



PREDICTIVE ACCURACY OF THE PRISM III SCORE FOR MORTALITY AMONG CRITICALLY ILL CHILDREN ADMITTED TO A TERTIARY CARE PAEDIATRIC INTENSIVE CARE UNIT

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ABSTRACT

Background: Paediatric Intensive Care Units (PICUs) manage critically ill children requiring continuous monitoring and advanced life support. Mortality prediction is essential for guiding treatment decisions, optimizing scarce resources, and improving clinical outcomes. The Paediatric Risk of Mortality III (PRISM III) score is among the most validated severity-of-illness scoring systems worldwide; however, limited data exist on its performance in Indian PICUs.

Aim: To determine the predictive accuracy of PRISM III for mortality among critically ill children admitted to a tertiary care PICU.

Methods: A descriptive observational study was conducted over one year in the PICU of a tertiary care teaching hospital. One hundred critically ill children aged 1 month–14 years were enrolled. PRISM III scoring was performed within 24 hours of admission using clinical and laboratory parameters. Outcomes were recorded as discharge or death. Statistical analysis included chi-square tests, t-tests, Mann–Whitney U tests, ROC curve analysis, and diagnostic accuracy assessment using a confusion matrix.

Results: Of the 100 children studied, 81% survived and 19% died. Most patients were under 5 years (71%), with males constituting 60% of the cohort. Infectious diseases contributed the highest mortality (39.13%), with cerebral malaria (100%), pyogenic meningitis (50%), septic shock (40%), and acute encephalitis (40%) showing the highest fatality. Non-survivors had significantly lower systolic BP (49.42 vs. 75.88 mmHg), higher heart rate (216.84 vs. 174.75 bpm), higher temperature (41.08 vs. 37.92°C), and lower GCS (5.89 vs. 12.65), all $p < 0.001$. Ventilatory support (39%) and inotropic support (34%) were strongly associated with mortality, with all deaths occurring in ventilated patients. ROC analysis demonstrated excellent discrimination, with a PRISM III cutoff of 12 yielding 100% sensitivity, 98.77% specificity, 95% PPV, 100% NPV, and 99% accuracy.

Conclusion: PRISM III is an effective and highly accurate mortality prediction tool in critically ill children in the Indian PICU setting. Early identification of high-risk patients using PRISM III can

guide timely intervention, improve triage, enhance resource allocation, and strengthen pediatric critical care outcomes.

Keywords: PRISM III, Paediatric mortality, PICU, Severity scoring, Critical illness, Predictive accuracy, ROC curve

INTRODUCTION

Paediatric Intensive Care Units (PICUs) represent the frontline of hospital-based care for critically ill children, offering continuous monitoring, advanced life-support, and specialized therapeutic interventions. Despite remarkable advancements in paediatric critical care, PICUs continue to witness substantial morbidity and mortality, especially in resource-limited settings where constraints in staffing, diagnostic support, and infrastructure remain major challenges [1]. The ability to accurately predict mortality in critically ill children is crucial for improving clinical decision-making, optimizing the use of scarce resources, guiding family counselling, and benchmarking the quality of care. Predictive models provide clinicians with objective, quantifiable measures of illness severity, allowing for early identification of high-risk patients and timely interventions [1].

Critical illness in children often presents with rapid physiological deterioration and complex, heterogeneous disease processes. This variability makes outcome prediction particularly difficult in paediatric care compared to adult intensive care. To address this challenge, standardized severity-of-illness scoring systems have become essential tools in PICUs. These systems assess physiological derangements, stratify patients according to risk, and support objective comparison of outcomes across different populations and institutions. Among these, the Paediatric Risk of Mortality (PRISM) score and the Paediatric Index of Mortality (PIM) are the most widely validated. Both have demonstrated strong discriminatory capability with area under the ROC curve values (AUC) exceeding 0.8, indicating good accuracy in predicting mortality among critically ill paediatric patients [2,3].

Adaptation and validation of these scoring models in developing countries have gained momentum in recent years as healthcare systems seek reliable tools to evaluate PICU performance. Studies conducted in Barbados and India have shown that the PIM-2 model performs reasonably well in predicting PICU outcomes, as reflected by standardized mortality ratios close to 1 [1,4]. Furthermore, modern approaches involving artificial intelligence, such as the Super ICU Learner Algorithm (SICULA), have been explored to overcome the limitations of traditional scoring systems and enhance predictive accuracy [5,6]. Nevertheless, traditional and validated tools like PRISM III remain the backbone of mortality prediction in paediatric critical care due to their comprehensiveness, ease of use, and long-standing clinical credibility.

