EVALUATION OF NEUROLOGICAL OUTCOMES USING PAEDIATRIC CEREBRAL PERFORMANCE CATEGORY (PCPC) SCORE IN PICU AT KLES DR. PRABHAKAR KORE HOSPITAL AND M.R.C, BELAGAVI- A 1-YEAR CROSS SECTIONAL STUDY.

By

REG NO: BM0120013

Dissertation

Submitted to
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IN

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BELAGAVI- 590010. KARNATAKA.

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KLE ACADEMY OF HIGHER EDUCATION AND RESEARCH, BELAGAVI, KARNATAKA

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ACCEPTANCE LETTER

The softcopy of thesis entitled: **"EVALUATION OF NEUROLOGICAL OUTCOMES USING PAEDIATRIC CEREBRAL PERFORMANCE CATEGORY (PCPC) SCORE IN PICU AT KLES DR. PRABHAKAR KORE HOSPITAL AND M.R.C, BELAGAVI- A 1 YEAR CROSS SECTIONAL STUDY"** has been submitted for Anti-Plagiarism check through Turnitin software. The scan has been carried out and the scanned output reveals a match percentage of **10%** which is within the acceptable limits of **10%** as per the guidelines given by UGC.

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INSTITUTIONAL ETHICAL CLEARANCE

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To,

PG student in Paediatrics,
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Sub: Institutional Ethical Clearance for the study.

With reference to the above, we wish to inform you that your proposed research project titled **"EVALUATION OF PAEDIATRIC CEREBRAL PERFORMANCE CATEGORY (PCPC) SCORE USED TO ASSESS NEUROLOGICAL OUTCOMES AFTER CARE IN PICU AT KLES DR. PRABHKAR KORE HOSPITAL AND M.R.C, BELAGAVI – A 1 YEAR CROSS SECTIONAL STUDY"**, is ethical and justifiable. The proposed research project has been cleared by the JNMC Institutional Ethics Committee on Human Subjects Research.

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ABSTRACT

Background: With evolution in care in PICU, the outcomes have improved from mortality to morbidity to morbidity with favourable outcomes. Neurological outcomes tend to affect growth and development of children. Paediatric Cerebral Performance Score (PCPC) is identified as an assessment tool for evaluation of Neurological Outcomes after care in PICU.

Objectives: The present study was planned to evaluate Neurological Outcomes using PCPC score after PICU care.

Study Design: A one-year observational study conducted in PICU of Tertiary Care Hospital in North Karnataka.

Study Participants: Out of 638 admissions, 142 children eligible for the study admitted to PICU with an acute illness were assessed at discharge and on a follow up after 3 months using the PCPC score.

Results: Male preponderance was noted among the study participants with male to female ratio of 1.17:1. The mean age of study participants was 5.41years. Majority of the study participants had Infectious cause (25.0%), 24.32% had Respiratory system, 20.95% had Central Nervous system. The mean PCPC score at discharge and at 3 months follow up was statistically significant. Mean dPCPC score was 1.13± 0.31 and was statistically significant (p= 0.01878). Children admitted with high Mortality risk, longer ICU stay, prolonged ventilation had higher PCPC scores at discharge than follow up. Majority showed improvement at 3 month follow up. PCPC score has high specificity (98.57%) and accuracy (97.18%) to evaluate Neurological dysfunction.

Conclusion: PCPC score is a specific and accurate score to evaluate Neurological dysfunction after PICU care.

Keywords: Neurological Outcomes, PCPC score, PICU

LIST OF ABBREVIATIONS USED

AGE	-	Acute Gastroenteritis
ADEM	-	Acute Demyelinating Encephalomyelitis
AGN	-	Acute Glomerulonephritis
AIHA	-	Autoimmune Hemolytic Anemia
AMA	-	Against Medical Advice
AUC	-	Area Under Curve
BOOP	-	Bronchiolitis Obliterans Organizing Pneumonia
CHD	-	Congenital Heart Disease
CCF	-	Congestive Heart Failure
CVS	-	Cardiovascular System
COVID	-	Corona Virus Disease
CNS	-	Central Nervous System
dPCPC score	-	delta Paediatric Cerebral Performance Category score
DKA	-	Diabetic Ketoacidosis
DORV	-	Double Outlet Right Ventricle
DCM	-	Dilated Cardiomyopathy
DM	-	Diabetes Mellitus
FSS	-	Functional Status scales
GBS	-	Guillian Barre Syndrome

GCS	-	Glassgow Coma Scale
HRQoL	-	Health related Quality of life
LRTI	-	Lower Respiratory Tract Infection
MISC	-	Multisystem Inflammatory Syndrome in Children
OHCA	-	Out of Hospital Cardiac arrest
PICU	-	Paediatric Intensive Care Unit
PRISM III score	-	Paediatric Risk of Mortality III score
PRISM IV score	-	Paediatric Risk of Mortality IV score
PCPC score	-	Paediatric Cerebral Performance Category score
POPC	-	Paediatric Overall Performance Category Score
PPV	-	Positive Predictive Value
ROC	-	Receptor Operative Curve
RS	-	Respiratory System
RTA	-	Road Traffic Accident
TBI	-	Traumatic Brain Injury
URTI	-	Upper Respiratory Tract Infection
WALRI	-	Wheeze Associated Lower Respiratory Tract Infection

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INTRODUCTION

Critical illness and admission in Paediatric Intensive Care unit has crucially affected the children as well as the parents. Admission in the Paediatric Intensive Care Unit for an acute illness has shown to have effects on the physical, mental and cognitive growth of the children, affecting their quality of life[1] . The newer modalities and protocol-based management of critical illness has improved the care of patients in PICU thereby, significantly decreasing the mortality rates in Paediatric Intensive Care Units and improving the survival. [3]

The survival outcomes in children admitted in PICU and with diagnoses including severe infections, cardiac failure, respiratory failure and oncological disorders have shown an improving trend. [1] The increased survival of PICU patients has translated to outcomes with increased morbidity among survivors. The different outcomes are cardio-respiratory, cognitive, voice changes, physical scars. Out of all the outcomes amongst the patients admitted in PICU, Neurological outcomes tend to affect the child more severely.[1]

The Paediatric Research Care Community recently has shifted the focus of care from survival to survival with favourable Neurological Outcomes because the neurodevelopmental outcomes following PICU admission have multi-pronged effects on the cognitive and mental development.

Paediatric functional outcome assessment can evaluate the changes in growth and development and are subjective. [7] Several functional assessment scales have been developed to maximise objectivity. Pollack et al., developed Functional status scale (FSS) which allows more defined and accurate assessment of all types of patients,

providing more objective results. The Paediatric Overall Performance Category (POPC) and Paediatric Cerebral Performance Category (PCPC) scales are functional status scales based on observer impressions. Both the scales are validated and have shown the sensitivity of >84.9% and specificity of 81.7%.

Paediatric Cerebral Performance Category Score (PCPC) has been beneficial in assessing the neurological outcomes in terms of intellectual and cognitive ability after care in PICU. The PCPC score ranges from 1–6. PCPC is assessed at baseline and on subsequent follow up. The Delta PCPC (dPCPC) is the difference between the PCPC score at discharge and follow up, which is categorised according to decline. Children with Group 2 (2-5 category decline) had moderate to severe neurocognitive dysfunction and are subjected to follow up with Paediatric Neurologist.

Currently there is limited data in this domain in the Indian setting, hence, we conducted this study with the objective of evaluating Neurological Outcomes using Paediatric Cerebral Performance Category (PCPC) score after care in Intensive Care Unit a tertiary care hospital in North Karnataka.

OBJECTIVES

Primary Objective:

To evaluate the neurological outcomes using Paediatric Cerebral Performance Category Score after care in PICU of Paediatrics Department, teaching hospital attached to KAHER's Jawaharlal Nehru Medical College, Belagavi.

Secondary Objective:

To assess the quality of PICU care in terms of outcomes after discharge, based on following factors:

i. Length of stay
ii. Length of ventilation
iii. Reasons for admission
iv. Diagnosis at discharge
v. Treatment given

REVIEW OF LITERATURE

Following the rapid advances in Intensive care infrastructure and management over the past years, along with the spiralling cost of medical care, outcome analysis including morbidity risk prediction has become a challenge for the modern-day Paediatric Intensivists.[1]

The assessment of the outcomes of patients after care in PICU has changed over the last years. The improved infrastructure and use of mechanical and artificial organ support systems have resulted in improved survival rates in most Paediatric intensive care units (PICUs), hence the survival after admission to ICU is no longer the only outcome of interest. [2] Thus, increasingly functional outcome and quality of life are crucial. The physical and cognitive capacity of a child to perform tasks and have a good functional outcome is defined differently from the health-related quality of life (HRQoL), which evaluates the individual's emotional health and well- being and other functional capacity indicators. [2]

When it is determined to analyse the outcome after ICU for its patients, it is necessary to decide about the factors of outcome i.e survival, functional or quality of life. It is very important to have clarity about the aim when performing outcome studies. Parents need to be clearly communicated with the information, either general or specific, which will be used in the study.

The use of this data for outcome prediction about an individual patient to be acquired should be specific and accurate information, confidential and is relevant to that patient and his/her diagnosis. If the information is to be utilised to decide about treatment and outcome or to suggest change in infrastructure, then accurate

demographic data and treatment should be procured. Outcome assessment will be beneficial to the parents, intensive care staff, and health administrators.

Need for the development of scoring system

During the early 90s, the focus has shifted from the more traditional quality of care and mortality risk prediction, to morbidity with favourable and unfavourable outcomes correlating with quality of care, treatment protocols and morbidity prediction. Efforts to recognise and subsequently improve such factors would lead to an improvement of care. Scarce resources can also be channelled into areas where the greatest number of benefits could be seen.[3]

The outcome of any individual child is dependent on many several factors, including demographic profile along with diagnosis, known illness, severity of illness, infrastructure of ICU and other factors such as treatments protocols, Intensive care practices and overall infrastructure. These factors are likely to change over time; hence, outcome of single unit can improve drastically.

It is extremely necessary to assess the child being discharged from PICU after the acute illness as the stay in PICU and management can affect the child's development. A growing child has a dynamic graph of development and any trough in it can be attributed to the acute illness needing PICU admission. Over the years, the scoring in PICU has evolved from outcome after admission to outcome after discharge as the care has improved with defined protocols and advancement in technology.

Mortality assessment scores

PRISM III score was introduced in year 1996. PRISM III was the improvised and refined version of the original PRISM. Reassessment of physiologic variables and their ranges, age-specific adjustment for selected variables, and additional risk factors resulted in a mortality risk model with better accuracy. PRISM IV, an updated and refined version of PRISM III was introduced in 2015.

The PRISM III Score is calculated out of 52, with a single set of 17 Physiological variables with age specific ranges for each variable with 24 hours of admission. Higher the PRISM III score at admission, higher is the risk of mortality. The PRISM IV score with discrete neurological and non-neurological outcomes was calculated within 4-6 hours after admission. The score is calculated out of 25, with Neurological and Non-Neurological variable Scores derived in PRISM III.

Morbidity assessment scores

Multiple age-specific parameters are applied to evaluate outcome of paediatric patients receiving intensive care, including health-related quality of life and functional health. These parameters should be evaluated at discharge and follow up. (7)Therefore, the concept of ‘‘functional status’’ is quite useful for assessing outcomes in children receiving intensive care. Paediatric functional status assessment highlights the changes contributing to growth and development, and are not objective. Different paediatric functional assessment scales have been developed in order to maintain objectivity. The Paediatric Overall Performance Category (POPC) and Paediatric Cerebral Performance Category (PCPC) scales are global scales based on observer impressions.[7]

Paediatric Cerebral Performance Category Score (PCPC) has been beneficial in assessing the neurological outcomes in terms of cognitive function after care in PICU. The PCPC score ranges from 1–6 with 1 being normal and 6 brain death. PCPC is assessed at hospital discharge and on subsequent follow up. The Delta PCPC (dPCPC) is the difference between the PCPC score at discharge and follow up, which is categorised as according to decline. (Annexure II)

Worsening in the neurofunctional status in children admitted to PICU care was observed and varied with clinical presentation and severe illness, cause of admission being primary neurological diagnosis, cardio-respiratory failure required major interventions during the PICU admission, having worse outcomes.[1]

Paediatric Cerebral Performance Category scale was the commonly used tool to evaluate the neuro-cognitive dysfunction assessed at baseline and at hospital discharge. An observational study of 91 children who requiring PICU admission and were followed up after discharge and during 1 month follow up, 22% of patients had poor score.

Studies showed the limitations of sample size, different primary diagnoses, cost, and non-compliant follow-up. European studies reported the outcomes of the survivors in critical care in terms of cognition, adaptive behaviour, and verbal and visual memory in children, but tend to be significantly lower compared to healthy controls. In children admitted to the PICU greater than six days, prevalence of neurocognitive dysfunction increased to 38%.

PICS is defined as "new or worsening impairments in physical, cognitive, or mental health status arising after critical illness and persisting beyond hospitalisation." Anxiety and depression, culminating in post-traumatic stress disorder, has been well documented in adult survivors of critical illness. Children presenting with neurocritical illness, outcomes tend to worsen in children with cardio-respiratory failure and neurocritical illness, compared to TBI. Patients who had higher PCPC at discharge compared to baseline were more likely to have a neurological involvement like history of epilepsy, seizure on presentation, increased seizure burden during the ICU stay and a discharge diagnosis of acute brain injury. Multiple predictors of unfavourable neurologic outcome following paediatric TBI have been described, including increased ICT and decreased cerebral perfusion, low Glasgow Coma Scale (GCS) on admission subarachnoid haemorrhage and cerebral oedema on neuroimaging. Recent research focuses on early identification and treatment of modifiable risk factors for unfavourable outcomes, and on long-term follow-up that goes beyond global cognition ability and is increasingly relying on tests designed to assess multidimensional aspects of neurodevelopment.

In a 2 year follow up study, neurofunctional status declined in children requiring PICU care. This proportion varied based on primary diagnosis and system involvement, with children admitted for primary neurological diagnoses, children who suffered cardiac arrest or who required invasive interventions during the PICU admission, having worse outcomes. PCPC score was used to assess the Neurological deterioration at baseline and follow up at 3 months, 6 months, 1 year and 2 years. [1]

A 3 month follow up study investigated the patients for physical and neurocognitive changes in Paediatric intensive care unit (PICU) survivors.

