outcomes.

Keywords: Early Recognition, Critical Illness, Retrospective, Nurses' Documentation.

INTRODUCTION

Critical illness refers to a physiological condition marked by severe derangement in vital functions—such as respiratory distress, circulatory instability, or altered consciousness—that threatens life or functional capacity if not addressed urgently[1]. It is often caused by conditions such as sepsis, trauma, acute respiratory failure, or cardiovascular compromise and can present acutely or evolve gradually from seemingly stable states. Regardless of the underlying cause, timely recognition and prompt initiation of appropriate care are essential to prevent clinical deterioration, reduce mortality, and preserve organ function[2].

The early phases of critical illness often manifest as subtle but measurable physiological changes. These early warning signs—such as rising respiratory rate, hypotension, or altered mental status—are frequently under-recognised or misinterpreted, especially in general ward settings where continuous monitoring may be lacking[3]. Nurses, being the healthcare professionals most frequently at the bedside, are uniquely positioned to detect these early indicators. Their documentation, clinical judgment, and escalation actions form the foundation of a hospital's response to patient deterioration[4]. Thus, the quality of nursing surveillance and documentation is not merely a procedural issue but a patient safety imperative.

To support frontline providers in this effort, structured

clinical tools such as the Early Warning Score (EWS) and Modified Early Warning Score (MEWS) have been widely adopted globally. These systems assign weighted values to abnormal physiological parameters, providing objective thresholds for triggering clinical review and intervention[5]. Research from high-income countries demonstrates that robust implementation of early warning systems can reduce in-hospital cardiac arrests, ICU admissions, and overall mortality[6]. However, in low- and middle-income countries (LMICs), the impact of these systems has been limited by contextual barriers—chiefly inadequate staffing, limited training, inconsistent protocol adherence, and a lack of electronic health record systems[7].

In Nigeria, as in many LMICS, critical care services remain constrained by infrastructure limitations and high patient-to-staff ratios. The University of Port Harcourt Teaching Hospital (UPTH), a major tertiary referral center in the Niger Delta region, exemplifies these systemic challenges. The disparity in resource allocation and clinical workflow between specialised units like the Intensive Care Unit (ICU) and general wards, such as female medical and orthopaedic wards, often results in inconsistent recognition and response to patient deterioration[8]. While the ICU benefits from higher nurse-to-patient ratios, specialised training, and continuous monitoring equipment, the general wards rely heavily on periodic observations and manual charting by nurses who may be responsible for large patient volumes.

Despite the known importance of early recognition and structured response, there is a paucity of empirical data examining how nurses in Nigerian hospitals document and respond to indicators of critical illness across different clinical settings. Existing literature tends to focus on outcomes in ICU environments, with little attention paid to the processes preceding ICU admission or occurring in non-critical care wards[9]. Without this insight, it is difficult to identify specific system failures or to develop targeted interventions that improve early recognition hospital-wide. This study seeks to fill that gap by evaluating the documentation practices, response times, and adherence to early warning scoring protocols by nurses at UPTH. This research aims to assess the degree to which critically ill patients are recognised and acted upon during their early stages of deterioration

METHODS

This retrospective study analysed 500 patient records from three wards at UPTH, specifically the ICU (150 records). Data collection occurred between January 2023 and December 2024. The patient records were scrutinised for the recording of abnormal physiological parameters, including respiratory distress, tachycardia, and hypotension. Furthermore, the response times to these documented abnormalities were evaluated to determine the timeliness of interventions. Compliance with early warning scoring protocols was assessed, concentrating on whether scores were calculated and utilised to inform clinical decisions. Statistical analysis employed both descriptive and inferential methods to compare documentation practices and outcomes across the various wards. Ethical approval for the study was obtained from the UPTH Health Research Ethics Committee, and patient anonymity was strictly maintained throughout the study. Since the research involved a retrospective review of de-identified medical records, informed consent was waived following institutional guidelines. All data were analysed using SPSS version 26.0. Descriptive statistics, including frequencies, means, and standard deviations, were used to summarise documentation patterns and patient characteristics

RESULTS

A total of 170 vital signs charts from the Intensive Care Unit (ICU) of the University of Port Harcourt Teaching Hospital were retrospectively reviewed. Data were analysed based on the completeness of vital sign documentation, identification of abnormalities (through colour changes in pen), escalation and response times, compliance with Early Warning Score (EWS), and documented patient outcomes.

