Vol 10 No 2, 2025

BULETIN FARMATERA

E-ISSN: 2528-410X

RESEARCH ARTICLE

The Relationship Between CT Value and Clinical Degree of Children With Covid-19 in RSU Bunda Thamrin Medan

Ifany Hafidzah Siregar[1], Eka Airlangga[2]

[1] Faculty of Medicine, *Universitas Muhammadiyah Sumatera Utara, Jalan Gedung Arca Nomor 53*, Medan, North Sumatera, 20127, Indonesia

[2] Department of Pediatric, Faculty of Medicine, *Universitas Muhammadiyah Sumatera Utara, Jalan Gedung Arca Nomor 53*, Medan, North Sumatera, 20127, Indonesia

Corresponding Email : Ifanyhafidzah2001@gmail.com[1]
Ekaairlangga@umsu.ac.id[2]

Abtract : Coronavirus disease 2019 (COVID-19) is caused by Coronavirus 2 acute respiratory syndrome (SARS-CoV-2). COVID-19 has varied clinical manifestations, ranging from asymptomatic, mild, moderate, severe and critical. Diagnosis in COVID-19 patients can be established using RT-PCR. This study aims to determine the relationship between CT value and clinical degree of children with covid-19 in RSU Bunda Thamrin Medan.This type of research is an analytical observational study with a cross-sectional study. The number of samples in this study was 165 samples. Of the 165 pediatric patients diagnosed with COVID-19, 53 children (32.12%) were aged < 5 years while 112 children (67.88%) were aged ≥ 5 years. Males were 97 children (58.79%) and girls were 68 (41.21%). The most common comorbid disease was obesity, which was 51 children (67.1%). Pediatric patients with asymptomatic symptoms 8 children (4.8%), 126 children (76.4%) with mild symptoms, 7 children (4.2%) with moderate symptoms, 23 children (13.9%) with severe symptoms and 1 child (0.6%) with critical symptoms. 143 children (86.67%) patients had CT Value values ≤ 29, 21 children (12.73%) patients with CT Value values of 30 – 37, and 1 child (0.6%) had CT Value values of 38 – 40. In this study, it was found that there was a relationship between CT Value and the clinical degree of children with COVID-19.

Keywords: COVID-19, Child, CT Value, Degree of severity

INTRODUCTION

Coronavirus Disease *2019* (COVID-19) is caused by *Coronavirus 2* acute respiratory syndrome (SARS-CoV-2), COVID-19 is a disease that poses a health threat worldwide. *Coronavirus* 2019 (COVID-19) was first discovered in Wuhan City, Hubei Province, China, on December 12, 2019. On February 11, 2020, the *World Health Organization* (WHO) officially announced that the current CoV-related disease has become COVID-19 and has been declared a global pandemic.[1] Based on age, the percentage of children infected with

E-ISSN: 2528-410X

COVID-19 is as large as cases in adults. The first case of COVID-19 in a child was reported on January 20, 2020, a 10-year-old boy from Shenzhen, China.[2] Based on data from the Indonesian Ministry of Health in 2021, as many as 24,438 cases occurred in the age group of 0-5 years, 80,555 cases in the age group of 6-18 years.[4] The symptoms are very similar to acute respiratory viral infections in general, even most infected children do not show symptoms.[3] There are several levels of severity based on the clinical symptoms that can be experienced by children infected with COVID-19, in asymptomatic patients there are no signs and symptoms of any kind. Patients with mild symptoms can be fever, cough, *myalgia*, and fatigue. In patients with moderate symptoms, it can be accompanied by *pneumonia* and abnormal imaging. Meanwhile, in patients with severe symptoms, dyspnea, hypoxia, and central cyanosis can be found. Terdapat pula gejala pada pasien kritis berupa *Acute Respiratory Distress Syndrome* (ARDS), respiratory failure, shock, and *multi-organ dysfunction*.[5] Common symptoms in children include upper respiratory tract symptoms (26-54%), cough (44-54%), fever (32-65%), and gastrointestinal symptoms (15-30%). In the previous study, data was obtained, of 2597 COVID-19 cases in children, 198 (7.6%) were asymptomatic cases, 1,181 (45.5%) were mild cases, 1,079 (41.5%) were moderate cases, 113 (4.4%) were severe cases, 23 (0.9%) were critical cases, and 3 (0.1%) died.[14] In 29 review studies with 4300 children, 19% showed no symptoms, 37% had no radiographic abnormalities.[15]