Neurological and neurocognitive sequelae, consisting of delayed psychomotor development, epilepsy, motor deficits, and concentration and behavioral disturbances, were recognized by use of PCPC score at discharge and 3 month follow up. [2]

A 5-month retrospective study, follow up evaluation comprised of a formal neurological examination and a non-standardised assessment of their development or cognitive function. Neurological and neurocognitive sequelae, consisting of delayed psychomotor development, epilepsy, paresis, and concentration and behavioural disturbances, were found in evaluated children.[3] Functional Status Scale values were determined at PICU discharge.

Authors recommended that, further study and validation across many centres, it may be likely that PCPC score could function as an objective, uniform and unbiased assessment tool for assessing neurological outcomes after care in PICU during the follow up.

MATERIALS AND METHODS

Study Design: Cross sectional study

Study Duration: January 2021- December 2021

Study Population: Patients admitted PICU of Paediatrics Department, teaching hospital attached to KAHER's Jawaharlal Nehru Medical College, Belagavi

Study setting: PICU of Paediatrics Department, teaching hospital attached to KAHER's Jawaharlal Nehru Medical College, Belagavi.

Sample size:

The sample size for this study is calculated using this formula-

$n= (z/d)^2 pq$

n= number of sample estimated

z= Standard normal variate value

p= Prevalance of Neurological Outcomes in PICU patients

q= (100-p)

d= precision of the estimate (typically 5% at 95% confidence intervals)

Prevalence = 10%

$n= (1.96/5)^2$ 10x 90

Where, z=1.96; p=10%; q= (100-10=90); d=5

n= (3.84/25) x 900

n=138

Estimated sample size= 138

Actual Sample Size=150

SAMPLE SELECTION:

Inclusion Criteria:

1. Patients admitted to PICU more than 6 hours
2. Previously normal children
3. No chronic illness

Exclusion Criteria:

1. Known chronic illness
2. Patients admitted to NICU
3. Death at discharge.
4. Discharge against Medical Advice
5. Score 6 at Discharge (Brain death/Death)

Institutional ethical Clearance: The ethical clearance was obtained prior to the conduct of the study, from Institutional Ethics and Research Committee, KAHER's Jawaharlal Nehru Medical College, Belagavi.

Informed consent: A written informed consent was obtained from the parents of the children who fulfilled the selection criteria after explaining the nature of the study. (Annexure I).

Method of collection of data: At admission, the sociodemographic data, Chief complaints and history of presenting illness was obtained from the parents was recorded. a detailed general and systemic examination was performed to assess the vital parameters by the paediatrician and the findings were recorded on a predesigned and pretested proforma (Annexure II). Within 4-6 hours of admission, PRISM III and

PRISM IV score was calculated to stratify the mortality risk. Every child admitted to PICU was subjected to PRISM III score within 6-24 hours after admission. The PRISM III Score is calculated out of 52, with a single set of 17 Physiological variables with age specific ranges for each variable with 24 hours of admission. Higher the PRISM III score at admission, higher is the risk of mortality. The PRISM IV score was calculated within 4-6 hours after admission. The score is calculated out of 25, with Neurological and Non-Neurological variable Scores derived in PRISM III. There was a wide variation in the diagnosis of the children at admission with Infectious Diseases- Dengue Fever in febrile phase, Dengue fever in Critical phase, Dengue Shock syndrome, Dengue fever with warning signs, Dengue fever with complications like Myocarditis, Pleural effusion, Dengue Hepatitis and Dengue Nephritis and Rickettsial Fever.

Respiratory System- Bacterial Pneumonia, Viral Pneumonia, Upper respiratory Tract Infection, Bronchiolitis Obliterans Organizing Pneumonia with Respiratory Failure and Bronchiolitis; Central Nervous System- Bacterial Meningitis, Traumatic Brain Injury with Subdural Haemorrhage with no Neurodeficit, Traumatic Brain Injury with Subarachnoid Haemorrhage with Neurodeficit, Mild Traumatic Brain Injury with no Parenchymal Haemorrhage, Guillian Barre Syndrome, Hypercalcaemic Convulsions, Febrile Convulsions, Benign Partial Convulsions of Adolescence. Cardiovascular System – Patent Ductus Arteriosus, Ventricular septal defect, Tetralogy of Fallot, Double Outlet Right Ventricle , Viral Myocarditis and Dilated Cardiomyopathy, Haematological- Severe Iron Deficiency Anaemia, Megaloblastic Anaemia, Haemolytic Anaemia, Gaucher's Disease Renal- Acute Kidney injury, Acute glomerulonephritis, Gastrointestinal- Acute Gastroenteritis with some dehydration,

Acute Gastroenteritis with Severe Dehydration, Hepatobiliary- Acute Liver Failure, Viral Hepatitis, Budd Chiari Syndrome, Endocrine- Diabetic Ketoacidosis, Addison's disease, COVID-19- MISC with Myocarditis, Congenital Anomaly- midline defect like Cleft lip and Cleft palate, Immunological- Urticaria, Poisoning- Snake bite and Post- operative care.

At discharge, children were evaluated by the resident Paediatrician using the PCPC score and every consecutive child admitted in the PICU was enrolled in the study till the sample was achieved during the study period. A standard developmental Milestones checklist was used while assessing the PCPC score to avoid subjective bias and maintain uniformity. Every child enrolled was assigned a follow up date after 3 months and a telephonic reminder was given 2 days before the stipulated follow up date. The difference between the PCPC score at discharge and follow up was calculated and categorised into the groups. When the Delta PCPC belonged to Group 2, the enrolled patients were subjected to further Neurological assessment using appropriate scales to assess the neurological dysfunction and were extensively followed up with Paediatric Neurologist, Physiotherapist, Child Psychologist and Speech therapist. (Annexure II)

Involvement of system at admission: The involvement of systems was considered based on the clinical presentation, clinical examination findings, laboratory investigations and primary diagnosis.

Management: The mode of management determined based on routine care (like IV fluid, antibiotics, oxygen supplementation, inotropes, requirement of blood transfusion, immunoglobulins) and special care (like ventilatory support and dialysis). Standard PICU protocols were followed for the management.

Outcome Variables

Delta PCPC (dPCPC)

The dependant outcome variable was Delta PCPC (dPCPC) which was the difference between the PCPC scores calculated at discharge and follow up.

Length of Hospital Stay

The patients were assessed for number of days in hospital from admission to discharge.

Length of Ventilation

The patients were assessed for number of ventilation received from admission to discharge.

PRISM III score

The patients enrolled in the study had their PRISM III score calculated within 6-24 hours of admission. The PRISM III score was later correlated to dPCPC to determine the association.

PRISM IV Score

The patients enrolled in the study had their PRISM IV score calculated within 4-6 hours of admission. The PRISM IV score was later correlated to dPCPC to determine the association.

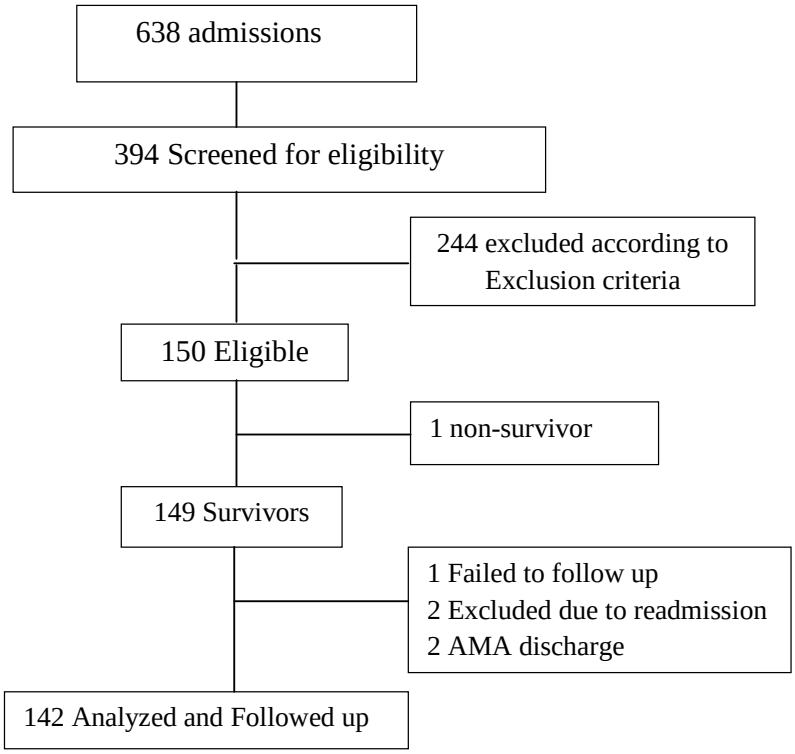
STATISTICAL ANALYSIS: The data obtained was coded and entered into Microsoft excel spreadsheet and data was analysed using SPSS version 20. The categorical data was expressed in terms of rates, ratios and percentages and the continuous data was expressed in terms of mean ± standard deviation. The association between the outcome, clinical and demographic characteristics was tested using Chi-square test. The discrimination between survivors and non survivors was made using the receiver operating characteristic curve (ROC curve). If the AUC (Area under curve) is 0.9 or more its considered excellent discrimination, 0.80-0.89 it considered good and 0.70-0.79 as fair. The accuracy of PCPC scores in determining the neurological outcome was expressed in terms of sensitivity, specificity and positive predictive value. The association in terms of odds ratio was assessed by Chi-square test and by the ROC analysis. The correlation of PCPC scores with PRISM III, PRISM IV, length of ventilation and length of hospital stay was done using Pearson's correlation co-efficient. At 95% confidence interval, a probability (p) value of ≤ 0.050 was considered as statistically significant.

RESULTS

The present prospective cross-sectional study was conducted in the Paediatric Intensive Care Unit of the Department of Paediatrics, teaching hospital attached to KAHER's Jawaharlal Nehru Medical College, Belagavi from January 2021 to December 2021.

Out of 638 admissions to the PICU during the study period, 394 were screened for eligibility and 244 were excluded as per the selection criteria i.e., children with chronic illness (n=212), death at discharge (n=29), Brain death or PCPC Score 6 (n=3). Among the 150 children eligible, 149 were survivors and 1 expired. Out of 149, 2 were excluded from study due to readmission before scheduled follow up, 1 failed to follow up, 2 were discharge against medical advice and 142 were analysed as per the consort diagram (Figure 1).

Figure 1: CONSORT Diagram

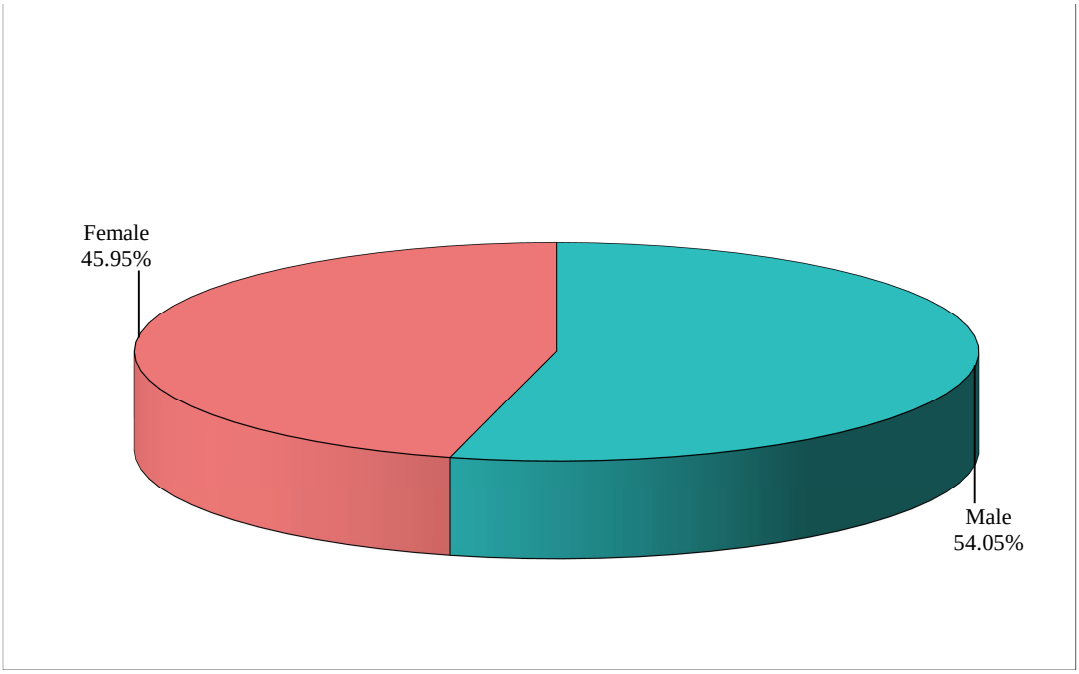


Socio Demographic Profile

1. **Gender distribution**

In the study, 54.05 % were male and 45.95 % were females. The male to female ratio was 1.17:1. The figure 2 shows the distribution of gender among the analysed study population.

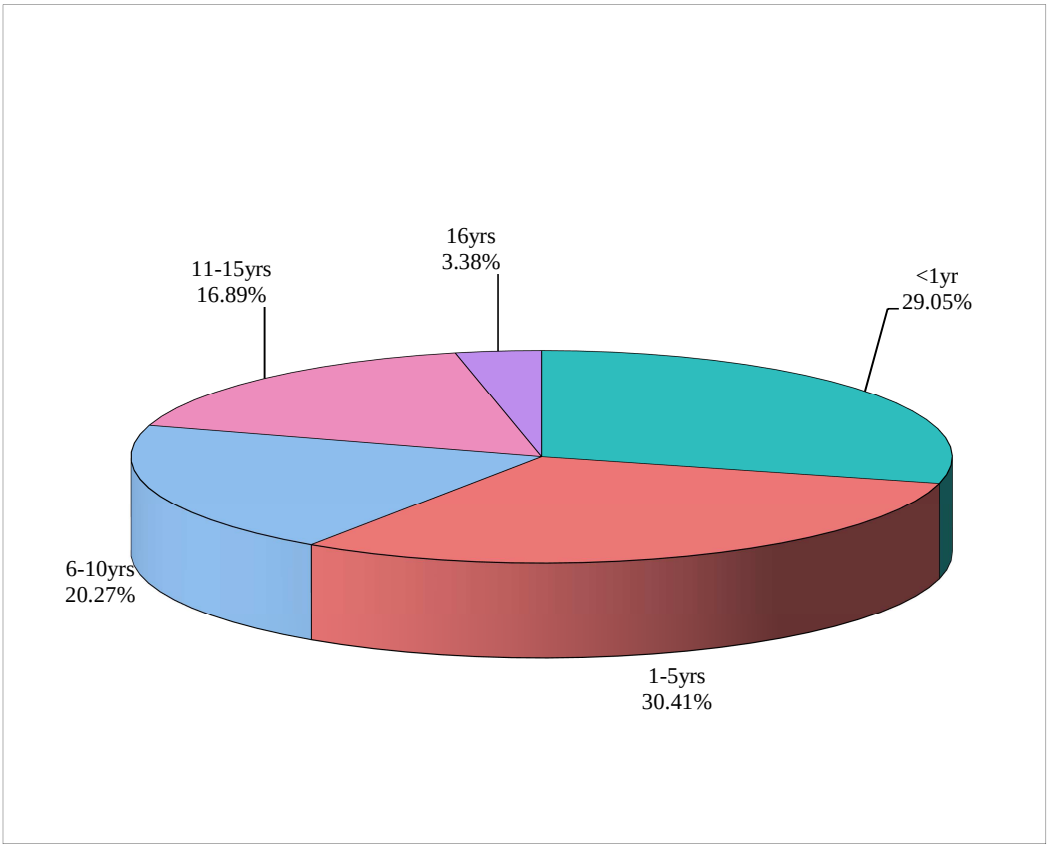
Figure 2: Gender wise distribution of children



2. Age Distribution

In the study, the majority of the participants were in the age group of age group 1-5 years (30.41%, n=45), followed by 1 month to 1 year (29.05%, n=43) and the mean age of study participants was 5.41 years.