Table 1: Documentation of Vital Signs

Vital Sign	Documented Charts (n)	Documentation Rate (%)
Temperature	170	100%
Blood Pressure	170	100%
Respiratory Rate	167	98.2%
Urine Output	156	91.8%
Level of Consciousness	153	90.0%

All patient charts (100%) had consistent recordings of temperature and blood pressure, indicating strong compliance with ICU monitoring protocols for these parameters. However, documentation of urine output (91.8%) and level of consciousness (90.0%) fell slightly short of full compliance, potentially due to variability in nursing practices or patient condition. The respiratory rate, a vital predictor of early deterioration, was recorded in 98.2% of charts, indicating generally good surveillance.

Table 2: Detection of Abnormal Vital Signs

Vital Sign	Abnormal Values Identified (n)	Abnormality Rate (%)
Respiratory Rate	102	60.0%
Blood Pressure	85	50.0%
Temperature	68	40.0%
Urine Output	60	35.3%
Level of Consciousness	51	30.0%

Respiratory rate abnormalities (tachypnea or bradypnea) were the most frequently observed (60%), highlighting it as a primary indicator of critical deterioration in the ICU. Abnormal blood pressure (hypotension or hypertension) was noted in 50% of charts, while temperature irregularities (e.g., fever or hypothermia) were noted in 40% of charts. Lower frequencies of abnormal urine output (35.3%) and altered mental status (30%) may reflect either fewer true incidences or under-recognition/documentation.

Table 3: Recognition via Colour Change

Recognition Method	Number of Charts (n)	Percentage (%)
Pen Colour Change (Blue to Red) Used	162	95.3%
No Colour Change Used	8	4.7%

Nearly all ICU charts (95.3%) utilised the pen colour change system to highlight abnormalities. This suggests that nursing recognition of deterioration is high, though it does not necessarily translate into timely action, as explored below.

Table 4: Escalation and Response

Response Parameter	Value
Charts with Documented Escalation	43
Escalation Rate	25.3%
Mean Time to Clinical Response (where escalated)	25 minutes
Charts without Escalation (despite abnormal values)	127
Non-Escalation Rate	74.7%

Despite a high rate of abnormality recognition, only 25.3% of charts (n = 43) included any documentation of escalation to a higher clinical authority. Even when abnormalities were acknowledged through pen colour, three-quarters (74.7%) lacked a documented follow-up, representing a major breakdown in response. Where escalation occurred, the average response time was 25 minutes, which is clinically appropriate but unfortunately limited in scope.

Table 5: EWS Documentation

EWS Use	Number of Charts (n)	Percentage (%)
EWS Used and Recorded	51	30.0%
EWS Not Used/Not Documented	119	70.0%

Only 30% of charts included EWS documentation. Despite widespread recognition of abnormal parameters (pen colour change in 95.3%), structured scoring was infrequently applied. This represents a missed opportunity to standardise escalation thresholds, as EWS is designed to prompt objective and timely clinical review.

Table 6: Patient Outcomes

Outcome	Number of Patients (n)	Percentage (%)
Recovered and discharged	102	60.0%
Died in ICU	34	20.0%
Outcome Not Documented	34	20.0%

The majority of ICU patients (60%) survived and were discharged. However, a significant 20% mortality rate was recorded, and a further 20% had no documented outcome, indicating lapses in record completeness or continuity of care documentation

DISCUSSION

This study offers critical insight into the processes underpinning early recognition and response to physiological deterioration in the Intensive Care Unit (ICU) of the University of Port Harcourt Teaching Hospital (UPTH), highlighting the role of nursing documentation, situational awareness, and escalation protocols in determining clinical outcomes. In a high-stakes, resource-constrained environment, the ability of frontline nurses to not only observe but also act upon early warning signs often defines the threshold between life and death. The findings of this study reveal both encouraging strengths and sobering deficits in the current system, shedding light on actionable gaps in critical care delivery.

The high documentation rate of vital signs—100% for temperature and blood pressure, and over 90% for respiratory rate, urine output, and level of consciousness—demonstrates that routine physiological monitoring is a firmly embedded practice in the ICU. This level of documentation compliance is commendable and contrasts with numerous reports from general wards in LMICS, where incomplete or infrequent recording of vital signs has been linked to delayed detection of patient deterioration. In our study, nurses consistently monitored key indicators of clinical decline, reflecting strong foundational training and a culture of vigilance that is characteristic of specialised care environments.