Polymerase Chain Reaction (PCR) is a method of propagating DNA *templates* using *the enzyme Taq Polymerase* in *vitro.* There are several components of the PCR reaction consisting of, *Taq Polymerase,* MgCL2, dNTP's (*deoxynucleotide trihospates*), *Buffer, Primers, Templates.* PCR can only be used to multiply the target DNA and cannot amplify RNA, so an additional stage is also needed to be used before the PCR process, namely using RT-PCR (*Reserve Transcription Polymerase Chain Reaction).* In the RT-PCR process, the material genetic RNA will be converted into cDNA which will then be amplified in the PCR process. RT-PCR techniques are useful for detecting specific RNAs such as disease diagnosis, as well as mRNA detection in gene expression studies. RT-PCR technique is used to detect RNA from the SARS-CoV-2 virus.[9] RT-PCR is the most common laboratory test to detect SARS-CoV2 nucleic acids.[20] Real-Time PCR is used to diagnose COVID-19 by providing an overview of the Ct or *Cycle Treshold value* , which is the measure of viral load in the sample. A low Ct value indicates a high viral load and vice versa. From several previous studies, the average Ct value of asymptomatic patients was 39, significantly higher than the average Ct value of asymptomatic patients during the incubation period.[24]

The patient is tested positive for SARS-CoV2 virus if the RT-PCR test results in a CT value below the threshold value. Based on CDC data, patients are considered positive for SARS-CoV2

BULETIN FARMATERA
E-ISSN: 2528-410X

infection if the CT value is <40.[29] The CT value will be inversely proportional to the number of nucleic acid targets in the sample, which means that the lower the CT value, the more nucleic acid is detected.[6,30] Specimens for examination can be taken from the upper airway, namely by swabbing the nasopharynx and oropharynx, then can be taken through a nasopharyngeal rinse or *nasopharyngeal aspirate.* Specimens can also be taken from the lower airway namely sputum, *Endotracheal aspirate, Broncoalveolar lavage, Tracheal aspirate,* lung fluid, and lung biopsy. According to the Indonesian Ministry of Health, specimen collection for suspects is carried out on the 1st and 2nd days with an interval of less than 24 hours and if it worsens and has close contact, immediately conduct an RT-PCR examination since the case is declared as *a probable* or confirmed case.[9] According to previous research, any increase in CT value of 3.3 would be equivalent to a 10-fold decrease in the amount of nucleic acids.[31] In the early period of infection, generally patients have a CT value of 20-30 or even less. In the next phase, the CT value will gradually increase, indicating that the amount of nucleic acids from the virus is getting less. [6]

Based on previous research, data was obtained that the average CT value in asymptomatic patients was 39, which is significantly higher than the average CT value in asymptomatic patients during the incubation period. Several things can affect CT values, such as varying specimens, sampling methods and sampling times.[32]

This study aims to determine the relationship between CT value and clinical degree of children with covid-19 in RSU Bunda Thamrin Medan.

METHOD

This type of research is an analytical observational research with the *Cross Sectional Study* method. This study aims to determine the relationship between CT Value and clinical degree in children with COVID-19 at Bunda Thamrin Hospital Medan from April 2019 to May 2020.

The population of this study is children aged 1 month – 18 years who were diagnosed with COVID-19 at RSU Bunda Thamrin Medan. The study sample was a child aged 1 month- 18 years who was confirmed to be infected with COVID-19 at Bunda Thamrin Hospital Medan from October 2020 to March 2021 in accordance with the inclusion and exculpation criteria.