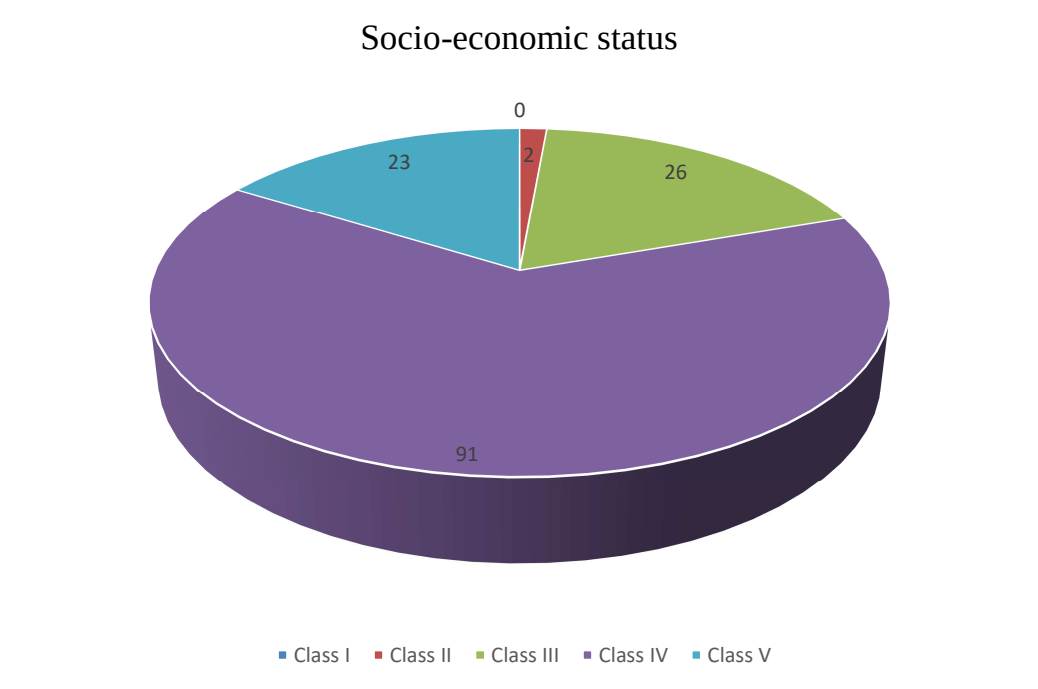
Figure 3: Age wise distribution of children



3. Socio-Economic status distribution:

In our study, majority of the participants belonged to Class IV of Modified B G Prasad scale (64%), followed by Class III (18.3%), Class V (16.19%) and Class II (1.4%).

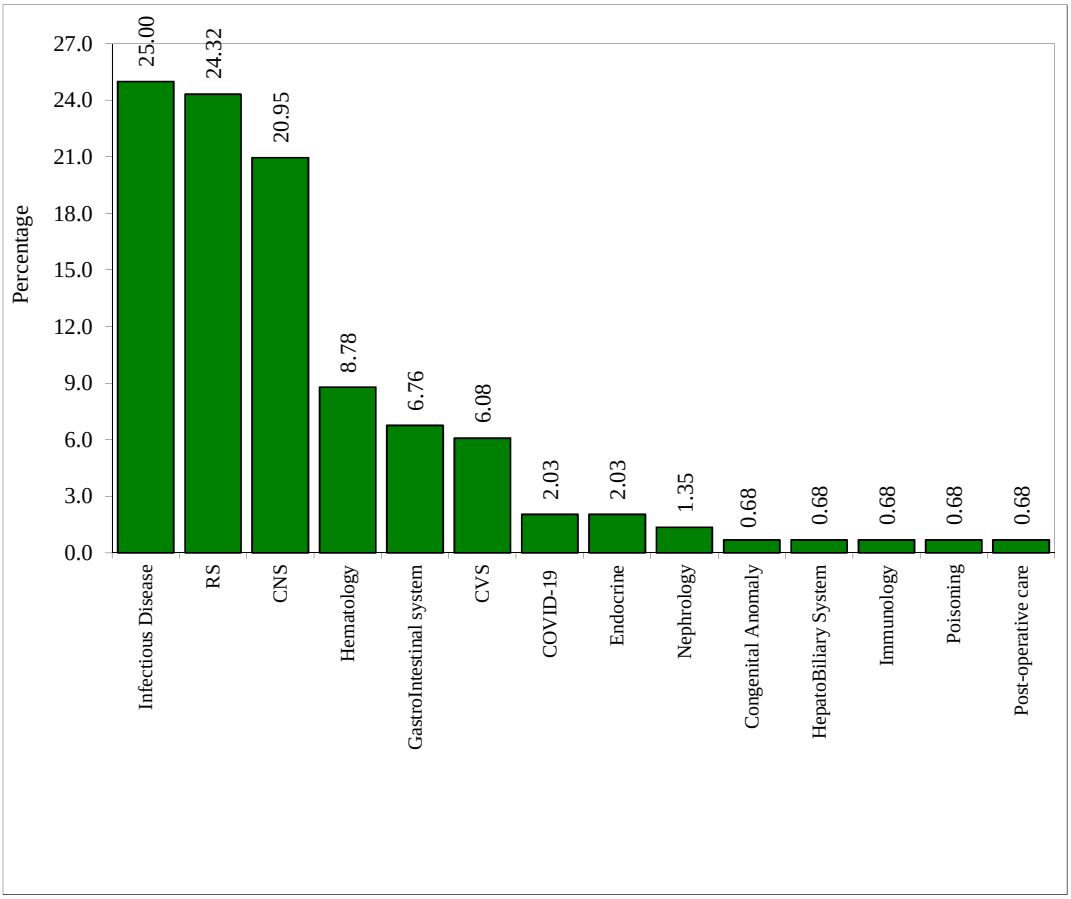
Figure 4. Distribution of Socio-economic status



System Involvement

In the study, majority of the children had Infectious causes (25.00%) followed by Respiratory system (24.32%) and Central Nervous System (20.95%), followed by other systemic involvement (29.73%)

Figure 5. System involved wise distribution of children



Primary Outcome

Paediatric Cerebral Performance Category (PCPC) Score

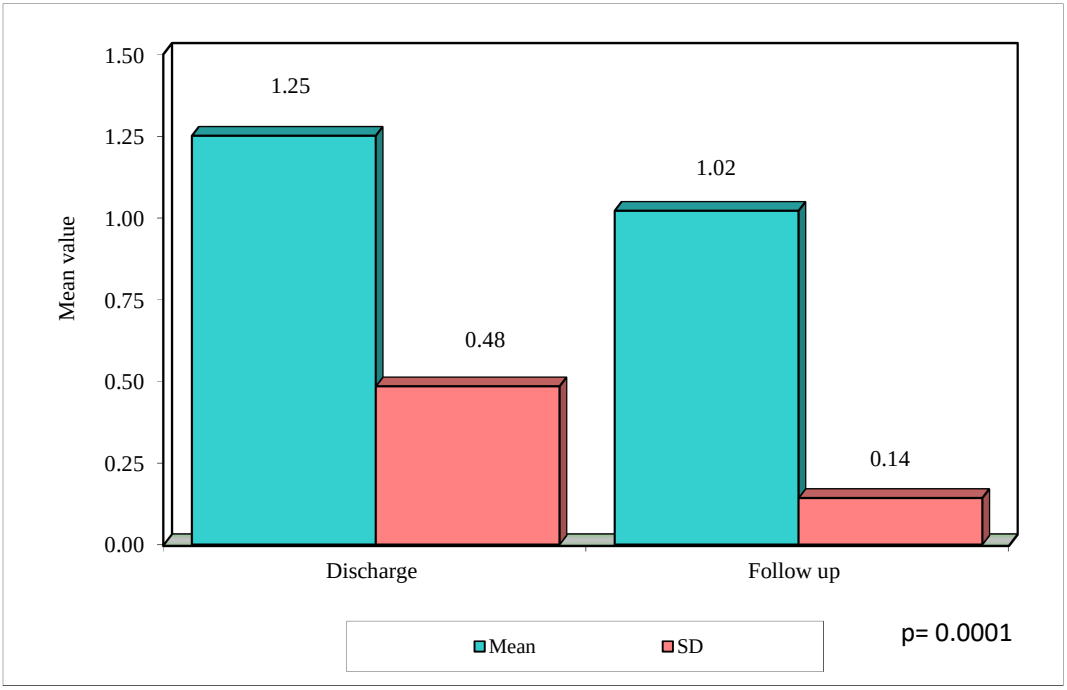
The mean PCPC score at discharge was 1.25 ± 0.48 and at 3 months follow up was 1.02 ± 0.14, the difference was statistically significant (p=0.0001).

Table 1: Comparison of PCPC score at discharge and follow up by Wilcoxon matched pairs test

PCPC scores	Mean	SD	Mean Diff.	SD Diff.	Z-value	P-value
Discharge	1.25	0.48				
Follow up	1.02	0.14	0.23	0.45	4.7821	0.0001*

*p<0.05

Figure 6: Comparison of PCPC score at discharge and follow up scores



Delta PCPC (dPCPC)

The difference between PCPC score at discharge and PCPC score at follow up is known as Delta PCPC (dPCPC). The mean dPCPC score was 1.13 ± 0.31 and was statistically significant

(p= 0.01878).

Table 2. dPCPC score comparison by Chi-square test.

Variable	Mean	SD	Z value	P Value
dPCPC	1.13	0.31	2.35	0.01878

Logistic regression analysis of PCPC score at discharge and 3 month follow up

Cut off value for PCPC score at discharge was 3 and at 3 month follow up was 2. There was a positive association between PCPC scores at discharge and follow up(OR =34.48 (>1.0)). The sensitivity for PCPC score to determine Neurological dysfunction was 33.33% and Specificity was 98.57%. The Positive Predictive value was 33.33% and Prevalence of Neurological dysfunction was 2.1%. Accuracy of PCPC score in determining Neurological dysfunction was 97.18%.

Table 3. Logistic regression of PCPC score at discharge and 3 month follow up

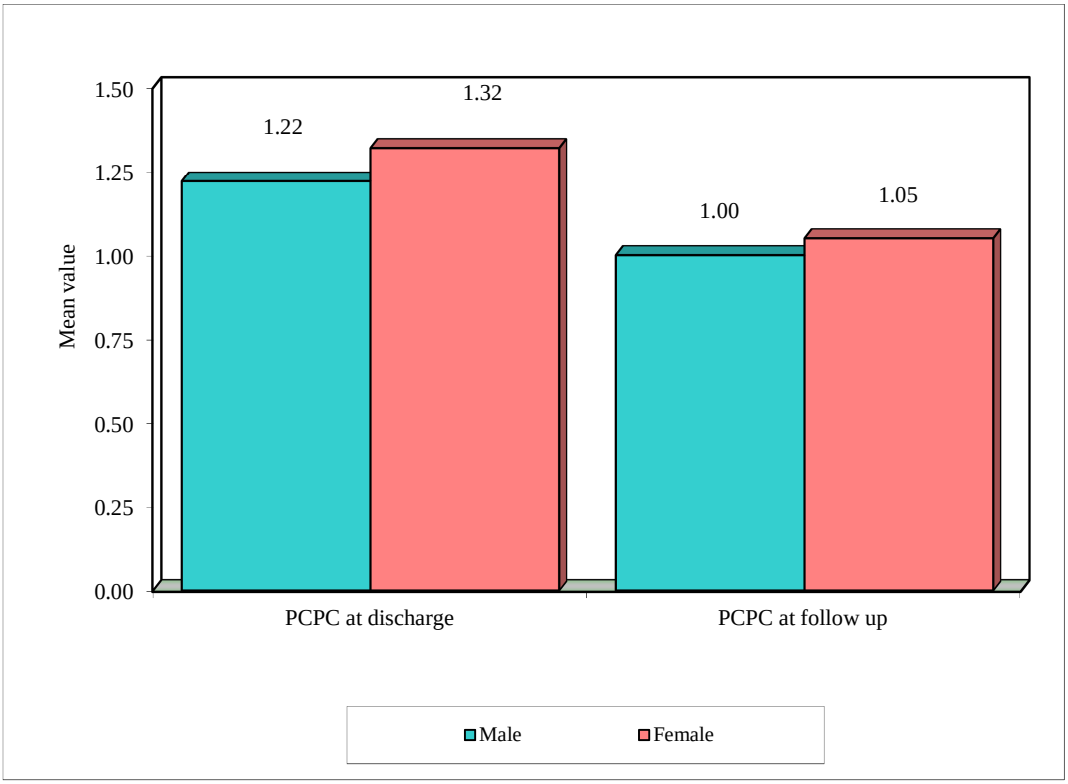
Parameters	**PCPC at discharge**	**PCPC at 3 month Follow up**
Cut- off value	>/= 3	>/= 2
Odd's ratio	34.48	
Sensitivity	33.33%	
Specificity	98.57%	
Positive Predictive value	33.33%	
Prevalence	2.1%	
Accuracy	97.18%	

PCPC scores correlation with Sociodemographic data

dPCPC score and gender distribution

In our study, there was no significant difference in mean PCPC score at discharge and follow up according to gender distribution (p=0.48, p= 0.63). There was no significant difference in dPCPC score according to gender distribution (p = 0.59).