Among paediatric severity scoring systems, the PRISM score, first introduced by Pollack et al. in 1988, is one of the most extensively studied and widely used worldwide. PRISM was designed to objectively evaluate physiological instability by quantifying deviations across multiple parameters in critically ill children. Over time, refinements in the scoring methodology, improvements in data quality, and advanced statistical modelling led to the development of PRISM III—considered the gold standard in mortality prediction for PICUs [7].

PRISM III includes 17 carefully selected physiological and biochemical variables that reflect vital signs, acid–base status, blood gas parameters, metabolic function, renal function, and haematological abnormalities [7,8]. The score is calculated using the most deranged values observed during the first 12 or 24 hours after PICU admission. Reducing the number of variables from 34 in PRISM to 17 in PRISM III improved its practicality while enhancing predictive accuracy. Many studies have demonstrated excellent discriminatory power of PRISM III, with AUC values often exceeding 0.9, underscoring its strength as a mortality predictor [9,10]. Its reliability across diverse healthcare settings, including those with limited resources, makes it an especially valuable tool for PICU evaluation and benchmarking [11].

Predicting mortality in PICU patients is essential for ensuring optimal utilisation of critical care resources, especially in resource-constrained environments. Early identification of high-risk patients enables timely escalation of care, appropriate allocation of monitoring equipment, and better communication with families. In addition, mortality prediction models contribute significantly to quality improvement initiatives by allowing healthcare institutions to compare observed outcomes with expected mortality rates and identify gaps in care delivery [7].

While PRISM III has been validated extensively in high-income countries and is widely used in benchmarking PICU performance [9], its applicability in developing countries remains inadequately explored. Differences in disease prevalence, nutritional status, socioeconomic context, and healthcare infrastructure may influence the predictive accuracy of PRISM III. This highlights the importance of local validation to ensure that the scoring models are reliable and clinically meaningful within regional PICU settings [11].

India faces a unique set of challenges in paediatric critical care, including a high incidence of infectious diseases, malnutrition, congenital anomalies, and delayed referrals. Although significant progress has been made in expanding PICU services, resource limitations persist, especially in public hospitals and rural areas [12]. Many Indian PICUs lack access to continuous invasive monitoring, advanced ventilatory modes, and timely laboratory support—factors that can compromise outcomes. In these settings, severity scoring systems like PRISM III could play a vital role in optimising patient care by assisting clinicians in risk stratification and early identification of children requiring intensive intervention [2]. However, studies assessing the performance of PRISM III in Indian PICUs have been limited, with some reporting reduced predictive accuracy due to factors such as high rates of malnutrition, varied disease epidemiology, and inconsistent availability of diagnostic tests [2,13]. Therefore, it becomes essential to evaluate the diagnostic performance and predictive accuracy of PRISM III specifically within the Indian context.

PRISM III was developed using a large dataset of over 11,000 paediatric admissions across 32 ICUs, ensuring statistical robustness and applicability across diverse patient populations [7]. The parameters included in PRISM III assess vital physiological functions such as cardiovascular stability (systolic blood pressure, heart rate), neurological status (pupillary response, mental state), acid–base balance (pH, PaCO₂, PaO₂), metabolic and renal function (serum glucose, potassium, creatinine, BUN), and haematological parameters including WBC count, platelet count, PT, and PTT [7,14]. Each variable is assigned a score based on its deviation from normal values, and the cumulative score provides an estimate of mortality risk.

International studies consistently support the strong predictive ability of PRISM III. For instance, U.S.-based validation studies have reported AUC values as high as 0.94 for both the 12-hour and 24-hour scoring windows [7]. PRISM III has also been widely used as a quality assessment tool, allowing PICUs to compare observed mortality rates with predicted values to evaluate overall performance [15].

Despite its proven effectiveness, implementing PRISM III in developing countries is challenging. Factors such as limited laboratory support, inadequate staffing, inconsistent availability of arterial blood gas analysis, and infrastructural variability may affect the accuracy of PRISM III in these settings [10]. Furthermore, the higher burden of infectious diseases and malnutrition in developing countries poses additional challenges, raising concerns about whether PRISM III can adequately capture illness severity in such populations [12].

Although PRISM III is considered one of the most reliable tools for mortality prediction in paediatric critical care, evidence regarding its predictive accuracy in the Indian setting remains limited. Many studies validating PRISM III have been conducted in high-income countries, where patient characteristics, disease prevalence, and healthcare infrastructure differ markedly from those in India. Indian PICUs frequently encounter malnutrition, sepsis, delayed presentation, and limited diagnostic resources, yet these factors are not well accounted for in many international validation studies.