The inclusion criteria in this study are pediatric patients aged 1 month – 18 years where the child has been diagnosed with COVID-19 and is treated at Bunda Thamrin Hospital Medan, and pediatric patients aged 1 month – 18 years who are confirmed to have COVID-19 with PCR Swab examination. The exclusion criteria in this study were patients under 1 month and over 18 years old and had comorbidities that aggravated the patient's condition, and pediatric patients aged 1 month – 18 years with incomplete medical records. Large sampling using *the Slovin formula.*

Samples were obtained by taking medical record data that met the inclusion criteria in children suffering from COVID-

E-ISSN: 2528-410X

19 at Bunda Thamrin Medan Hospital. The data collection technique used secondary data obtained from the medical records of the first day of the child entering Bunda Thamrin Hospital Medan from April 2019 to May 2020, then recorded and collected as well as analyzed data on the CT Value value and clinical degree of pediatric patients with COVID-19 at Bunda Thamrin Hospital Medan. Data processing is carried out by editing, namely the researcher re-examines the data that has been collected consisting of names and completeness of identity and data obtained from medical records, coding, i.e. the researcher gives certain codes or numbers to the data that has been collected to facilitate tabulation and analysis, entry, i.e. the researcher enters the data into a computer program, Talbulation, namely tabulation, is the process of grouping data in the form of a frequency distribution table, cleaning, which is the researcher conducting a re-examination to avoid errors in the research and analyzing, which is analyzing data that has been processed into a statistical program

The data obtained were statistically analyzed using univariate and bivariate data analysis. Univariate analysis is performed to describe variables in the form of frequencies and percentages and presented in the form of tables. While bivariate analysis is data analysis conducted to find relationships between independent and dependent variables. The statistical test used is the Chi square test.

RESULT

This research was carried out at Bunda Thamrin Hospital Medan. The data used in this study is based on patient medical record data in accordance with the needs of the research. Berdasarkan data medis rumah sakit Bunda Thamrin Medan maka sampel yang digunakan sebanyak 165 orang anak yang di diagnosa COVID-19.

Table 1. Demographic Data of Pediatric Patients with COVID-19 by Age at Bunda Thamrin Hospital Medan

Age	N	%
< 5 y.o	53	32,12
≥ 5 y.o	112	67,88
Total	**165**	**100%**

Based on the table above, it shows that pediatric patients diagnosed with COVID-19 consist of 53 children (32.12%) aged < 5 years while as many as 112 children (67.88%) aged ≥ 5 years, it can be explained that patients are dominated by ≥ 5 years old.

Table 2. Demographic Data of Pediatric Patients with COVID-19 by Gender at Bunda Thamrin Hospital Medan

Gender	N	%
Man	97	58,79
Woman	68	41,21
Total	**165**	**100%**

Based on the table above, it shows that the gender of pediatric patients diagnosed with COVID-19 consists of 97 children (58.79%), while female patients are 68 children (41.21%).

BULETIN FARMATERA
E-ISSN: 2528-410X

Table 3. Data on the Clinical Degree of Pediatric Patients with COVID-19 at Bunda Thamrin Hospital Medan

Clinical Degree	N	%
Asymptomatic	8	4,8
Mild	126	76,4
Moderate	7	4,2
Savere	23	13,9
Critical	1	0,6
Total	**165**	**100%**

Based on the table above, it shows that of the 165 pediatric patients diagnosed with COVID-19, 8 children (4.8%) are asymptomatic, 126 children (76.4%) have mild symptoms, 7 children (4.2%) have moderate symptoms, 23 children (13.9%) have severe symptoms and 1 child (0.6%) with critical symptoms. It can be concluded that pediatric patients are dominated by mild symptoms.

Table 4. Output of Child Patients with COVID-19 at Bunda Thamrin Hospital Medan

Output	N	%
Self-isolation	160	97,0
Return Topic	4	2,4
Die	1	0,6
Total	**165**	**100%**

Based on the table above, it shows that out of 165 pediatric patients diagnosed with COVID-19, 160 children (97%) were allowed to go home with an isolation record, as many as 4 children (2.4%) patients were forced to go home while 1 child (0.6%) died. These results show that from the overall patient data, patients with isolation output are dominated.