Figure 7: Comparison of male and females with PCPC score at discharge and follow up scores



dPCPC and age

In the study, mean age was positively correlated to dPCPC and was statistically significant

(Spearman R= 0.1938, p=0.0208).

Table 4: Correlation between age in years with other variables by Spearman's rank correlation

Variables	Spearman R	t-value	p-value
dPCPC	0.1938	2.3372	0.0208*

*p<0.05

dPCPC and System Involved

dPCPC score was not significantly correlated with the systems involved. However, Group2 (2 category decline) was noted in 2 patients with Central Nervous System and Respiratory System involved. Majority of Group 1 (1 category decline) was observed in 16 children with CNS involved, followed by Haematology (n=5).

Table 5: Comparison of dPCPC with System involved

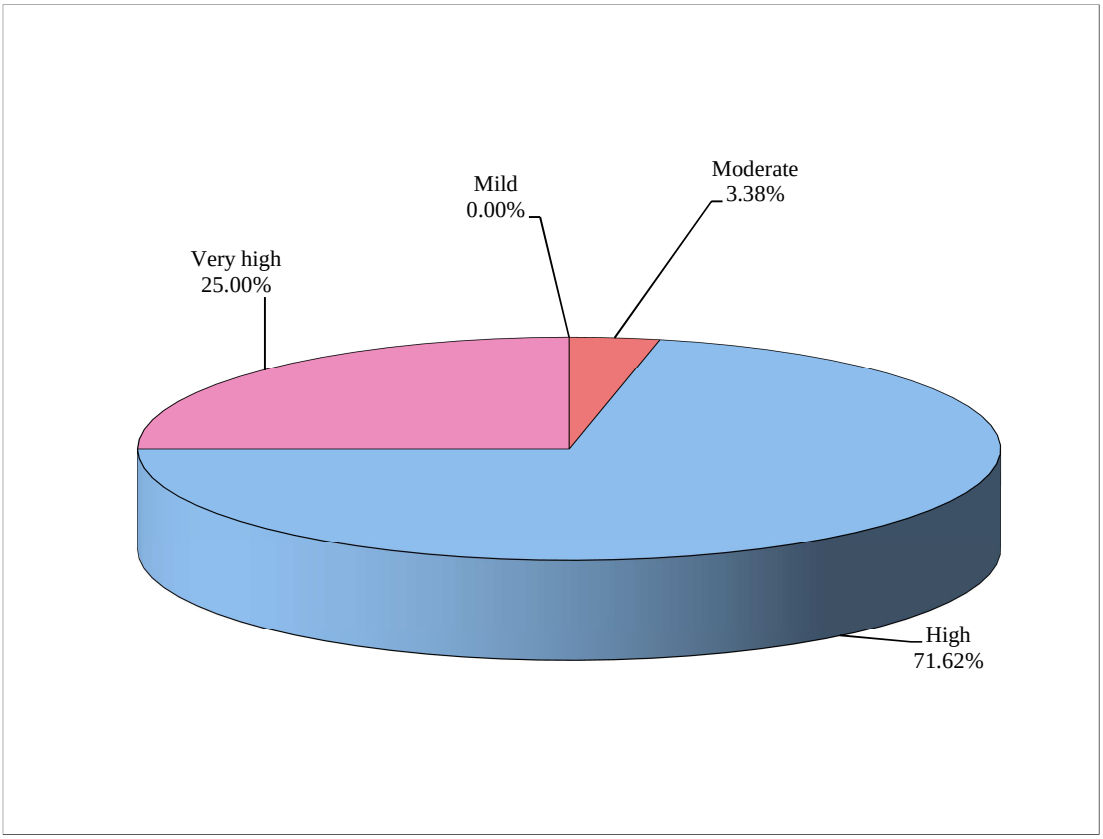
System involved	Group 0	%	Group 1	%	Group 2	%	Total
CNS	13	43.33	16	53.33	1	3.33	30
Congenital Anomaly	1	100.00	0	0.00	0	0.00	1
COVID-19	1	100.00	0	0.00	0	0.00	1
CVS	7	87.50	1	12.50	0	0.00	8
Endocrine	1	33.33	2	66.67	0	0.00	3
GastroIntestinal system	8	100.00	0	0.00	0	0.00	8
Hematology	8	61.54	5	38.46	0	0.00	13
HepatoBiliary System	1	100.00	0	0.00	0	0.00	1
Immunology	1	100.00	0	0.00	0	0.00	1
Infectious Disease	37	100.00	0	0.00	0	0.00	37
Nephrology	2	100.00	0	0.00	0	0.00	2
Poisoning	1	100.00	0	0.00	0	0.00	1
Post-operative care	1	100.00	0	0.00	0	0.00	1
RS	33	91.67	2	5.56	1	2.78	36

Secondary outcomes

PRISM III SCORES

In our study, 71.62% (n=106) of the children analysed had High risk of mortality on admission. The mean PRISM III Score was 28.34 ± 4.65.

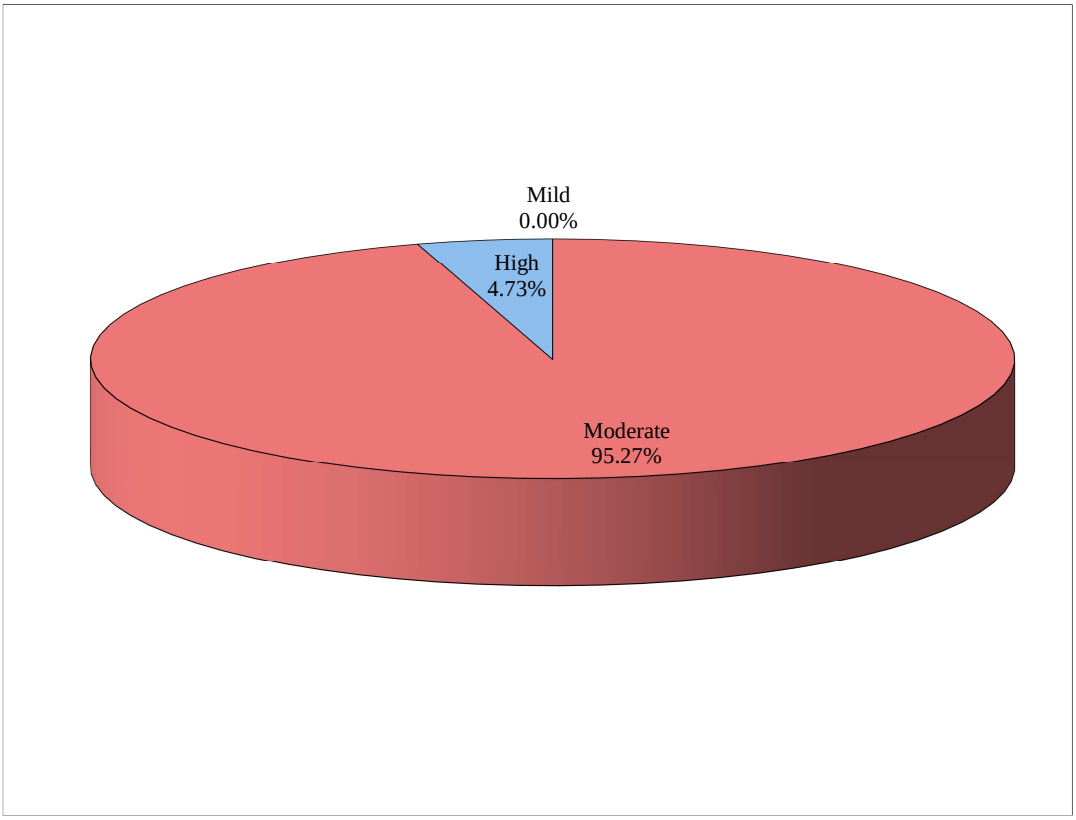
Figure 8: Levels of PRISM III



PRISM IV Score

In our study, 95.27% (n=141) of the analysed children had Moderate risk of mortality and 4.73% (n=7) had High risk of mortality according to PRISM IV Score. The mean PRISM IV score in the study was 16.44 ± 2.15.

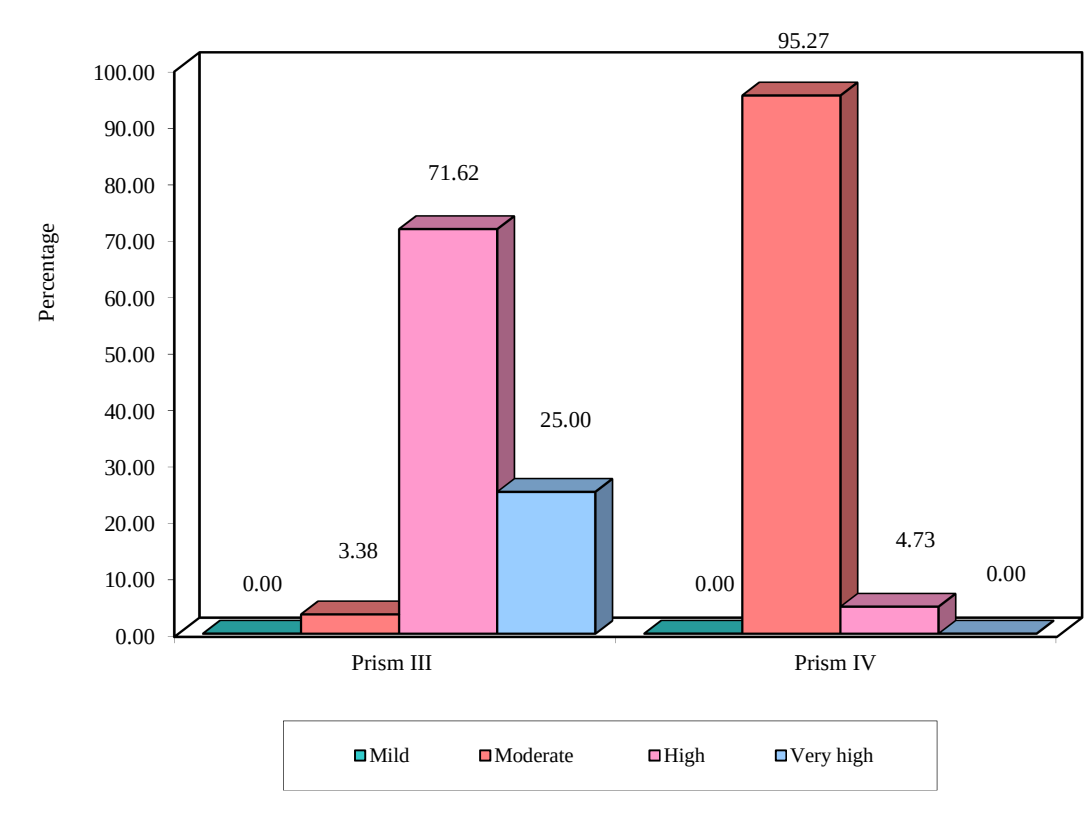
Figure 9: Levels of PRISM IV



Comparison of Levels of PRISM III and PRISM IV.

In our study, PRISM III and PRISM IV was calculated with 4-6 hours of admission to predict severity of acute illness requiring PICU admission. 71.62% (n=106) of the analysed population had High Risk according to PRISM III Score correlating with Moderate risk of PRISM IV. 21.27% (n=30) had Very High PRISM III score correlating with Moderate PRISM IV Score. 4.9% (n=7) had Very High PRISM III score correlating with High PRISM IV Score. 3.38% (n=5) had Moderate PRISM III Score correlating with Moderate PRISM IV Score.

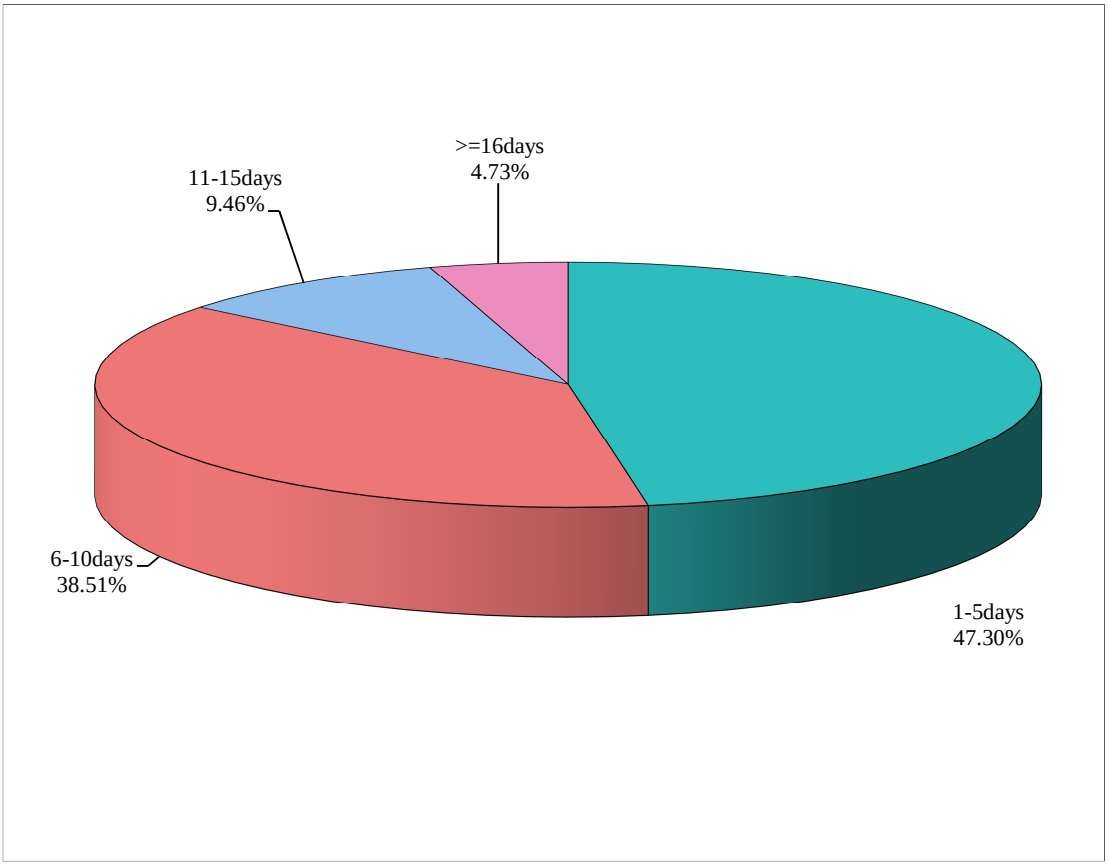
Figure 10: Comparison of levels of PRISM III and PRISM IV



Length of Hospital Stay

In our study, majority of the study participants had hospital stay for 1-5 days (47.30%, n=70), followed by 6-10 days (38.51%, n=57) and the mean length of hospital stay was 7.43 ± 6.46 days.