Moreover, the heterogeneous nature of Indian PICU populations, combined with variable availability of laboratory investigations, creates uncertainty about the generalizability of PRISM III scores. While

some Indian studies indicate that PRISM III may perform well in predicting mortality, others report inconsistent findings due to contextual factors [13]. This demonstrates a significant gap in the literature, with few comprehensive studies assessing PRISM III's predictive accuracy using modern statistical techniques such as ROC analysis, confusion matrices, or correlation models.

Given these gaps, a focused evaluation of PRISM III in a tertiary care Indian PICU is essential. The present study is therefore undertaken to assess the predictive accuracy of the PRISM III score for mortality among critically ill children admitted to a tertiary care PICU, providing evidence that can guide clinicians, support decision-making, and enhance paediatric critical care outcomes in the Indian context.

MATERIALS AND METHODS

Study Setting: The study was conducted in the Paediatric Intensive Care Unit (PICU), Department of Paediatrics, Post Graduate Institute of Medical Sciences, Rohtak.

Study Design: A descriptive, observational study was carried out.

Study Period: The study was conducted over a period of one year.

Study Population: All critically ill children admitted to the PICU during the study period were considered eligible for inclusion.

Sample Size: A feasibility sample size of 100 patients was enrolled based on PICU admission rates during the study period.

Inclusion Criteria

- Children aged 1 month to 14 years.
- All critically ill patients admitted to the PICU who required intensive monitoring and management.

Exclusion Criteria

- Children with known chronic illnesses, such as congenital heart diseases, chronic kidney disease (CKD), and chronic liver disease.
- Children with Multiple congenital anomalies.

Data Collection Procedure: PRISM III scoring was performed at the time of PICU admission or within the first 24 hours, using a pretested structured proforma.

Clinical Data: Clinical parameters were recorded by a trained paediatric resident and included:

- Systolic blood pressure
- Heart rate
- Temperature
- Pupillary light reaction
- Glasgow Coma Scale (GCS)

Laboratory Data: Laboratory parameters obtained at admission were documented, including:

- Acid–base profile
- Blood gas values
- Relevant biochemical and hematologic indices (as required for PRISM III calculation)

PRISM III Score Calculation

- The most deranged physiological and laboratory values within the first 12–24 hours of admission were used.
- Individual sub-scores were calculated and summed to obtain the total PRISM III score for each patient.

Follow-Up and Outcomes: Each patient was followed throughout the duration of their PICU stay. Length of stay and final outcome (discharged or death) were recorded.

Statistical Analysis: Data were entered in Microsoft Excel and analyzed using SPSS version 25.0. Continuous variables such as age, vital signs, and laboratory parameters were summarized using mean, median, standard deviation, and interquartile ranges, while categorical variables were presented as frequencies and percentages. The chi-square test was used to assess associations between categorical variables and mortality, including the relationship of inotropic and ventilatory support with outcomes. The independent t-test and Mann–Whitney U test were used to compare continuous variables between survivors and non-survivors, depending on data distribution. Levene’s test was applied to assess the equality of variances. The predictive accuracy of the PRISM III score was evaluated using Receiver Operating Characteristic (ROC) curve analysis, and a confusion matrix was constructed to assess sensitivity, specificity, and overall diagnostic performance at the identified cutoff. A correlation matrix and contingency tables were also generated to examine inter-variable relationships. A p-value of <0.05 was considered statistically significant.

Ethical Considerations: Ethical approval for the study was obtained from the Institutional Ethics Committee before data collection began. Written informed consent was taken from parents or guardians of all participating children. Confidentiality of patient information was strictly maintained throughout the study. Participants were assured that refusal to participate would not affect the quality of care provided. Children found to have severe comorbidities during assessment were appropriately referred for further management. No additional financial burden was imposed on the participants, and the right to withdraw from the study at any stage was clearly explained to all parents.

RESULTS

This descriptive study included 100 critically ill children aged 1 month to 14 years admitted to the PICU over one year. PRISM III scoring was performed within 24 hours of admission. The overall mortality rate was 19%, with 81% of patients surviving to discharge. The median age of the cohort was 24 months (IQR: 10–72). Males constituted 60%, and females 40% of the sample. Most children were below 5 years of age. The distribution of age, gender, and system involvement is summarized in Table 1.

Table 1. Baseline Characteristics of the Study Population (n = 100)

Variable	Category	Frequency	Percentage (%)
Age Group	<5 years	71	71.00
	6–10 years	18	18.00
	11–14 years	11	11.00
Gender	Male	60	60.00
	Female	40	40.00
System Involvement	Respiratory	37	37.00
	Infectious	23	23.00
	Neurological	20	20.00
	Other	12	12.00
	Hepatic	8	8.00

Younger children (<5 years) had better survival (84.51%) compared to older groups. Disease-wise, the highest mortality occurred in Cerebral Malaria (100%), Pyogenic Meningitis (50%), Septic Shock (40%), and Acute Encephalitis (40%). Severe infections carried the highest mortality (Table 2).