Table 5. CT Value of Child Patients with COVID-19 at Bunda Thamrin Hospital Medan

CT Value	N	%
≤ 29	143	86,67
30 – 37	21	12,73
38 – 40	1	0,60
Total	**165**	**100%**

Based on the table above, it shows that out of 165 pediatric patients diagnosed with COVID-19, 143 children (86.67%) have a CT Value of ≤ 29, as many as 21 children (12.73%) patients have a CT Value of 30 – 37 while 1 child (0.6%) has a CT Value of 38 - 40. These results show that from the overall patient data, patients with a CT Value of ≤ 29 are dominated.

Tabel 6. Relation Between CT Value and Clinical Degree of Children With Covid-19 in RSU Bunda Thamrin Medan

		Clinical Degree						
		Asymptomatic	Mild	Moderate	Savere	Criical	Total	p.value
CT value	<29	8 (4,84%)	108 (65,45%)	4 (2,4%)	23 (13,9%)	0 (0%)	143 (86,7%)	0,000

E-ISSN: 2528-410X

30 - 37	0 (0%)	18 (10,91%)	2 (1,2%)	0 (0%)	1 (0,6%)	21 (12,7%)
38 - 40	0 (0%)	0 (0%)	1 (0,6%)	1 (0,6%)	0 (0%)	1 (0,6%)
Total	8 (4,84%)	126 (76,4%)	7 (4,2%)	23 (13,9%)	1 (0,6%)	165 (100%)

The table above shows the clinical degree of pediatric patients with a diagnosis of COVID-19 based on the CT Value interval at Bunda Thamrin Hospital Medan out of a total of 165 children, it can be seen that in the CT Value value of < 29 there were 8 children (4.84%) without symptoms, 108 children (65.45%) with mild clinical degrees, 4 children (2.4%) with moderate clinical degrees, 23 children (13.9%) with severe clinical degrees and 0 children (0%) with critical clinical degrees. In the CT Value of 30 – 37, it can be seen that there are 0 children (0%) without symptoms, 18 children (10.91%) with mild clinical degrees, 2 children (1.2%) with moderate clinical degrees, 0 children (0%) with severe clinical degrees and 1 child (0.6%) with critical clinical degrees. At the CT Value of 38 – 40, it can be seen that there are 0 children (0%) without symptoms, 1 child (0.6%) with mild clinical degree, 2 children (1.2%) with moderate clinical degree, 0 children (0%) with severe clinical degree and 0 children (0%) with critical clinical degree. The table above shows the results that the significance value of <5. If the significance value on Chi Square is <0.05, then the CT Value has a significant relationship with the Clinical Degree of Pediatric Patients diagnosed with COVID-19.

DISCUSSION

Based on demographic analysis conducted on pediatric patients diagnosed with COVID-19, it was found that as many as 165 child data were studied that as many as 53 children (32.12%) were < 5 years old with the disease and 112 children (67.88%) were ≥ 5 years old. This study is in line with previous research conducted by *Sankar et al.,* in this study information was obtained that as many as 17.9% of children infected with COVID-19 were < 5 years old, while the remaining 82.1% of children infected with COVID-19 were > 5 years old.[33] Children who are > 5 years old are more susceptible to being infected with COVID-19 because at that age the child is in the school stage, carrying out various activities and doing many kinds of social interactions that allow more COVID-19 infections to occur.[34]

Based on the univariate analysis carried out, it was found that as many as 97 children

E-ISSN: 2528-410X

(58.79%) were male and 68 children (41.21%) were female, this author explained that male children were more dominant with a dominant age under 5 years. This is in line with a study conducted by *Bai et al,* which explained information that COVID-19 infections in China are dominated by boys with a percentage of 56%, while in girls by 44%.[35] Based on research conducted by *George M.* It is said that male sex is a risk factor for COVID-19 infection, this is linked to various factors such as the higher expression of *angiotensin-converting enzyme-2* (ACE 2) receptors for the coronavirus in men than in women.[36] Another thing that is linked is in the form of immunological differences based on sex hormones driven by sex hormones and the x chromosome, where blocking estrogen receptors in women can block exposure to the COVID-19 virus.[36]