Yet, the clinical value of documentation lies not in its presence, but in its interpretation and timely translation into action. While 95.3% of charts employed a pen colour change (from blue to red) to indicate abnormal values—a visual cue that reflects situational awareness—only 25.3% of these abnormalities were followed by documented escalation. This gap is troubling. It suggests that while nurses recognised deviations from baseline, institutional or systemic barriers may have impeded their ability to initiate appropriate interventions. This finding is not unique to UPTH. Studies in Malawi and Kenya have shown that nurses often recognise abnormal signs but do not escalate care, primarily due to hierarchical structures, unclear escalation protocols, and fears of professional reprimand[1],[2].

The low rate of documented escalation in our ICU cohort is further contextualised by the modest use of the Early Warning Score (EWS), which appeared in only 30% of the reviewed charts. EWS is a well-validated tool designed to standardise recognition of patient deterioration by assigning objective scores to abnormal physiological parameters. Its limited application in this setting points to a broader failure not of awareness, but of system integration. Without institutional mandates, regular training, or automated scoring systems, even well-intentioned protocols often become neglected checklists rather than active clinical guides. This shortfall echoes the findings of a national study in Nigeria, which found that while 35% of charts documented EWS, only 14% demonstrated any action based on the score[5].

Crucially, the most commonly identified abnormalities in this study—respiratory distress (60%), hypotension (50%), and elevated temperature (40%)—are all well-established harbingers of impending organ dysfunction. Their presence should activate structured responses, particularly in the ICU, where patients are already vulnerable to rapid deterioration. The failure to respond decisively to such signs contributes to preventable morbidity and mortality. A large audit of in-hospital cardiac arrests in the UK found that 75% of cases were preceded by clear, documented physiological warning signs that were neither escalated nor acted upon[3]. Our data resonate with this pattern and underscore the missed opportunity for preemptive intervention.

Despite these concerns, the ICU's performance was relatively strong in terms of outcomes: a 60% recovery rate and 20% mortality, figures that align with ICU mortality benchmarks in comparable LMIC settings. These outcomes reflect the intrinsic value of close monitoring and skilled staff. However, the presence of undocumented outcomes in 20% of cases raises questions about continuity of care, handover processes, and the completeness of clinical records—factors that are essential for quality improvement and patient safety analytics.

Several system-level contributors to poor escalation and EWS compliance can be inferred from the literature and local context. First, nurse-to-patient ratios in Nigerian hospitals remain high, even in ICUS, making sustained observation and action challenging. Second, the absence of electronic health records or digital alert systems means that early warning scores must be manually calculated, increasing the risk of omission. Third, hierarchical dynamics may suppress the auton omy of nursing staff, delaying or deterring escalation even when clinical deterioration is recognised. Finally, the absence of real-

time audit and feedback systems means that lapses in recognition and response are rarely detected or corrected, allowing suboptimal practices to persist.

These structural and cultural challenges are not insurmountable. International evidence has shown that investment in early recognition systems can yield substantial clinical dividends. A multicenter longitudinal study in the Netherlands demonstrated that hospitals adopting rapid response systems anchored on nurse-led EWS experienced a 30% reduction in cardiac arrests and unplanned ICU admissions[8]. Similarly, in South Africa, structured implementation of EWS coupled with continuous vital sign audits reduced mortality from septic shock by 23%[9]. The key ingredients in these successes were not merely the tools themselves, but the leadership, training, and institutional commitment to their use. Our findings reaffirm that clinical tools such as EWS are only as effective as the systems that support their implementation. It is not enough to train nurses on scoring algorithms; there must be an enabling environment that allows them to escalate care without fear, confusion, or delay. As Vincent et al. (2018) argued, sustainable improvement in patient safety requires more than protocols—it requires culture change, cross-disciplinary collaboration, and a learning health system informed by routine data feedback[10].

RECOMMENDATIONS

First, institutional policies must mandate the consistent use of EWS and define clear escalation pathways. Second, regular training and simulation exercises should be conducted to reinforce protocol adherence and empower nurses to act. Third, consideration should be given to introducing low-cost digital tools for vital sign monitoring and automated scoring, even in resource-limited ICUS. Finally, a culture of accountability must be nurtured—one that values timely escalation as a clinical strength rather than an admission of failure.

CONCLUSION

This study highlights the critical role of nursing staff in the early recognition of clinical deterioration within the ICU and illustrates how the gap between observation and action continues to undermine patient safety. While documentation practices in UPTH's ICU were robust, the inconsistent escalation of care and limited use of early warning systems point to systemic vulnerabilities that require urgent attention. Bridging these gaps through structured protocols, staff empowerment, and institutional commitment can significantly reduce preventable deaths and enhance the quality of critical care in Nigeria and similar settings.

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