Table 2. Age Group–Wise and Diagnosis–Wise Outcomes

Category		Total	Discharged (%)	Deaths (%)
Age group	Age <5 years	71	60 (84.51%)	11 (15.49%)
	Age 6–10 years	18	13 (72.22%)	5 (27.78%)
	Age 11–14 years	11	8 (72.73%)	3 (27.27%)
Diagnosis	Septic Shock (n=10)	10	6 (60%)	4 (40.00%)
	Acute Encephalitis (n=5)	5	3 (60%)	2 (40.00%)
	Pyogenic Meningitis (n=4)	4	2 (50%)	2 (50.00%)
	Cerebral Malaria (n=1)	1	0 (0%)	1 (100%)

Respiratory illnesses had the highest survival (89.19%). Infectious conditions contributed the most deaths (39.13%). Survivors had significantly better physiological values. Deaths were associated with:

- Lower SBP (49.42 vs. 75.88 mmHg)
- Higher HR (216.84 vs. 174.75 bpm)
- Higher temperature (41.08 vs. 37.92°C)
- Lower GCS (5.89 vs. 12.65)

All parameters differed significantly between survivors and non-survivors, indicating their value as mortality predictors (Table 3).

Table 3. Vital Signs Comparison Between Outcome Groups

Variable	Discharged (Mean ± SD)	Deaths (Mean ± SD)	p-value
Systolic BP (mmHg)	75.88 ± 7.87	49.42 ± 3.64	<0.001
Heart Rate (bpm)	174.75 ± 18.94	216.84 ± 10.30	<0.001
Temperature (°C)	37.92 ± 0.85	41.08 ± 0.49	<0.001
GCS	12.65 ± 1.29	5.89 ± 0.81	<0.001
pH	7.40 ± 0.03	7.02 ± 0.08	<0.001
PaO ₂ (mmHg)	61.83 ± 4.39	39.21 ± 2.84	<0.001

Both inotropic and ventilatory support were strongly linked to mortality. All deaths occurred in patients who required ventilation, demonstrating strong association with disease severity (Table 4).

Table 4: Interventions vs. Outcomes

Variable	No Support n (%)	Support n (%)	Mortality (%)	p-value
Inotropic Support (n=34)	66 (No)	34 (Yes)	34/100 → 34.00%	<0.001
Deaths	0	19	19/34 → 55.88%	
Ventilatory Support (n=39)	61 (No)	39 (Yes)	39/100 → 39.00%	<0.001
Deaths	0	19	19/39 → 48.72%	

Predictive Accuracy of PRISM III Score

ROC analysis revealed outstanding discrimination.

- Cutoff: 12

- Sensitivity: 100%
- Specificity: 98.77%
- PPV: 95%
- NPV: 100%
- Accuracy: 99%

The confusion matrix showed:

- True Positives – 19
- True Negatives – 80
- False Positives – 1
- False Negatives – 0

PRISM III score ≥ 12 correctly identified all mortality cases.(Figure 1)