The results of the study were found to have several symptoms as recorded in the medical record data where the results showed that of the 165 pediatric patients diagnosed with COVID-19, the patients were predominantly with mild symptoms, namely 126 children (76.4%) followed sequentially with severe symptoms, moderate symptoms, no symptoms and critical symptoms each 23 children (13.9%), 8 children (4.8%), 7 children (4.2%) and 1 child (0.6%). These results are in line with the research that has been conducted previously by *Cui et al,* in this study conducted in 2020 it was explained that there were 198 (7.6%), 1,181 (45.5%) experienced mild symptoms, 1,079 (41.5%) experienced moderate symptoms, 113 (4.4%) experienced severe symptoms, and 23 (0.9%) experienced critical symptoms.[37]

The results of the study showed that the length of patient care varied with a minimum range of 1 day to a maximum of 30 days. The percentage of treatment duration was 112 children (67.9%) patients were hospitalized for less than 10 days, 40 children (24.2%) patients were treated for a period of 10 to 15 days and as many as 13 children (7.9%) patients were treated for a period of more than 15 days. The results found an average of 9 days. This is in line with research conducted by *Philip Z*, that the average duration of hospitalization in pediatric patients with COVID-19 is close to one week.[38]

In this study, the most common comorbid disease found was obesity, as many as 51 pediatric patients with COVID-19 had obesity comorbid disease. This is also explained in a study conducted by *Edan et al.,* in pediatric patients with COVID-19 as many as 26.8% have obesity comorbid disease.[39] In patients with obesity, adipose tissue is pro-inflammatory which is characterized by increased expression of cytokines, especially adipokin. Obesity will impair the adaptive immune response to the COVID-19 virus, making patients with obesity more susceptible to COVID-19 infection.[40]

In this study, it can be seen that the CT Value of < 29 is most obtained in patients with mild symptoms compared to patients without symptoms, patients with moderate, severe, and critical symptoms. Meanwhile, the CT Value of 30-37 was obtained in asymptomatic pediatric patients, and

E-ISSN: 2528-410X

pediatric patients with critical clinical degrees. The CT Value of 38-40 is found in children with mild and moderate clinical symptoms.. The results of this study are almost the same as the previous research conducted by *Angela et al,* in this study it was stated that a lower CT Value value was obtained in child patients with symptoms compared to asymptomatic child patients.[41] A similar thing is also found in a study conducted by *Baijayantimala et al.,* conducted at the Institute of Medical Sciences Bhubaneswar, India. In this study, it was stated that patients with lower CT Values were found compared to patients without symptoms.[42]

Based on the medical record data obtained from the CT Value and the clinical degree of pediatric patients with COVID-19, a relationship was found if the significance value was < 0.05. If the significance value on Chi Square is <0.05, then the CT Value has a significant relationship with the clinical degree of the child with COVID-19. In the study conducted by *Rao et al*., there are eleven studies that have reported a correlation between the CT Value value and the degree of clinical severity of patients with COVID-19. And lower CT Values through respiratory samples were associated with more severe disease. The other three studies also showed a correlation between viral load determined by CT and more severe disease.[43] According to *Angela et al'* s research, results showed a correlation between symptoms and CT Value as a proxy *viral load* which is recommended as a strategy to determine the risk of transmission and severe disease in children with COVID-19. [41] Another study conducted by *Baijayantimala et al*, found that a higher viral load characterized by lower CT Vlue (CT < 25) was found in asymptomatic patients (67%).

In some studies, results were obtained that were inversely proportional to the results of this study, this was caused by several factors such as the sample collection technique, and the time of sample collection which could be related to the onset of symptoms.[44]

CONCLUSION

1. The most pediatric patients diagnosed with COVID-19 at Bunda Thamrin Hospital in Medan were 112 years old ≥ 5 years old (67.88%).
2. The gender of pediatric patients diagnosed with COVID-19 at Bunda Thamrin Hospital Medan was dominated by 97 male pediatric patients (58.79%).
3. The clinical degree of pediatric patients with a diagnosis of COVID-19 based on the interval *of CT Value* at Bunda Thamrin Hospital Medan from a total of 165 children can be seen that at the *CT Value* of < 29 there are 8 children (4.84%) without symptoms, 108 children (65.45%) with mild clinical degrees, 4 children (2.4%) with moderate clinical degrees, 23 children (13.9%) with severe clinical degrees and 0 children (0%) with critical clinical degrees. In *the*