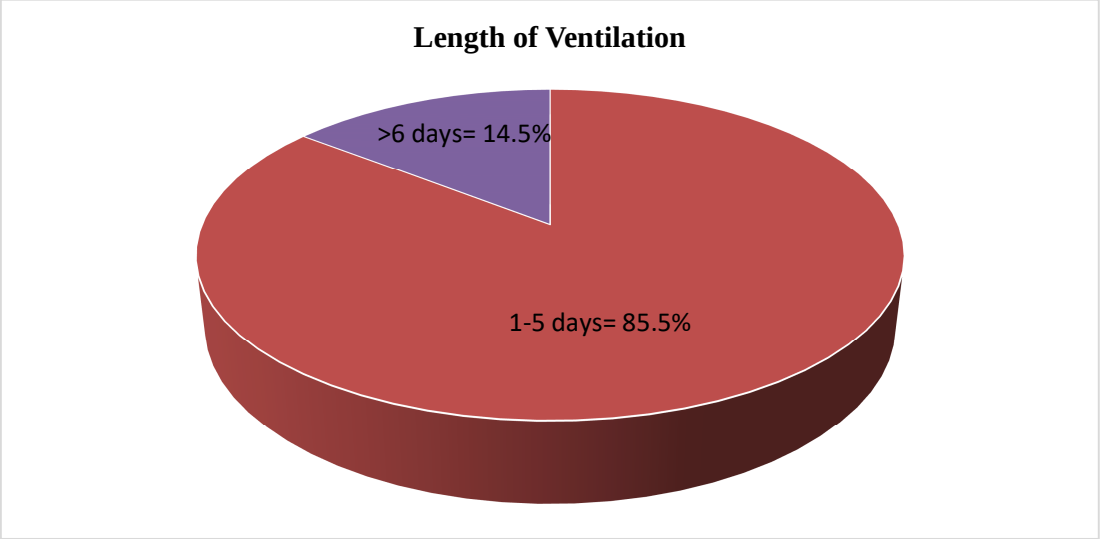
Figure 11: Length of hospital stay wise distribution of children



Length of Ventilation.

In the study, amongst those who received ventilation support during the hospital stay, majority had duration of ventilation for 1-5 days (85.5%) followed by > 6 days (14.5%). The mean length of ventilation received was 4.6 days with a standard deviation of 6.7.

Figure 12: Length of ventilation wise distribution of children



Correlation of dPCPC with secondary outcomes.

In our study, dPCPC had a positive correlation with length of hospital and PRISM III score (OR=1.11, OR=1.14). Longer the Hospital stay and higher the PRISM III score at admission, severe is the Neurological dysfunction. Length of ventilation and PRISM IV score had negative correlation with dPCPC (OR= 0.97, OR=0.70). Although, PRISM IV was significantly correlated with dPCPC (p=0.0120)

Table 6: Multiple logistic regression analysis of dPCPC scores by other parameters

Independent variables	Adj. OR	95% C.I. for OR		p-value
		Lower	Upper	
Length of Hospital Stay	1.11	0.97	1.27	0.1270
Length of Ventilation	0.97	0.82	1.16	0.7660
PRISM III	1.14	0.97	1.32	0.1040
PRISM IV	0.70	0.54	0.93	0.0120*

*p<0.05

Sensitivity and Specificity of dPCPC

The Sensitivity and Specificity of various independent parameters for predicting dPCPC was calculated. The cut off points for each parameter was defined as the highest observed data and specificity, sensitivity and Positive Predictive value was calculated.

For the highest observed PRISM III score (cut off value=29), dPCPC score had sensitivity of 70.43%, specificity of 66.67% and Positive predictive value (PPV) of 34.62 to predict Neurological dysfunction.

For the highest observed PRISM IV score (cut off value=18), dPCPC score had sensitivity of 83.48 %, specificity of 51.85% and Positive predictive value (PPV) of 42.42 to predict Neurological dysfunction.

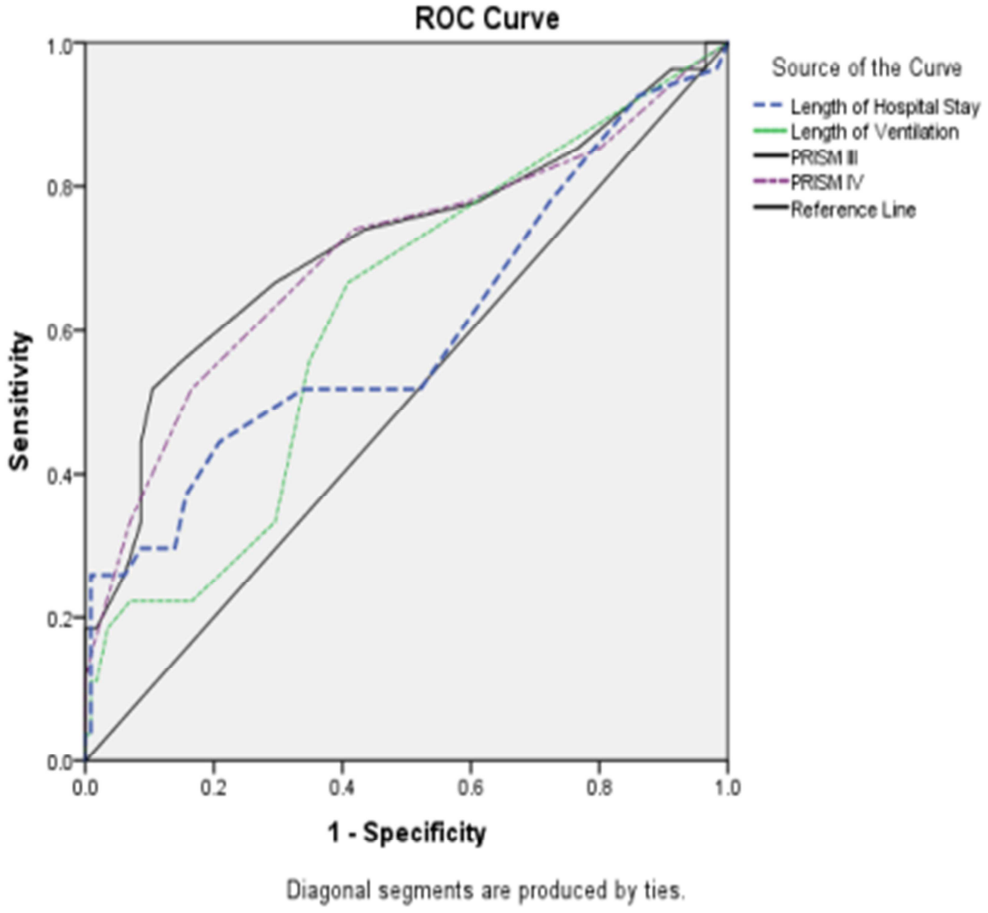
Table 7: Sensitivity, Specificity and cut off point for various parameter values in prediction of dPCPC

Summary	Length of hospital stay	Length of ventilation	PRISM III	PRISM IV
Cut-off point	>=7.00	>=3.00	>=29.00	>=18.00
Specificity	0.5185	0.3333	0.6667	0.5185
Sensitivity	0.6601	0.7043	0.7043	0.8348
Positive predictive value	0.2624	0.2093	0.3462	0.4242
Correctly classified	0.6338	0.6338	0.6972	0.7746

ROC curve for dPCPC in predicting outcomes.

In the study, Receptor Operative curve for predicting Neurological dysfunction was plotted with the highest cut off value for PRISM III, PRISM IV, length of ventilation, Length of Hospital Stay. PRISM III (AUC= 0.71) and PRISM IV (AUC= 0.70) had fair Area under curve (AUC). (If the AUC is 0.9 or more it considered excellent discrimination, 0.80-0.89 it considered good and 0.7-0.79 is considered fair.

Figure 13: Receptor Operative curve of dPCPC



DISCUSSION

With the evolving Pediatric Critical care and the decreasing mortality contributed by advancements in technology and use of standard protocols, the focus of care has shifted to morbidity with favorable outcomes. The morbidities have outcomes such as Respiratory, Circulatory, Neurological, Metabolic, Post-Tracheostomy Hoarseness, Scars and Post- Thrombotic Syndrome, out of which neurological outcomes affect the growth and development of children.[1] The neurological outcomes are assessed using various Functional Status Scales (FSS) namely Paediatric Cerebral Performance Category Score (PCPC) and Paediatric Overall Performance Category Score (POPC) which are objective and unbiased to screen the children at discharge and at follow up to avoid the sequelae.[6] We conducted the study in PICU of a tertiary care teaching hospital to evaluate the neurological outcomes using PCPC score.

Socio-demographic characteristics

In the study, majority of the participants were male with the mean age of 5.41 years and belonging to Class IV socio-economic status. Similar socio-demographic observations were reported by studies conducted to analyze the outcomes of PICU in both developing and developed countries. [52,53]

A prospective observational study by Volkali E et al, in a PICU of a Tertiary Care hospital in Greece, reported similar observations of demographic profile showing preponderance of male gender (64.6%), mean age of 4.5 years[47]. A retrospective comparative study conducted to characterize and study the outcomes in two Paediatric Intensive Care units with different resources in developed or

developing countries reported similar demographic profile of male preponderance. However, the study reported mean age of 2.6 years which was lesser than our observed mean age. [11]

Several Indian studies also have reported similar observations of the demographic profile and socioeconomic status. A prospective observational study carried out in a PICU of a tertiary care rural Hospital in India to evaluate the outcome, showed male preponderance, mean age of 5.2 years and majority belonging to lower socio-economic status. [53]

Systems Involved

The major cause of illness in our study was of infectious origin (25.0%) (Dengue fever, Rickettsial fever) followed by respiratory (24.32%) and neurological causes (20.95%) (convulsions, altered sensorium, Traumatic Brain Injury). A systematic review of Neurological Outcomes of Paediatric Critical care studying 66 articles over 4 years observed infectious causes (28%) as the major cause of acute illness needing PICU care, similar to our observations.[1] However, a prospective 3 month follow up study in a Tertiary PICU in Netherlands evaluating the outcomes of PICU in 186 children reported Respiratory illness (41%) followed by Neurological illness (12%) as the leading causes of PICU admissions [3].

Primary Outcome

In our study, there was a significant difference between the mean PCPC score at discharge and follow up at 3 months (1.25 ± 0.48 vs 1.02 ± 0.14, p= 0.0001). Delta PCPC (dPCPC) was statistically significant implicating that there was a difference between PCPC score at discharge and follow up (p=0.01878).

Several Studies evaluating Neurological Outcomes using Functional Status Scales have also reported similar significant difference in the PCPC scores at follow-up indicating improvement in the neurological status. A retrospective comparative study evaluating the outcomes in two Paediatric Intensive Care units with different resources in developed and developing countries, with similar demographic profile as our study using PCPC for assessing neurological outcome reported similar observations of reduction of PCPC score at 3 months follow up by 73% [47]. A 2-year longitudinal cohort study evaluating the functional and neuropsychological outcomes using PCPC at 3-6 months and 24 months in 49 patients admitted to PICU after Out of Hospital Cardiac arrest (OHCA), observed good (1-2) PCPC scores at 3-6 months and 24 months. At 3-6 months and 24 months, out of 49 patients ,85% remained with good PCPC scores and 10% with poor Scores and 5% improved from poor to good scores. The results of this study are similar to our observations. [48] A 2-year retrospective, descriptive study of functional status of 266 paediatric patients admitted to a PICU of a tertiary care hospital in Spain, receiving neurointensive treatment showed significant improvement of the PCPC scores at one year follow-up assessment [48.]

Contrary to our observations of PCPC scores at follow-up compared to baseline or at discharge many studies evaluating Neurological Outcomes using Functional Status Scales have reported higher scores at follow-up than at discharge indicating no improvement or worsening in the neurological status [48]. A prospective observational study from Toronto evaluating the functional outcome of the PICU patients using PCPC and POPC in 91 children followed upto 1 month, reported no significant change in the PCPC scores at 1 month compared to baseline scores. At 1 month follow up only 22% of subjects had PCPC ≥3. This observation in the study

was attributed to more number of patients admitted to PICU with neurological involvement, worse PCPC scores at baseline and longer ICU stay.[12] A prospective cohort study to evaluate the long-term outcome of the paediatric critical care patients using Functional status scales, reported worsening of the PCPC scores at follow-up assessments upto 3 years post-discharge. At 6 month follow up 37.7% of the subjects, 10% worsened, remained unchanged in 44.1% and improved only in 9%. The study reported that patients with worsening scores had longer ICU stay and required longer duration of mechanical ventilation. [13]

The studies showing no change in the PCPC scores at follow-up had different functional status of the patients admitted to the PICU in terms of severity of illness with higher risk of mortality, prolonged PICU stay, requiring more number of mechanical ventilation and other interventions in the ICU. These observations are attributed as the reason for no improvement in the scores. [48,50,51]

The sensitivity of PCPC score in our study to evaluate Neurological dysfunction at 3 months follow up was 33.33% and Specificity was 98.57% and Accuracy of PCPC score in determining Neurological dysfunction at 3 months follow up was 97.18%, indicating that PCPC is a specific and accurate functional scale to evaluate the outcomes of neurological dysfunction at discharge and at 3 month follow up in an Indian setting. A 18 month long prospective study done by Debra Henry Fiser in PICU unit of Arkansas Children's Hospital in 1469 children admitted with acute illness in PICU to measure the short-term physical and cognitive disability after critical illness or injury in children using new functional status scales reported POPC and PCPC to be apparently reliable and valid tools for assessing the outcome of Paediatric intensive care with an excellent intraclass correlation coefficients ranged

from 0.88 to 0.96 for the rater pairs (p <0.001). However, there are no Indian studies to compare the accuracy of the PCPC scores in our settings.