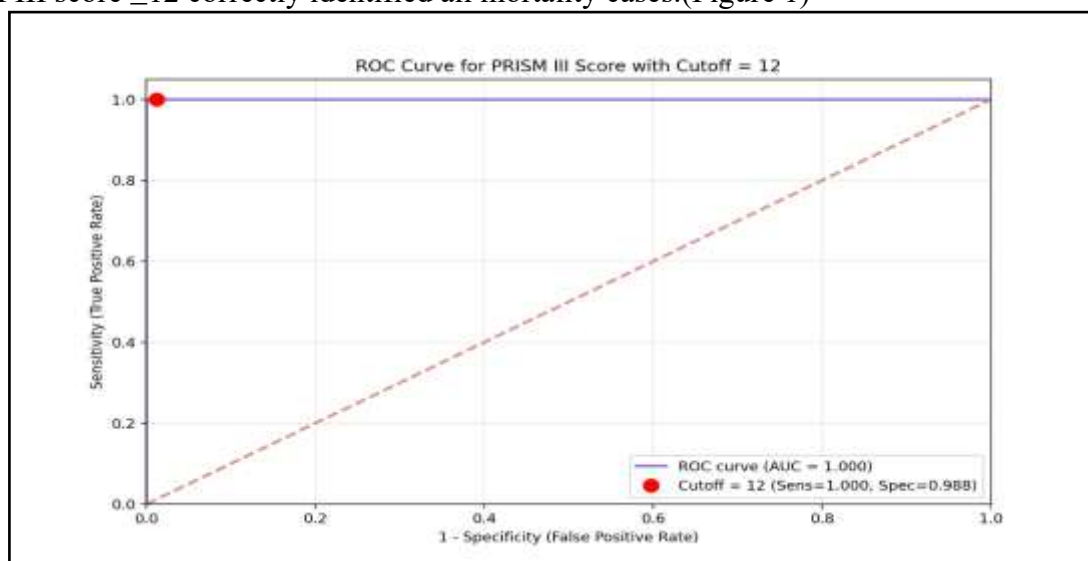


Figure 1: ROC Curve with Cutoff Point

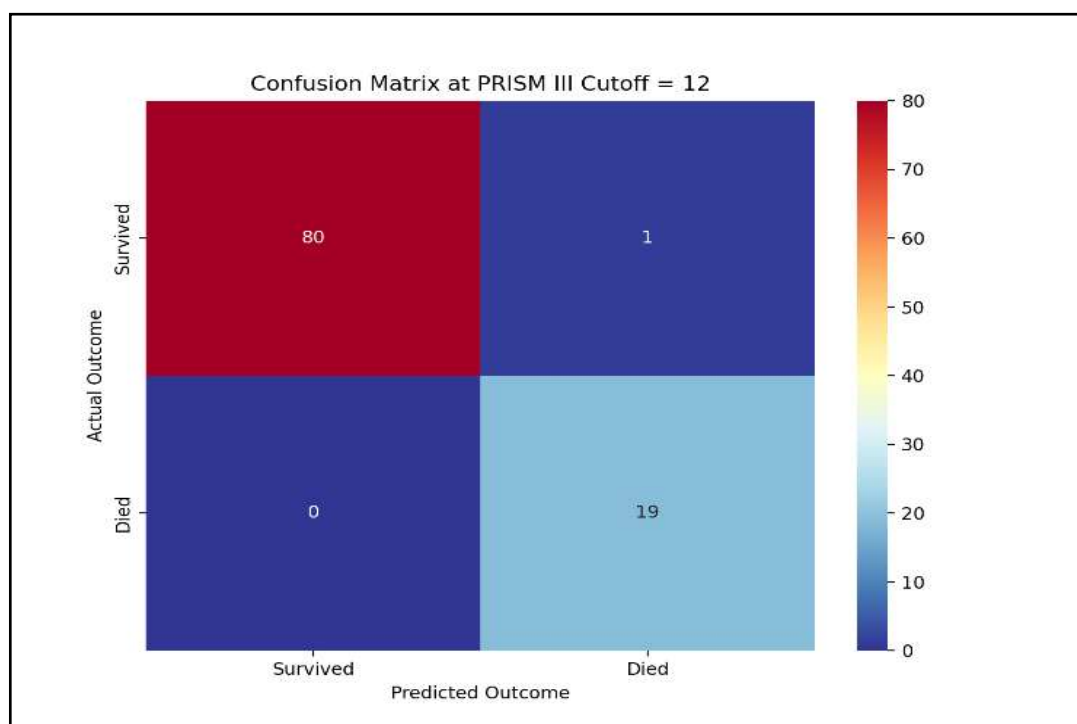


Figure 2: Confusion matrix at PRISM III Cutoff = 12

The study revealed that mortality was highest in infectious and neurological conditions. Younger age, hypotension, hyperthermia, tachycardia, low GCS, metabolic acidosis, and hypoxemia were strongly associated with deaths. Interventions such as inotropic and ventilatory support were markers of severe illness and high mortality. The PRISM III score demonstrated excellent predictive accuracy, with perfect sensitivity and near-perfect specificity.

DISCUSSION

This study evaluated 100 critically ill children admitted to the PICU of Pt. B.D. Sharma PGIMS, Rohtak, and provides important insights into paediatric disease burden, mortality predictors, and the performance of the PRISM III score as a mortality prediction tool. The findings reinforce existing evidence on paediatric critical illness patterns while adding locally relevant data on predictors of mortality in a North Indian tertiary care setting.

The median age of the cohort was 24 months (IQR 10–72 months), indicating that most admissions were infants and young children. This aligns with global data showing that younger children are more susceptible to critical illness due to their immature immune system and limited physiological reserves, predisposing them to rapid deterioration in conditions such as sepsis and shock. Sepsis is already known to be associated with high PICU mortality worldwide [16]. The predominance of toddlers and preschool-aged children in this cohort reflects similar patterns reported in studies using PRISM and PIM scoring systems, where children under two years show higher illness severity and greater risk of MODS [17].