E-ISSN: 2528-410X

CT Value of 30 – 37, it can be seen that there are 0 children (0%) without symptoms, 18 children (10.91%) with mild clinical degrees, 2 children (1.2%) with moderate clinical degrees, 0 children (0%) with severe clinical degrees and 1 child (0.6%) with critical clinical degrees. At *the CT Value* of 38 – 40, it can be seen that there are 0 children (0%) without symptoms, 1 child (0.6%) with mild clinical degree, 2 children (1.2%) with moderate clinical degree, 0 children (0%) with severe clinical degree and 0 children (0%) with critical clinical degree.

4. Pediatric patients with COVID-19 at Bunda Thamrin Hospital Medan were dominated by 126 children with mild severity (76.4%).
5. The length of treatment of pediatric patients with COVID-19 at Bunda Thamrin Hospital in Medan is dominated by less than 10 days.
6. Based on the output of pediatric patients with COVID-19 at Bunda Thamrin Hospital in Medan, it was found that as many as 160 children (97%) were isolation patients.
7. Obesity is the most common comorbid disease found in children with a diagnosis of COVID-19 in 51 children (67.1%).
8. The significance value < 0.05. If the significance value on *Chi Square* is <0.05 then *CT Value* has a significant relationship with the Clinical Degree of Pediatric Patients diagnosed with COVID-19.

SUGGESTION

1. It is hoped that similar research will be carried out in different hospitals.
2. It is hoped that similar research will be carried out by taking different samples.
3. It is hoped that further research involves various other factors that can affect the success of the research.
4. It is hoped that the clinicians can provide education and prevention regarding COVID-19 transmission to the community.

REFERENCES

1. Zhou M, Zhang X, Qu J. Coronavirus Disease 2019–COVID-19. Published Online. 2020: 14 (2): 126-135.
2. Cascella M, Rajnik M, Aleem A, Dulebohn S, Di Napoli R. Features, Evaluation, and Treatment of Coronavirus (COVID-19). StatPearls. 2020.
3. Borrelli M, Corcione A, Castellano F, Fiori Nastro F, Santamaria F. Coronavirus Disease 2019 in Children. Front Pediatric. 2021;9.
4. Indonesia COVID-19 Response Situation Report. UNICEF Indonesia. 2021.

