The Association of **RT-PCR Cycle Threshold Value** with **Timing of Sample Collection and Presenting Manifestations of COVID-19** among Pediatric Patients admitted in a Tertiary Hospital in Davao City

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BACKGROUND

- Ct value has gained clinical attention in the study of COVID-19 as it has used as an indirect method of quantifying the viral RNA in a specimen
- Investigating its utility will aid in discovering transmission dynamics and clinical decision-making

Objective:

To determine the association between the RT-PCR Ct value with the timing of sample collection and presenting manifestations of COVID-19 among pediatric patients admitted at a tertiary hospital in Davao City.

METHODOLOGY

Study Design:	Retrospective, cross-sectional
Study Setting:	Private tertiary hospital
Inclusion Criteria:	All pediatric patients with a (+)SARS-CoV-2 RT-PCR done in the study setting, with a Ct value of ≤40
Exclusion Criteria:	Children with comorbidities
Sampling Design:	Purposive sampling
Sample Size:	Minimum computed sample size is 45

METHODOLOGY

Data Gathering

Research approval

- Chart review
- Ct value retrieval from Molecular laboratory

48 out of 91 satisfied the criteria

Data analysis

- ✓ Descriptive statistics
- ✓ Independent t-test
- ✓ ANOVA
- ✓ Pearson r

RESULTS

Cycle Threshold Value and Timing of Sample Collection Among Pediatric Patients with Confirmed COVID-19

Day of illness/collection	Ct Value	p-value
Day 1	26.1 ± 4.07	
Day 2	24.29 ± 5.67	
Day 3	22.42 ± 4.98	0.039
Day 4	31.86 ± 6.78	
Day 5	33.7 ± 7.45	
Day 6 or more	29.93 ± 7.87	

Significant p-value <0.05

✓ ***The mean Ct values showed a downward trend on the first three days of illness.***

RESULTS

Correlation Between Cycle Threshold Value and Timing of Sample Collection Among Pediatric Patients with Confirmed COVID-19

Correlation	Pearson r	p-value
Timing of Sample Collection and Ct Values	0.3027	0.0112

Significant p-value <0.05

Interval coefficient	Relationship level
± 0.80 – 1.000	Very strong positive/negative correlation
± 0.60 – 0.799	Strong positive/negative correlation
± 0.40 – 0.599	Moderate positive/negative correlation
± 0.20 – 0.399	Weak positive/negative correlation
± 0.00 – 0.199	Very weak positive/negative correlation

- ✓ ***There is a significant difference in the Ct values in relation to timing of sample collection.***
- ✓ ***Timing of sample collection is positively correlated with Ct value.***

RESULTS

Cycle Threshold Value and Presenting Manifestations of Pediatric Patients with Confirmed COVID-19

Type of Manifestations	Ct Value	p-value
Respiratory manifestations	25.13 ± 7.93	0.761
Gastrointestinal manifestations	28.91 ± 9.08	
Non-respiratory and non-gastrointestinal manifestations	27.94 ± 9.12	

Significant p-value <0.05

- ✓ ***Subjects with respiratory symptoms had the lowest mean Ct value.***
- ✓ ***There was no significant difference in the Ct values among the different presenting manifestations.***

RESULTS

Correlation between Cycle Threshold Value and Number of Presenting Manifestations among Pediatric Patients with Confirmed COVID-19

Number of Presenting Manifestations	Ct Values	Pearson r	p-value
1	27.7 ± 3.4	-0.2045	0.012
2	27.14 ± 2.98		
3	29.49 ± 2.43		
4	28.55 ± 2.1		
5 and more	22.6 ± 1.3		

✓ *There is an inverse correlation between the number of presenting manifestations and Ct values.*

CONCLUSIONS

- *Ct value is positively correlated with the timing of sample collection (p value 0.039) and is significantly low during the first three days of illness.*
- *There is no significant difference in the mean Ct values of the different presenting manifestations.*
- *There is an inverse correlation between the number of presenting manifestations and Ct value.*

RECOMMENDATIONS

- Ct values must always be *correlated with the patient's exposure history and symptoms*
- *Isolation and early testing for SARS-CoV-2 during the first three days of illness is recommended*
- Conduction of *larger, multi-site, prospective studies*