Although younger children (<5 years) had a higher discharge rate (84.51%), they represented 71% of total admissions, meaning that the absolute number of deaths remained noteworthy in this group. This emphasizes the need for heightened vigilance and early management in infants and toddlers, who deteriorate quickly once critically ill.

Gender distribution showed a male predominance (60%), consistent with previous PICU studies globally and in India [18]. Biological susceptibility to infections or gender-related differences in healthcare-seeking behavior may explain this trend. Male mortality was highest in infectious diseases (35.7%), whereas female mortality was comparatively higher in hepatic and miscellaneous conditions. Studies suggest gender-based differences in immune response and healthcare access, though existing literature shows no consistently proven mortality advantage for either gender when evaluated using PRISM III and PIM-2 [19].

Respiratory illnesses were the most common cause of PICU admission (37%), which mirrors global data indicating respiratory distress, pneumonia, and bronchiolitis as leading contributors to paediatric critical illness [20]. The high survival rates for respiratory diseases (89.19%) reflect advances in mechanical ventilation, non-invasive strategies, and early oxygen therapy.

Infectious diseases accounted for 23% of admissions but contributed disproportionately to mortality (39.13%). Sepsis, severe dengue, and cerebral malaria were major contributors. Sepsis remains a leading cause of PICU mortality worldwide, with mortality rates ranging from 39%–52% [18]. The high mortality seen in septic shock (40%) and dengue hemorrhagic fever (33.33%) in this study is consistent with the well-established risk of rapid progression to MODS in untreated or late-presenting infections [16].

Neurological conditions exhibited mixed outcomes. Acute encephalitis carried a high mortality of 40%, reflecting the devastating impact of intracranial hypertension and inflammatory brain injury. In contrast, Guillain–Barré syndrome demonstrated a 100% survival rate, consistent with literature showing excellent outcomes with timely IVIG therapy and ventilatory support when required [21]. This highlights the heterogeneity of neurological presentations and the importance of early diagnosis.

The overall mortality rate in this study was 19%. Mortality was highest among children aged 6–14 years (27–28%), contrary to the common perception that younger children always fare worse. Possible explanations include delayed presentation in older children, more severe disease at admission, and higher incidence of conditions such as cerebral malaria and septic shock in this age group. Studies have noted that age alone is not always a mortality determinant; disease severity at presentation plays a more decisive role [19].

Certain diagnoses showed alarming mortality:

- Cerebral malaria – 100%
- Pyogenic meningitis – 50%
- Septic shock – 40%
- Acute encephalitis – 40%
- Dengue hemorrhagic fever – 33.3%

The high mortality in these conditions reflects their aggressive disease course and the need for early recognition and rapid initiation of therapy. Similar findings have been reported in regions where infectious diseases form a major portion of PICU admissions [22].

Inotropic support was administered to 34% of children, and mortality in this group was significantly higher. Children requiring inotropes also had lower systolic BP and higher heart rates, indicating advanced shock. Numerous studies have confirmed that inotropic support correlates strongly with mortality, especially in multi-organ dysfunction [23]. Comparable studies in Karachi report a mortality rate as high as 49.4% among inotrope-dependent children [17].

Ventilatory support was required in 39% of patients, and importantly, all 19 deaths occurred in ventilated patients. This association suggests that mechanical ventilation served as a surrogate marker of severe respiratory or neurological compromise. Multiple studies have similarly shown mechanical ventilation to be an independent predictor of mortality [24], with Sri Lankan data showing an 81.8% mortality rate in ventilated children [25].

Vital signs showed significant differences between survivors and non-survivors. Hypotension, tachycardia, hyperthermia, and low GCS were strongly associated with mortality. Systolic BP was particularly important; non-survivors had a mean SBP of only 49.42 mmHg, indicating terminal circulatory collapse. Persistent hypotension is a known hallmark of septic shock and is strongly correlated with mortality [26].

Tachycardia and hyperthermia often reflect systemic inflammation and sepsis. Low GCS correlated strongly with mortality, reinforcing neurological impairment as a major prognostic factor, consistent with findings from Pakistani studies reporting low GCS as a key mortality determinant [27].

Blood gas abnormalities—including severe acidosis (mean pH 7.02), hypercapnia ($p\text{CO}_2$ 84.74 mmHg), and hypoxemia (PaO_2 39.21 mmHg)—were consistently worse in the death group. These parameters are recognized markers of impending deterioration and poor prognosis.