In our study, the mean age had significant correlation with dPCPC (p=0.0208, Spearman R=0.1938) whereas, the demographic characteristics like gender and Socio-economic status did not show any significant correlation with dPCPC. Children presenting to PICU with Neurological and Respiratory system involvement had higher PCPC scores at discharge than follow up similar to other studies with similar demographic profile and system involvement at discharge. [47.48.49]

Secondary outcomes

In our study, we evaluated PRISM III, PRISM IV, length of ventilation and duration of Hospital stay and correlated the observations with dPCPC. The mean PRISM III Score was 28.34 ± 4.65 and 71.62% had High risk of mortality on admission. The mean PRISM IV score in the study was 16.44 ± 2.15 and 95.27% had Moderate risk of mortality. The observations confirm that PRISM III and PRISM IV score are accurate and valid scales to predict the mortality outcomes in patients admitted to PICU as reported earlier by studies both from developed and developing countries. Similar observations were reported by a previous study conducted in the same centre to predict outcomes of PICU using PRISM III score. [53] The higher risk of mortality was observed with PRISM 3 score of >/= 25 (95%). Similar observations are reported by other Indian studies. [52]

A 2-year hospital-based prospective study evaluating the accuracy of PRISM III score in predicting the mortality outcomes in a PICU in Karachi in patients between the age of one month and 12 years, PRISM III score at 24 hours of admission showed higher risk of mortality with PRISM III score cut off at 28 with an excellent AUC of 0.903±0.016 (p<0.001, 95% confidence interval: 0.872-0.934).

In our study, the mean length of hospital stay of the participants was 7.43±6.46 days. This longer duration of hospital stay may be due to prolonged length of mechanical ventilation in the study participants and higher risk of mortality as predicted by PRISM III and PRISM IV scores. Other Studies evaluating outcomes of PICU patients using functional scales have reported a lesser length of hospital stay compared to our study. A prospective 2-year study from Karachi have reported a mean length of hospital stay of 3.37 days and higher risk of mortality within observed mean length of hospital stay and the Functional Status had a positive correlation with longer duration of PICU stay.[54] Similar results have been reported by another retrospective study from a resource limited setting in a developing country wherein the average length of Hospital Stay observed was 5.3 ±3.9 days. [11]

In our study we observed the mean length of ventilation of 4.6 ±6.7 days. Several studies evaluating functional outcomes using PCPC scores have reported a longer duration of ventilation compared our study. The mean length of ventilation was 7.3± 4.9 days observed in study conducted in a PICU in a resource limited setting in a developing country, which was longer than our observations. Children with prolonged ventilation had presented to PICU with Respiratory diseases and Neurocritical illness (11) A prospective study done in PICU to establish the reliability and validity of PCPC score used to assess physical and cognitive disability after critical illness, reported that higher PCPC scores were observed in children with longer duration of ventilation and longer PICU stay. (p= 0.00128, p=0.00276). [49]

In our study, dPCPC had high sensitivity (70.43%) and Specificity (66.67%.) in evaluating neurological outcomes in children with PRISM III Score (>/=29). A significant correlation of PCPC scores with higher PRISM scores. ($p<0.0001$) was

reported by a study from a developed country validating the functional outcome scales.[49] However, there are no studies correlating the PCPC with Mortality Prediction scores. Various studies with larger sample size validating PRISM III and PRISM IV score have reported that the PRISM III score of >/=29 and PRISM IV score of >/= 18 had higher mortality risk, longer stay in PICU with prolonged ventilatory support and severe neurological dysfunction at discharge and follow-up[15,16,17] . No similar studies are reported from India.

In our study, there was a negative correlation between PRISM IV score at admission and dPCPC, the Odd's ratio was 0.70 (95% CI 0.54 to 0.93, p= 0.0120) which states that with increase in PRISM IV score there was less difference between PCPC score at discharge and follow up and no significant improvement in Neurological outcomes at 3 month follow up. Although, it was observed with PRISM IV score (>/= 18), dPCPC had high sensitivity (83.48%) to determine Neurological dysfunction. However, there are no studies to correlate PRISM IV score with dPCPC.

To evaluate the neurological outcome using dPCPC from PRISM III and PRISM IV score calculated at admission, Receptor Operator Curve (ROC) was plotted which showed maximum sensitivity and specificity at cut-off of 29 and 18 respectively. PRISM III (AUC= 0.71) and PRISM IV (AUC= 0.70) had fair Area under curve (AUC) and positively correlated to dPCPC.

Hence it can be predicted that high dPCPC is associated with high PRISM III and PRISM IV scores and longer duration of hospital stay. It was observed in our study that children with high risk of mortality (high PRISM III and PRISM IV scores) had severe neurological dysfunction which did not show significant improvement at 3

month follow up and may need a long term follow up to assess the neurological outcome.

To conclude, the present study showed that PCPC is a specific and accurate functional scale to evaluate the outcomes of neurological dysfunction at discharge and at 3 month follow up in an Indian setting. There was a significant difference in the PCPC scores at follow-up indicating improvement in the neurological status. The study also showed a positive correlation of PCPC with mean age, system involved, Mortality Prediction scores (PRISM III, PRISM IV), length of ventilation and length of hospital stay.

Strength of study

It is an observational study with a 3 month follow up to evaluate Neurological dysfunction following PICU care using PCPC score and validate it's use first time in Indian settings. The study design and statistical analytic methods are the strengthens of the study.

Limitations

The limitation of the study is that the findings were based on the data from a single centre and with small sample size. Longer follow-up to evaluate the neurological outcomes using PCPC scale would be appropriate and so short-term follow-up at only 3 months is a limitation of the study.

Recommendations

Multicentric study involving larger sample size with long term follow up is recommended.

CONCLUSION

This cross-sectional maiden study was conducted in PICU of a tertiary care hospital attached to a teaching institute in North Karnataka to evaluate the neurological outcomes of patients admitted to PICU with acute illness using PCPC score at discharge and follow up. The study showed that PCPC is a specific and accurate functional status scale for use in PICU in an Indian setting, which is first of its kind. The study also showed a positive correlation of PCPC with mean age, system involved, Mortality Prediction scores (PRISM III, PRISM IV), length of ventilation and length of hospital stay. Multicentric study with a larger sample size and long term follow up is recommended.

SUMMARY

A one-year observational study was done in PICU to evaluate the Neurological outcomes using Paediatric Cerebral Performance Category (PCPC) score. A total of 142 eligible children admitted in PICU were analysed at discharge and follow up at 3 months.

- 54.05 % were male and 45.95 % were females and the male to female ratio was 1.17:1. Majority 64% (n= 91) belonged to Class IV of Modified B G Prasad scale.
- The mean age of study participants was 5.41years.
- Majority of the study participants had Infectious cause (25.0%), 24.32% had Respiratory system, 20.95% had Central Nervous system.
- Primary outcome: The mean PCPC score at discharge and at 3 months follow up was statistically significant.
- Mean dPCPC score was 1.13± 0.31 and was statistically significant (p= 0.01878).
- A positive association between PCPC scores at discharge and follow up was observed. The sensitivity for PCPC score is 33.33% and Specificity is 98.57%. The Accuracy of PCPC score in determining Neurological dysfunction is 97.18%.
- There was no significant difference in dPCPC score of males and females.
- A positive correlation of dPCPC with mean age was observed.
- Highest dPCPC (Group2= 2 category decline) was noted in 2 patients with Central Nervous System and Respiratory System involved.
- Secondary Outcomes:

- The mean PRISM III Score was 28.34 ± 4.65. 95.27% (n=141) of the analysed children had Moderate risk of mortality.
- The mean PRISM IV score in the study was 16.44 ± 2.15. 4.73% (n=7) had High risk of mortality according to PRISM IV Score.
- The mean length of hospital stay was 7.43 ±6.46 days.
- The mean length of ventilation received was 4.6 ±6.7 days.
- The dPCPC score had significant positive correlation with PRISM III. (p value=0.0120)
- There is a positive association of dPCPC with length of hospital stay and PRISM III score (OR= 1.11, OR= 1.14).
- With the cut off value of 29 for PRISM III score, dPCPC score had sensitivity of 70.43%, specificity of 66.67% and Positive predictive value (PPV) of 34.62 to determine Neurological dysfunction.
- With the cut off value of 18 for PRISM IV score, dPCPC score had sensitivity of 83.48 %, specificity of 51.85% and Positive predictive value (PPV) of 42.42 to determine Neurological dysfunction.
- PRISM III (AUC= 0.71) and PRISM IV (AUC= 0.70) had fair Area under curve (AUC). (If the AUC is 0.9 or more it considered excellent discrimination, 0.80-0.89 it considered good and 0.7-0.79 is considered fair.)
- The highest dPCPC score was observed in children with high PRISM IV score, prolonged ventilation and longer hospital stay.

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ANNEXURE I

CONSENT FOR PARTICIPATION IN RESEARCH

"EVALUATION OF NEUROLOGICAL OUTCOMES USING PAEDIATRIC CEREBRAL PERFORMANCE CATEGORY (PCPC) SCORE AFTER CARE IN PICU AT KLES DR. PRABHAKAR KORE HOSPITAL AND M.R.C, BELAGAVI- A 1 YEAR CROSS SECTIONAL STUDY"

Principal Investigator: Dr.

Co – investigator: Dr. , PG student, Department of Paediatrics.

NAME OF THE PARTICIPANT: _____

You have been asked to involve your child in the above said research to be conducted at PICU of KAHER JN medical college hospital, Belagavi by Dr. ********* *******, PG student in the Department of Paediatrics at Jawaharlal Nehru Medical College, Belagavi.

PURPOSE OF THE STUDY: Participation of your child will help us to Evaluate the use of PCPC score in assessing Neurological outcomes after care in PICU.

You are free to discontinue the participation in the study at any time for any reasons and you will not be paid any reimbursement for participation in the research. Hence involving your child in the study is your voluntary decision.

Voluntary participation: Your child's participation in this study is your voluntary decision, whether or not to participate will not affect your current or future relationship with KLES Dr. Prabhakar Kore Hospital & MRC, Belagavi.

Risk and benefits: There are no risks involved.

Privacy and Confidentiality: The only people who will know that you are a research participant are member of the research team. No information about you or provided by you, during research will be disclosed to others without your written consent. When the results of the research are published or discussed in the conferences, no information will be disclosed that would reveal your identity. Any information obtained in connections with this study and that can be identified with you remain confidential and will be disclosed only with your permission.

Payment for participation: The participants or the parents wouldn't be given any incentive to participation in the study.

Queries

If you have any queries you may contact

Dr. ***** *****, Post Graduate Student**

Department of Paediatrics

JNMC ,Belagavi-590010

Phone No. **********

DR. *** * ****** MD DCH**

PROFESSOR

DEPARTMENT OF PAEDIATRICS,

JNMC ,Belagavi-590010

Phone No.****-******* Ext no.

If you have any questions about your rights or research participation you may contact

Chairman ethical committee:

DR. HARSH HEGDE

CHAIRPERSON, JNMC,

IEC & SCIENTIST D,

ICMR, NATIONAL INSTITUTE OF TRADITIONAL MEDICINE,

BELAGAVI- **********

You will be given a copy of this form for your information and to keep for your records.

STATEMENT OF CONSENT

I hereby voluntarily agree for my participation in this study. I understand that even if I have the liberty to withdraw at any time. My signature below indicates that I have read or have been told in the language I understand, about this entire consent form including the risks and benefits and have had all my questions answered. I will be given a copy of this consent form.

Name of Participant: _____

Age: **Gender:**

Verbal/oral assent of participant (Age 7-12 years)- _____

Signature of participant(Age 13-18 years) -_____

Date : _____

Signature of the authorised representative/ parent: _____

Date: _____

Name: _____

Relation to the Subject: _____

Signature of the witness:_____

Date: _____

Name: _____

Signature of investigator:_____

Date: _____

Name: _____

ANNEXURE II

SCREENING PROFORMA

Title: EVALUATION OF NEUROLOGICAL OUTCOMES USING PAEDIATRIC CEREBRAL PERFORMANCE CATEGORY (PCPC) SCORE AFTER CARE IN PICU AT KLES DR. PRABHAKAR KORE HOSPITAL AND M.R.C, BELAGAVI- A 1 YEAR CROSS SECTIONAL STUDY

Patient IP no.-	
Study ID no.-	

I. General Information:

- **Name-**
- **Age-** **Gender-**
- **Father's name-**

  Occupation-
- **Mother's name-**

  Occupation-
- **Address-**
- **Contact details-**

II. Inclusion/Exclusion Criteria

Inclusion Criteria		Exclusion Criteria	
• Patients admitted to PICU		• Known chronic illness	
• Previously normal children		• Patients admitted to NICU	
• No chronic illness		• Death at discharge.	
• Admission for Acute illness		• Discharge against Medical Advice	
		• Score 6 at Discharge (Brain death/Death)	

Consent for study:

Eligibility for Study :

Proforma for Thesis

TITLE: EVALUATION OF NEUROLOGICAL OUTCOMES USING PAEDIATRIC CEREBRAL PERFORMANCE CATEGORY (PCPC) SCORE AFTER CARE IN PICU AT KLES DR. PRABHAKAR KORE HOSPITAL AND M.R.C, BELAGAVI- A 1 YEAR CROSS SECTIONAL STUDY

- **At Admission:**

Chief complaints

History of presenting illness

Past history:

Family History:

Developmental history:

1. Birth History:

ANTENATAL

TORCH Infections	PIH/PAH
Other Infections	ANC
Intake of Drugs	Diabetes/Convulsions
Radiation	Others

NATAL:

Place of Birth: Birth Wt.: GA:

Type of Delivery: LSCS/ NVD/ FORCEPS/VENTOUSE

Indication for LSCS:

APGAR :

POST-NATAL

BN/HIE. Jaundice

Feeding Difficulty. RDS

Infections. Others

VACCINES	PRIMARY	BOOSTER
BCG		
OPV		
PENTAVALENT		
MMR		
HEPATITIS		
TYPHOID		
OTHERS		

DEVELOPMENTAL HISTORY:

	EXPECTED	OBSERVED
GROSS MOTOR		
FINE MOTOR		
SOCIAL		
LANGUAGE		

DIET HISTORY:

1. Examination

i. Physical Examination

Temperature-

HR- RR-

BP- Spo2-

Pallor. Oedema

Clubbing. Cyanosis

Lymphadenopathy

Other findings-

ii. Anthropometry

Parameters	**Observed**	**Expected**	**Percentile**
Weight			
Height/Length			
Head Circumference			
Chest Circumference			
Mid-arm Circumference			
US:LS			
Arm Span			

iii. Systemic Examination

CVS

RS

PA

CNS:

2. **Investigations:**

Date							
Blood group							
Hb							
RBC							
PCV							
TLC							
Platelets							
N/L/E/M/B							
ReticCount							
Urea							
Creat							
Na							
K							
Cl							

3. Treatment:

4. Final Diagnosis at Discharge:

5. **PRISM SCORE III**

Variables	**Age restrictions and range**		**Expected score**	**Observed score (4-6 hours after admission)**
Systolic BP in mm of Hg	Infants	Children		
	130-160	50-200	2	
	55-65	65-75		
	>160	>200	6	
	40-54	50-64		
	<40	<50	7	
Diastolic BP in mm of Hg	All ages		6	
	>110			
Heart rate in beats per minute	Infants	Children		
	>160	>150	4	
	<90	<80	4	
Respiratory rate in cycles per minute	Infants	Children		
	61-90	51-70	1	
	>90	>70	5	
	Apnoea	Apnoea	5	
PaO2/FiO2	All ages	200-300	2	
		<200	3	
PaCO2 in torr (mm Hg)	All ages	51-65	1	
		>65	5	

GCS	All ages	<8	6	
Pupillary reactions	All ages	Unequal or dilated Fixed or dilated	4 10	
PT/aPTT	All ages	1.5 times control	2	
Total Bilirubin mg/dL	>1 month	>3.5	6	
Potassium in mEq/L	All ages	3.0-3.5 6.5-7.5 <3.0 >7.5	1 1 5 5	
Calcium in mg/dL	All ages	7.0-8.0 12.0-15.0 <7.0 >15.0	2 2 6 6	
Glucose in mg/dL	All ages	40-60 250-400 <40 >400	4 4 8 8	
Bicarbonate in mEq/L	All ages	<16 >32	3 3	
Total Score				

6. PRISM IV SCORE

PARAMETERS	AT ADMISSION (4 hours after admission)
Age (vs ≥ 12 mo) 0 to < 14 d 14 d to < 1 mo 1 to < 12 mo	
Admission source (vs operating room or postanesthesia care unit) Another hospital Inpatient unit Emergency department	
Cardiopulmonary resuscitation within 24 hr before PICU admission	
Cancer (acute or chronic)	
Low-risk systems of primary dysfunction(a)	
Paediatric Risk of Mortality physiologic variable score(b) Neurologic 1. Pupillary Reactivity 2. GCS(15) Non-Neurological 1. HR 2. SBP 3. Temperature 4. ABGA	

(pH|pO2|pCO2|HCO3-) 5. Glucose 6. K+ 7. BUN 8. S.Creatinine 9. WBC count 10. Platelet count 11. PT | aPTT	

(a)Endocrine, haematological, musculoskeletal, and renal systems of primary dysfunction.