The PRISM III score performed exceptionally well in predicting mortality in this cohort. A cutoff score of 12 provided:

- Sensitivity: 100%
- Specificity: 98.77%
- PPV: 95%
- NPV: 100%
- Overall accuracy: 99%

These findings confirm the robustness of PRISM III as a screening and risk-stratification tool. Similar findings were observed in West Bengal, where mortality increased stepwise with PRISM III categories [26], and Karachi where AUC was 0.903 [27]. Thus, PRISM III remains a highly valid instrument across diverse healthcare settings.

When compared with studies from Kerala, Karachi, Faridkot, Ahmedabad, and Jodhpur, the mortality rate in this study (19%) was similar to Ahmedabad (19.2%) but lower than Karachi (37.3%) and Jodhpur (33.8%). PRISM III sensitivity (100%) was comparable to the Kerala study (100%) but higher than Karachi (73.7%). The pattern of risk factors—hypotension, low GCS, abnormal blood gases—matched findings from multiple centers.[24-28]

The findings of this study reinforce the clinical utility of PRISM III in identifying high-risk children early in the course of illness. Children with PRISM >12, hypotension, severe acidosis, and requiring inotropic or ventilatory support should be considered extremely high risk. Early aggressive management, timely referral to higher centers, and prioritization for ICU beds and resources may significantly improve outcomes.

CONCLUSION

This study demonstrates that the PRISM III score is a highly accurate and reliable predictor of mortality among critically ill children admitted to a tertiary care PICU. With a mortality rate of 19%, the study identified significant physiological and biochemical differences between survivors and non-survivors, including hypotension, tachycardia, hyperthermia, low GCS, severe acidosis, hypercapnia, and hypoxemia. The need for inotropic and ventilatory support emerged as strong markers of severe illness and poor outcomes. PRISM III showed excellent predictive capacity, with 100% sensitivity, 98.77% specificity, and 99% overall accuracy at a cutoff score of 12. These findings highlight the utility of PRISM III as a vital tool for early risk stratification, timely escalation of care, and efficient resource allocation in PICUs. The study underscores the importance of incorporating standardized scoring systems into routine clinical practice, particularly in resource-limited settings, to improve survival outcomes and guide high-quality paediatric critical care.

REFERENCES

1. Hariharan S, Krishnamurthy K, Grannum D. Validation of Pediatric Index of Mortality-2 Scoring System in a Pediatric Intensive Care Unit, Barbados. *Journal of Tropical Pediatrics* 2011;57:9–13.
2. Thukral A, Lodha R, Irshad M, Arora NK. Performance of Pediatric Risk of Mortality (PRISM), Pediatric Index of Mortality (PIM), and PIM2 in a pediatric intensive care unit in a developing country. *Pediatric Critical Care Medicine* 2006;7:356–61.
3. Gemke RJ, van Vught JA. Scoring systems in pediatric intensive care: PRISM III versus PIM. *Intensive Care Med* 2002;28:204–7.
4. Suresh S, Varadarajan P, Sangareddi S, Gandhi J. Pediatric index of mortality 2 score as an outcome predictor in pediatric Intensive Care Unit in India. *Indian Journal of Critical Care Medicine* 2013;17:288–91.
5. Pirracchio R, Petersen ML, Carone M, Rigon MR, Chevret S, van der Laan MJ. Mortality prediction in intensive care units with the Super ICU Learner Algorithm (SICULA): a population-based study. *Lancet Respir Med* 2015;3:42–52.
6. Jalali A, Bender D, Rehman M, Nadkanri V, Nataraj C. Advanced analytics for outcome prediction in intensive care units. *2016 38th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)* 2016, p. 2520–4.
7. Pollack MM, Patel KM, Ruttimann UE. PRISM III: an updated Pediatric Risk of Mortality score. *Crit Care Med* 1996;24:743–52.
8. Kaur A, Kaur G, Dhir SK, Rai S, Sethi A, Brar A, et al. Pediatric Risk of Mortality III Score - Predictor of Mortality and Hospital Stay in Pediatric Intensive Care Unit. *J Emerg Trauma Shock* 2020;13:146–50.