(b)For each one point Paediatric Risk of Mortality physiologic variable score increase. Neurologic components include pupillary reactivity and mental status. Nonneurologic components include heart rate, systolic blood pressure, temperature, arterial Po2, pH, Pco2, total bicarbonate, glucose, potassium, blood urea nitrogen, creatinine, WBC count, platelet count, prothrombin, and partial thromboplastin time.

7.Paediatric cerebral performance category (PCPC) Score

Score	Category	Description	At Discharge	At 3-month Follow Up
1	Normal	• Normal- At age-appropriate levels functioning • Pre-school child- Developmentally appropriate. • School-age child- attend regular school classroom.		
2	Mild disability	• Conscious, alert, able to interact at age-appropriate level; • Mild neurological deficit that is controlled and does not interfere with daily functioning • Preschool children- attends regular school, but grades perhaps not age-appropriate, possibility of mild neurologic deficit but more than 75% of all daily living milestones are above the 10^{th} percentile.		
3	Moderate disability	• Below Age-appropriate functioning • Neurological disease that is not controlled and severely limits activities • Most activities of preschool child's daily living developmental milestones are below the 10^{th} percentile • School age child can perform activities of daily living but attends special classes because of cognitive difficulties and/or has learning deficit		
4	Severe disability	• Preschool child's activities or daily living milestones are below 10^{th} percentile and		

		child is excessively dependant on others for provision of activities of daily life • School age child may be so impaired as to be unable to attend school; school-age child is dependent on others for provision of activities of daily living • Abnormal motor movements for both preschool and school age child may include non-purposeful,decorticate or decerebrate responses to pain.		
5	Coma or vegetative state	• Any degree of coma, • Unaware, even if awake in appearance, without interaction with the environment; • Unresponsive with no evidence of cortex function(not aroused by verbal stimuli); • Possibility for some reflexive response, spontaneous eye- opening, sleep-wake cycles		
6	Brain death/death	Brain death, death		
(D)PCPC				

Group	Categories declined	
0	No decline	
1	1 category decline	
2	2-5 category decline	

ANNEXURE III- KEY TO MASTERCHART

AGE	-	Acute Gastroenteritis
ADEM	-	Acute Demyelinating Encephalomyelitis
AGN	-	Acute Glomerulonephritis
AIHA	-	Autoimmune Hemolytic Anemia
AMA	-	Against Medical Advice
BOOP	-	Bronchiolitis Obliterans Organizing Pneumonia
CHD	-	Congenital Heart Disease
CCF	-	Congestive Heart Failure
CVS	-	Cardiovascular System
COVID	-	Corona Virus Disease
CNS	-	Central Nervous System
dPCPC score	-	delta Paediatric Cerebral Performance Category score
DKA	-	Diabetic Ketoacidosis
DORV	-	Double Outlet Right Ventricle
DCM	-	Dilated Cardiomyopathy
DM	-	Diabetes Mellitus
GBS	-	Guillian Barre Syndrome
LRTI	-	Lower Respiratory Tract Infection
MISC	-	Multisystem Inflammatory Syndrome in Children

PRISM III score	-	Paediatric Risk of Mortality III score
PRISM IV score	-	Paediatric Risk of Mortality IV score
PCPC score	-	Paediatric Cerebral Performance Category score
RS	-	Respiratory System
RTA	-	Road Traffic Accident
TBI	-	Traumatic Brain Injury
URTI	-	Upper Respiratory Tract Infection
WALRI	-	Wheeze Associated Lower Respiratory Tract Infection

ANNEXURE IV- MASTERCHART

age	gender	Socio-economic Class	diagnosis at admission	diagnosis at discharge	system involved	Length of Hospital Stay	Length of Ventilation	PRISM III (out of 52)	PRISM IV(out of 25)	PCPC score at discharge	PCPC score at follow up	dPCPC	Outcome on follow up
6mo	Male	IV	Fever under Evaluation	Viral Pneumonia	RS	6	3	27	13	1	1	0	survived; Improved
7mo	Female	IV	Viral Myocarditis	Viral Myocarditis	CVS	6	3	29	15	2	1	0	survived; Improved
6yrs	Female	III	RTA	Severe Traumatic brain injury with mild Neurodeficit and Miller Fischer syndrome	CNS	24	17	46	21	3	2	1	survived; Improved
5mo	Female	IV	Pancytopenia	Severe Megalobalstic Anaemia	Hematology	13	1	22	13	1	1	0	survived; Improved
4yr	Female	V	PDA	Acyanotic Congenital Heart Disease not in CCF with Moderate sized PDA with LRTI	CVS	5	3	27	14	1	1	0	survived; Improved
5yr	Male	IV	CHD (VSD)	Acyanotic Congenital Heart Disease not in CCF with VSD with LRTI	CVS	8	5	27	13	2	1	0	survived; Improved
8mo	Male	IV	Cleft palate	Left side Cleft Palate with LRTI	Congenital Anomaly	7	0	25	14	1	1	0	survived; Improved
6yr	Male	V	RTA	Mild Traumatic Brain Injury with no Neurodeficit	CNS	32	25	31	17	2	1	0	survived; Improved
10yr	Male	IV	Dengue fever	Dengue fever in critical phase	Infectious Disease	11	0	18	15	1	1	0	survived; Improved
8yr	Male	IV	Chronic liver failure	Chronic Liver Failure	GastroIntestinal system	26	0	35	19	2	-------	-----	Excluded from study due to readmission before follow up
17yr	Male	V	Viral Myocarditis	Viral Myocarditis in Cardiogenic Shock with sesvere LV Dysfunction	CVS	25	18	44	21	2	1	1	survived; Improved

age	gender	Socio-economic Class	diagnosis at admission	diagnosis at discharge	system involved	Length of Hospital Stay	Length of Ventilation	PRISM III (out of 52)	PRISM IV(out of 25)	PCPC score at discharge	PCPC score at follow up	dPCPC	Outcome on follow up
8yr	Male	IV	Dengue fever	Dengue fever in critical phase	Infectious Disease	3	0	17	13	1	1	0	survived; Improved
4yr	Male	IV	Convulsion under evaluation	Febrile seizure	CNS	5	0	19	13	2	1	1	survived; Improved
11mo	Male	III	Hypocalcemic seizures	Sudden Onset Juvenile Idiopathic Arthritis	CNS	8	0	17	13	1	1	0	survived; Improved
16yr	Female	III	DKA	Severe Diabetic Ketoacidosis	Endocrine	21	2	32	19	2	1	1	survived; Improved
5yr	Male	IV	GBS	Guillian Barre Syndrome with no Respiratory Failure	CNS	8	3	36	19	2	1	1	survived; Improved
4mo	Female	IV	CHD(TOF with LRTI)	Cyanotic Congenital Heart Disease with Tetralogy of Fallot not in CCF	CVS	6	6	22	16	1	1	0	survived; Improved
8yr	Female	III	CVA	Pediatric Stroke	CNS	9	5	38	18	3	1	2	survived; Improved
7yrs	Male	V	Acute Liver Failure	Acute Liver Failure with Stage 1 Hepatic Encephalopathy	GastroIntestinal system	9	2	35	18	-----	------	----	AMA discharge
14yr	Male	IV	Dengue fever	Dengue fever with warning signs with right sided Plueral effusion	Infectious Disease	7	2	18	15	1	1	0	survived; Improved
15yr	Male	IV	RTA	Mild Traumatic Brain Injury with no Neurodeficit with Left Tibia Fracture	CNS	21	7	29	17	2	1	1	survived; Improved
8mo	Male	IV	Convulsion under evaluation	Hypocalcemic convulsions	CNS	15	0	20	14	1	1	0	survived; Improved
7yr	Male	III	AGN	Acute Glomerulonephritis	Nephrology	15	0	26	16	1	1	0	survived; Improved
5yr	Female	IV	Rickettsial fever	Rickettsial fever	Infectious Disease	5	0	29	17	1	1	0	survived; Improved

age	gender	Socio-economic Class	diagnosis at admission	diagnosis at discharge	system involved	Length of Hospital Stay	Length of Ventilation	PRISM III (out of 52)	PRISM IV(out of 25)	PCPC score at discharge	PCPC score at follow up	dPCPC	Outcome on follow up
10yr	Female	III	Respiratory distress	Wheeze associated Lower respiratory Tract Infection	RS	6	4	25	16	1	1	0	survived; Improved
5yr	Male	IV	RTA	Subdural Hemorrhage with no Neurodeficit	CNS	8	0	33	17	1	1	0	survived; Improved
1.5yr	Male	IV	Febrile seizure	Febrile seizure	CNS	4	0	23	15	1	1	0	survived; Improved
14yr	Female	IV	Seizure disorder	Benign Partial Seizure of Adolescence	CNS	8	1	26	17	2	1	1	survived; Improved
3yr	Male	III	Febrile seizure	Febrile seizure	CNS	4	0	27	16	1	1	0	survived; Improved
17mo	Female	II	BOOP with Type 2 Resp.failure	BOOP with Type 2 Respiratory Failure	RS	59	48	45	22	3	1	2	survived; Improved
3yr	Female	IV	URTI	URTI	RS	8	3	25	15	1	1	0	survived; Improved
12mo	Male	IV	Budd Chiari Syndrome	Budd Chairi Syndrome	HepatoBiliary System	7	0	28	17	1	1	0	survived; Improved
10mo	Male	IV	LRTI	LRTI	RS	5	3	27	15	1	1	0	survived; Improved
12yr	Male	IV	RTA	Subdural Hemorrhage with no Neurodeficit	CNS	5	2	32	18	2	1	1	survived; Improved
9mo	Male	III	Dengue fever	Dengue fever with Warning signs	Infectious Disease	7	0	26	17	1	1	0	survived; Improved
16yr	Male	III	Addison’s disease	Addison's disease	Endocrine	7	0	29	18	1	1	0	survived; Improved
2.5yr	Male	IV	AGE	Acute Gastroenteritis with some Dehydration	GastroIntestinal system	4	0	26	15	1	1	0	survived; Improved
6mo	Female	V	Bronchopneumonia	Bronchopneumonia	RS	5	2	27	17	1	1	0	survived; Improved
2yr	Female	V	Anaemia	Severe Iron Deficiency Anemia not in CCF	Hematology	5	2	25	16	2	1	1	survived; Improved
1.5yr	Female	V	Gaucher’s disease	Gaucher's disease	Hematology	5	0	29	18	1	1	0	survived; Improved
9yr	Male	IV	Head injury	RTA with no Neurodeficit	CNS	6	2	30	17	1	1	0	survived; Improved
7yr	Male	III	Dengue fever	Dengue fever in critical phase	Infectious Disease	5	0	29	16	1	1	0	survived; Improved

age	gender	Socio-economic Class	diagnosis at admission	diagnosis at discharge	system involved	Length of Hospital Stay	Length of Ventilation	PRISM III (out of 52)	PRISM IV(out of 25)	PCPC score at discharge	PCPC score at follow up	dPCPC	Outcome on follow up
9yr	Male	IV	Dengue fever	Dengue fever in critical phase	Infectious Disease	4	0	28	16	1	1	0	survived; Improved
14yr	Male	IV	Dengue fever	Dengue fever in critical phase	Infectious Disease	6	0	35	18	1	1	0	survived; Improved
9yr	Male	IV	Dengue fever with myocarditis	Dengue fever with myocarditis	Infectious Disease	8	4	34	20	1	1	0	survived; Improved
15yr	Female	IV	Febrile seizure	Febrile seizure	CNS	3	0	28	18	1	1	0	survived; Improved
17yr	Male	V	Snake bite	Snake bite	POISONING	6	0	29	14	1	1	0	survived; Improved
1yr	Male	III	Febrile seizure	Febrile seizure	CNS	3	0	29	17	2	----	----	failed to follow up
5mo	Male	IV	AGE	AGE with severe dehydration	GastroIntestinal system	10	0	28	19	1	1	0	survived; Improved
7yr	Female	II	GBS	GBS	CNS	16	6	28	17	2	1	1	survived; Improved
5yr	Male	IV	Anaemia	Iron deficiency Anaemia in CCF	Hematology	3	1	34	16	1	1	0	survived; Improved
1mo	Female	IV	Convulsion under evaluation	Hypocalcemic convulsions	CNS	3	0	29	14	1	1	0	survived; Improved
4mo	Female	IV	VSD with LRTI	Acyanotic Congenital Heart Disease not in CCF with VSD with LRTI	CVS	10	4	29	15	2	2	0	survived; Improved
4yr	Male	IV	Dengue fever	Dengue fever with Warning signs	Infectious Disease	4	0	34	19	1	1	0	survived; Improved
1yr	Female	III	Fever under Evaluation	Viral Pneumonia with Iron deficiency Anaemia	RS, Hematology	9	3	33	18	2	1	1	survived; Improved
9yr	Female	IV	Anaemia	Severe Megaloblastic Anaemia	Hematology	5	0	26	15	1	1	0	survived; Improved
9yr	Female	III	AGN	AGN	Nephrology	7	0	29	19	1	1	0	survived; Improved
7mo	Male	IV	Dengue fever	Dengue fever in critical phase	Infectious Disease	13	0	33	18	1	1	0	survived; Improved