9. Varma A, Damke S, Meshram R, Vagha J, Kher A, Vagha K. Prediction of mortality by pediatric risk of mortality (PRISM III) score in tertiary care rural hospital in India. *International Journal of Contemporary Pediatrics* 2017;4:322–7.
10. Paul S, Barik KL, Ghosh N, Laha S, Bera S, Nath S. An observational study to evaluate the outcome of patients admitted in pediatric intensive care unit (PICU) using pediatric risk of mortality (PRISM-III) score in a tertiary care hospital of West Bengal. *Asian Journal of Medical Sciences* 2023;14:171–7.
11. Hassan ZE, Quyyoom I, Mushtaq I. Validity of PRISM Score in Predicting Mortality in a Tertiary Care Hospital in North India. *IJCMR* 2018;5.
12. Thiyaagu G. Pediatric risk of Mortality III (PRISMIII) score as a predictor of mortality in PICU, Institute of Child Health and Hospital for Children, Egmore, 2006.
13. Madaan G, Bhardwaj AK, Sharma PD, Dhanjal GS. Validity of pediatric risk of mortality score in prediction of mortality in North Indian pediatric intensive care unit. *Indian Journal of Child Health* 2014;1:105–8.
14. Srinivas N, Venugopal K, Venkatesha GA, Chidanand N. Comparison of Pediatric Risk of Mortality (PRISM III) score with Pediatric Index of Mortality (PIM III) score in Pediatric Intensive Care Unit: A Single center, prospective observational study from South India. *Journal of Pediatric Critical Care* 2024;11:208–12.
15. Marcin JP, Pollack MM, Patel KM, Ruttimann UE. Decision support issues using a physiology based score. *Intensive Care Med* 1998;24:1299–304.
16. Bacha AJ, Gadisa D, Gudeta MD, Beressa TB, Negera GZ. Survival Status and Predictors of Mortality Among Patients Admitted to Pediatric Intensive Care Unit at Selected Tertiary Care Hospitals in Ethiopia: A Prospective Observational Study. *Clinical Medicine Insights Pediatrics* 2023;17.
17. Joshi P, Agrawal S, Ghimire J, Shrestha PN, Khatun N, Banjara M. Application of Pediatric Risk of Mortality (PRISM) III Score in Predicting Mortality Outcomes. *Journal of Nepal Health Research Council* 2024;21(3):450–7.
18. Mazhar MB, Hamid M. Validity of Pediatric Index of Mortality 2 score as an Outcome Predictor in Pediatric ICU of a Public Sector Tertiary Care Hospital in Pakistan. *Journal of Pediatric Intensive Care* 2021.
19. Gandhi J, Sangareddi S, Varadarajan P, Suresh S. Pediatric index of mortality 2 score as an outcome predictor in pediatric Intensive Care Unit in India. *Indian Journal of Critical Care Medicine: Peer-Reviewed, Official Publication of Indian Society of Critical Care Medicine* 2013;17:288–91.
20. Hariharan S, Krishnamurthy K, Grannum D. Validation of Pediatric Index of Mortality-2 scoring system in a pediatric intensive care unit, Barbados. *Journal of Tropical Pediatrics* 2011;57(1):9–13.
21. Barua SK, Deb KP, Dutta A, Mahmud N, Chowdhury P, Barua S. Disease Profile and Outcome of Patients Admitted to A Pediatric Intensive Care Unit. *Journal of Chittagong Medical College Teachers' Association* 2018.
22. El-Nawawy A. Evaluation of the outcome of patients admitted to the pediatric intensive care unit in Alexandria using the pediatric risk of mortality (PRISM) score. *Journal of Tropical Pediatrics* 2003;49(2):109–14.
23. Dursun O, Hazar V, Karasu G, Uygun V, Tosun O, Yeşilipek A. Prognostic Factors in Pediatric Cancer Patients Admitted to the Pediatric Intensive Care Unit. *Journal of Pediatric Hematology/Oncology* 2009;31:481–4.
24. Chauhan DS, Kumar DA, Jaiswal DR. Use of PRISM III scoring for mortality prediction in a tertiary care centre of Rohilkhand region. *International Journal of Paediatrics and Geriatrics* 2022.
25. Mukthar F, Faizal MA M, Herath HM, Bamunuarachchi C, Samarasinghe PTV. A study on the prediction of illness related mortality of critically ill children by applying paediatric risk mortality

- III score in paediatric medical intensive care unit patients. *Sri Lanka Journal of Child Health* 2018.
26. Mirza S, Malik L, Ahmed J, Malik F, Sadiq H, Ali S, et al. Accuracy of Pediatric Risk of Mortality (PRISM) III Score in Predicting Mortality Outcomes in a Pediatric Intensive Care Unit in Karachi. *Cureus* 2020;12.
27. Anjali MM, Unnikrishnan DT. Effectiveness of PRISM III score in predicting the severity of illness and mortality of children admitted to pediatric intensive care unit: a cross-sectional study. *Egypt Pediatr Assoc Gaz* 2023;71:25. <https://doi.org/10.1186/s43054-023-00171-0>.
28. Popli V, Kumar A. Validation of PRISM III (Pediatric Risk of Mortality) scoring system in predicting risk of mortality in a pediatric intensive care unit. *IOSR J Dent Med Sci* 2018;17(3):81-7. <https://doi.org/10.9790/0853-1703198187>.