age	gender	Socio-economic Class	diagnosis at admission	diagnosis at discharge	system involved	Length of Hospital Stay	Length of Ventilation	PRISM III (out of 52)	PRISM IV(out of 25)	PCPC score at discharge	PCPC score at follow up	dPCPC	Outcome on follow up
4yr	Male	V	Op/c/o appendicectomy	Op/c/o appendicectomy	post-operative care	2	0	30	17	1	1	0	survived; Improved
4yr	Female	IV	Dengue fever	Dengue fever in critical phase	Infectious Disease	4	0	30	17	1	1	0	survived; Improved
15yr	Female	IV	Anaemia	Severe Iron Deficiency Anaemia with megaloblastic anaemia	Hematology	4	2	25	15	2	1	1	survived; Improved
9mo	Female	IV	Febrile seizure	Febrile seizure	CNS	6	0	25	15	1	1	0	survived; Improved
14yr	Female	IV	MISC-DKA	MISC-DKA	COVID-19	2	2	45	29	----	----	----	AMA discharge
3mo	Female	IV	Anaemia	Severe Iron Deficiency Anaemia	Hematology	7	2	29	15	2	1	1	survived; Improved
9mo	Female	III	LRTI	LRTI	RS	3	1	28	17	1	1	0	survived; Improved
9mo	Female	II	Congenital Heart Disease	Left Hypoplastic Heart Syndrome	CVS	15	15	37	20	----	-------	-----	Death
13yr	Male	III	Convulsion disorder	Benign Partial Seizure of Adolescence	CNS	7	1	30	17	2	1	1	survived; Improved
16yr	Female	IV	Dengue fever	Dengue fever with warning signs	Infectious Disease	4	0	29	16	1	1	0	survived; Improved
8mo	Male	IV	Sev. Anaemia	Severe Iron Deficiency Anemia not in CCF	Hematology	5	0	28	16	1	1	0	survived; Improved
6yr	Male	IV	Dengue fever	Dengue fever in critical phase	Infectious Disease	7	0	35	18	1	1	0	survived; Improved
14yr	Female	IV	?ADEM	Acute Demyelinating encephalomyelitis	CNS	4	0	34	20	2	1	1	survived; Improved
10yr	Female	IV	Dengue fever	Dengue fever in critical phase	Infectious Disease	5	0	28	18	1	1	0	survived; Improved
12yr	Female	V	Anaemia	Severe Iron Deficiency Anemia not in CCF	Hematology	5	0	29	14	2	1	1	survived; Improved
1mo	Female	V	Pnuemonia	Right Lobar Pnuemonia	RS	5	2	29	17	1	1	0	survived; Improved

age	gender	Socio-economic Class	diagnosis at admission	diagnosis at discharge	system involved	Length of Hospital Stay	Length of Ventilation	PRISM III (out of 52)	PRISM IV(out of 25)	PCPC score at discharge	PCPC score at follow up	dPCPC	Outcome on follow up
5yr	Female	IV	Pancytopenia	Severe Megaloblastic Anaemia	Hematology	5	0	28	19	1	1	0	survived; Improved
10yr	Female	IV	Dengue fever	Dengue fever in critical phase	Infectious Disease	6	0	28	17	1	1	0	survived; Improved
10yr	Female	III	Urticaria	Urticaria	Immunology	5	0	34	16	1	1	0	survived; Improved
10yr	Male	IV	Dengue fever	Dengue fever in critical phase	Infectious Disease	5	0	29	14	1	1	0	survived; Improved
7mo	Female	IV	Megaloblastic anaemia	Megaloblastic anaemia	Hematology	7	0	29	15	1	1	0	survived; Improved
6mo	Female	V	DORV with VSD	DORV with VSD	CVS	13	8	34	19	1	1	0	survived; Improved
2yr	Female	III	DCM	Dilated Cardiomyopathy	CVS	10	7	33	18	1	1	0	survived; Improved
9yr	Male	IV	Dengue fever	Dengue fever with warning signs	Infectious Disease	4	0	26	15	1	1	0	survived; Improved
12yr	Female	IV	Autoimmune encephalitis	Autoimmune encephalitis	CNS	7	0	29	19	2	2	0	survived; Improved
1.5yr	Male	V	RTA	Subdural Hemorrhage with no Neurodeficit	CNS	5	0	33	18	2	1	1	survived; Improved
3mo	Male	V	Hypocalcemic seizures	Hypocalcemic seizures	CNS	5	0	30	17	1	1	0	survived; Improved
14yr	Male	III	Viral Pneumonia	Viral Pneumonia	RS	5	2	30	17	1	1	0	survived; Improved
14yr	Female	IV	MISC-Myocarditis	MISC-Myocarditis	COVID-19	10	3	25	15	1	1	0	survived; Improved
16yr	Female	IV	Dengue fever	Dengue fever in critical phase	Infectious Disease	5	0	25	15	1	1	0	survived; Improved
8yr	Female	IV	Dengue fever	Dengue fever with warning signs with left side Plueral Effusion	Infectious Disease	9	3	29	18	1	1	0	survived; Improved
9yr	Female	IV	Dengue shock syndome	Dengue shock syndome	Infectious Disease	7	0	31	19	1	1	0	survived; Improved
3mo	Male	IV	Bronchopneumonia	Bronchopneumonia	RS	6	3	25	15	1	1	0	survived; Improved
11yr	Female	III	Dengue Hepatitis, MISC-Myocarditis	Dengue Hepatitis. Dengue Nephritis, MISC-Myocarditis	COVID-19	19	5	37	19	2	----	-----	Excluded from study due to readmission before follow up
7mo	Female	IV	Bronchiolitis	Bronchiolitis	RS	5	3	26	14	1	1	0	survived; Improved

age	gender	Socio-economic Class	diagnosis at admission	diagnosis at discharge	system involved	Length of Hospital Stay	Length of Ventilation	PRISM III (out of 52)	PRISM IV(out of 25)	PCPC score at discharge	PCPC score at follow up	dPCPC	Outcome on follow up
7mo	Male	IV	Dengue fever	Dengue fever in critical phase	Infectious Disease	6	0	28	15	1	1	0	survived; Improved
3yr	Female	IV	Dengue fever	Dengue fever with warning signs	Infectious Disease	6	0	25	15	1	1	0	survived; Improved
2yr 3mo	Male	IV	LRTI	LRTI	RS	6	3	28	16	1	1	0	survived; Improved
2yrs	Female	IV	Bronchopneumonia	Bronchopneumonia	RS	10	4	27	14	1	1	0	survived; Improved
4mo	Female	IV	LRTI	LRTI	RS	11	4	27	15	1	1	0	survived; Improved
4mo	Female	V	LRTI	LRTI	RS	6	3	27	15	1	1	0	survived; Improved
1yr	Male	IV	Bronchiolitis	Bronchiolitis	RS	5	3	25	13	1	1	0	survived; Improved
10yrs	Female	IV	AIHA	AIHA	Hematology	7	0	23	13	1	1	0	survived; Improved
8mo	Female	IV	Bronchopneumonia	Bronchopneumonia	RS	11	4	26	15	1	1	0	survived; Improved
5yrs	Male	IV	Dengue fever	Dengue fever	Infectious Disease	4	0	26	16	1	1	0	survived; Improved
10yrs	Female	III	Type 1 DM	Type 1 DM with Diabetic Ketoacidosis	Endocrine	11	2	34	17	2	1	1	survived; Improved
5yrs	Male	III	Dengue fever	Dengue fever in critical phase	Infectious Disease	7	0	26	15	1	1	0	survived; Improved
3yrs	Female	IV	LRTI	LRTI	RS	6	4	28	17	1	1	0	survived; Improved
4yrs	Male	V	Bronchiolitis	Bronchiolitis	RS	6	4	27	17	1	1	0	survived; Improved
10mo	Male	V	Bronchopneumonia	Bronchopneumonia	RS	13	5	29	18	1	1	0	survived; Improved
4yrs	Male	IV	LRTI	LRTI	RS	5	2	28	17	1	1	0	survived; Improved
3mo	Female	IV	AGE	AGE with some dehydration	GastroIntestinal system	4	0	25	16	1	1	0	survived; Improved
11mo	Female	IV	LRTI	LRTI	RS	10	5	27	17	1	1	0	survived; Improved
6mo	Female	IV	Bronchiolitis	Bronchiolitis	RS	5	3	26	16	1	1	0	survived; Improved
45days	Male	V	LRTI	LRTI	RS	6	3	28	17	1	1	0	survived; Improved
14yrs	Male	IV	Bacterial Meningitis	Bacterial Meningitis	CNS	16	3	32	19	2	1	1	survived; Improved
4yrs	Male	IV	Dengue fever	Dengue fever in critical phase	Infectious Disease	8	0	26	14	1	1	0	survived; Improved

age	gender	Socio-economic Class	diagnosis at admission	diagnosis at discharge	system involved	Length of Hospital Stay	Length of Ventilation	PRISM III (out of 52)	PRISM IV(out of 25)	PCPC score at discharge	PCPC score at follow up	dPCPC	Outcome on follow up
5yrs	Male	IV	Dengue fever	Dengue fever in critical phase	Infectious Disease	6	0	26	14	1	1	0	survived; Improved
2yrs	Male	IV	Rickettsial fever	Rickettsial fever	Infectious Disease	3	0	28	16	1	1	0	survived; Improved
14yrs	Male	V	Dengue fever	Dengue fever in critical phase	Infectious Disease	3	0	27	17	1	1	0	survived; Improved
13yrs	Male	III	Dengue fever with warning signs	Dengue fever with warning signs	Infectious Disease	4	0	26	16	1	1	0	survived; Improved
13yrs	Female	IV	Dengue fever	Dengue fever in critical phase	Infectious Disease	5	0	27	17	1	1	0	survived; Improved
4yrs	Male	IV	Dengue fever with warning signs	Dengue fever with warning signs	Infectious Disease	3	0	28	17	1	1	0	survived; Improved
8yrs	Female	IV	Dengue fever	Dengue fever in critical phase	Infectious Disease	4	0	27	17	1	1	0	survived; Improved
2yrs	Male	IV	Febrile seizure	Febrile seizure	CNS	3	0	25	14	1	1	0	survived; Improved
5mo	Female	IV	Acute GE with severe dehydration	Acute GE with severe dehydration	GastroIntestinal system	4	0	24	14	1	1	0	survived; Improved
3yrs	Male	IV	Febrile seizure	Febrile seizure	CNS	5	0	26	14	2	1	1	survived; Improved
11yrs	Male	IV	Dengue fever with warning signs	Dengue fever with warning signs	Infectious Disease	4	0	26	16	1	1	0	survived; Improved
10mo	Male	V	LRTI	LRTI	RS	3	1	27	18	2	1	1	survived; Improved
3yrs	Female	III	Viral Pneumonia with secondary bacterial infection	Viral Pneumonia with secondary bacterial infection	RS	6	4	29	17	1	1	0	survived; Improved
14yrs	Male	III	Benign Partial Seizure of Adolescence	Benign Partial Seizure of Adolescence	CNS	4	0	31	19	2	1	1	survived; Improved
1.5yrs	male	IV	Simple febrile seizure with LRTI	Simple febrile seizure with LRTI	CNS	2	0	28	17	2	1	1	survived; Improved
10yrs	female	IV	AGE with some dehydration	AGE with some dehydration	GastroIntestinal system	4	0	25	15	1	1	0	survived; Improved

age	gender	Socio-economic Class	diagnosis at admission	diagnosis at discharge	system involved	Length of Hospital Stay	Length of Ventilation	PRISM III (out of 52)	PRISM IV(out of 25)	PCPC score at discharge	PCPC score at follow up	dPCPC	Outcome on follow up
16yrs	Male	III	LRTI	LRTI	RS	3	1	27	17	1	1	0	survived; Improved
2yrs	Male	IV	Febrile seizure	Febrile seizure	CNS	5	0	25	14	2	1	1	survived; Improved
6yrs	Female	IV	LRTI	LRTI	RS	6	4	27	17	1	1	0	survived; Improved
13yrs	Male	IV	Dengue fever	Dengue fever	Infectious Disease	7	0	27	18	1	1	0	survived; Improved
11yrs	Male	V	Acute Gastroenteritis	Acute Gastroenteritis	GastroIntestinal system	5	0	25	14	1	1	0	survived; Improved
14yrs	Female	V	LRTI	LRTI	RS	3	1	26	16	1	1	0	survived; Improved
5mo	Male	IV	Acute Gastroenteritis	Acute Gastroenteritis	GastroIntestinal system	3	0	25	14	1	1	0	survived; Improved
6yrs	Female	III	RTA	RTA with no Neurodeficit	CNS	4	0	31	19	2	1	1	survived; Improved
8mo	Female	III	LRTI	LRTI	RS	7	4	26	15	1	1	0	survived; Improved
6mo	Female	IV	LRTI	LRTI	RS	3	1	26	16	1	1	0	survived; Improved
3.5yrs	Male	III	WALRI	WALRI	RS	3	1	27	17	1	1	0	survived; Improved
13yrs/Male	Male	IV	Dengue fever	Dengue fever in critical phase	Infectious Disease	7	0	27	17	1	1	0	survived; Improved
5yrs/Male	Male	IV	Dengue fever	Dengue fever with warning signs	Infectious Disease	6	0	27	17	1	1	0	survived; Improved
15mo	Male	IV	Bronchopneumonia	Bronchopneumonia	RS	5	3	25	16	1	1	0	survived; Improved
5yrs/Male	Male	IV	Acute Gastroenteritis	Acute Gastroenteritis with some Dehydration	GastroIntestinal system	4	0	25	14	1	1	0	survived; Improved
6mo	Male	V	LRTI	LRTI	RS	9	5	26	15	1	1	0	survived; Improved
35days	Male	V	URTI	URTI	RS	2	0	25	14	1	1	0	survived; Improved