E-ISSN: 2528-410X

5. Adeyinka A, Bailey K, Pierre L, Kondamuni N. COVID 19 infection_ Pediatric perspectives. 2021: 2 (1).
6. Candrawati NW, Cassidy WR. Interpretasi nilai Cycle Threshold (CT) Reverse Transcriptase-Polymerase Chain Reaction (RT-PCR) SARS-CoV-2 pada pasien hamil dengan uji antibodi SARS-CoV-2 positif dan COVID-19 asimtomatik. Intisari Sains Medis. 2021;12(3):822.
7. Seiden David, James White. STEP 1 Lecturer Notes 2018 USMLE. 2018.
8. Prastyowati, Anita. Bioteknologi - Lipi P. Mengenal Karakteristik Virus SARS-CoV-2 Penyebab Penyakit COVID-19 Sebagai Dasar Upaya Untuk Pengembangan Obat Antivirus Dan Vaksin. Bioteknologi- Lipi P. 2019. Vol 11.
9. Agustiningsih. PemeriksaanPCR SARSCoV2 Bagi Petugas Laboratorium. 2020.
10. Rathore V, Galhotra A, Pal R, Sahu KK. COVID-19 pandemic and children: A review. Journal of Pediatric Pharmacology and Therapeutics. 2020; 25(7):574-585.
11. Wuhan WQ, Yongxi Z, Siyang C, Xiaomao J. Hubei Science and Technology Press A Handbook of 2019-NCoV Pneumonia Control and Prevention. 2020: 16(10):1745-1752.
12. Borrelli M, Corcione A, Castellano F, Fiori Nastro F, Santamaria F. Coronavirus Disease 2019 in Children. Front Pediatr. 2021;9.
13. Rabinowicz S, Leshem E, Pessach IM. COVID-19 in the Pediatric Population-Review and Current Evidence. Published online 1908. 2020:22(11):29.
14. Cui X, Zhang T, Zheng J, et al. Children with coronavirus disease 2019: A review of demographic, clinical, laboratory, and imaging features in pediatric patients. J Med Virol. 2020;92(9):1501-1510.
15. Galindo R, Chow H, Rongkavilit C. COVID-19 in Children: Clinical Manifestations and Pharmacologic Interventions Including Vaccine Trials. Pediatr Clin North Am. 2021;68(5):961-976.
16. Adeyinka A, Bailey K, Pierre L, Kondamudi N. COVID 19 infection: Pediatric perspectives. J Am Coll Emerg Physicians Open. 2021;2(1).
17. Yuki K, Fujiogi M, Koutsogiannaki S. COVID-19 pathophysiology: A review. Clinical Immunology. 2020;215.
18. S GMY, G RDW. Contributed New Reagents/analytic Tools. Published online. 2021.
19. Levani Y, Dwi Prasetya A, Mawaddatunnadila S. Coronavirus Disease 2019 (COVID-19): Patogenesis, Manifestasi Klinis dan Pilihan Terapi. 2021.
20. Shen K, Yang Y, Wang T, et al. Diagnosis, treatment, and prevention of 2019 novel

E-ISSN: 2528-410X

coronavirus infection in children: experts' consensus statement. World Journal of Pediatrics. 2020;16(3):223-231.
21. Han X, Li X, Xiao Y, Yang R, Wang Y, Wei X. Distinct Characteristics of COVID-19 Infection in Children. Front Pediatr. 2021;9.
22. Alsohime F, Temsah MH, Al-Nemri AM, Somily AM, Al-Subaie S. COVID-19 infection prevalence in pediatric population: Etiology, clinical presentation, and outcome. J Infect Public Health. 2020;13(12):1791-1796.
23. Saleem H, Rahman J, Aslam N, Murtazaliev S, Khan S. Coronavirus Disease 2019 (COVID-19) in Children: Vulnerable or Spared? A Systematic Review. Cureus. Published online. 2020.
24. Siappa Tonglolangi O, Pratiningrum M. Hubungan Gejala Klinis Dengan Nilai CT Pada Pemeriksaan Real-Time PCR SARS-CoV-2. 2021. Vol 8.
25. Cura Yayla BC, Ozsurekci Y, Aykac K, et al. Characteristics and Management of Children With COVID-19 in Turkey. Balkan Med J. Published online. 2020.
26. Shi H, Han X, Jiang N, et al. Radiological findings from 81 patients with COVID-19 pneumonia in Wuhan, China: a descriptive study. Lancet Infect Dis. 2020;20(4):425-434.
27. Ikatan Dokter Anak Indonesia Edisi 3 Panduan Klinis Tata Laksana COVID19 Pada Anak. 2020.
28. Long C, Xu H, Shen Q, et al. Diagnosis of the Coronavirus disease (COVID19): rRT-PCR or CT?. Eur J Radiol. 2020;126.
29. Sule WF, Oluwayelu DO. Real-time RT-PCR for COVID-19 diagnosis: challenges and prospects. Pan Afr Med J. 2020;35:121.
30. Rao Davide Manissero Victoria R Steele Josep Pareja SN. A Systematic Review of the Clinical Utility of Cycle Threshold Values in the Context of COVID-19. 2020.
31. Tom MR MMJ. To Interpret the SARS- CoV-2 Test, Consider the Cycle Threshold Value.ClinInfectDis.2020;71(16):2252-2254. To Interpret the SARS-CoV-2 Test, Consider the Cycle Threshold Value. ClinInfectDis. 2020;71(16):2252-2254.
32. Siappa Tonglolangi O, Pratiningrum. Hubungan Gejala Klinis Dengan Nilai CT Pada Pemeriksaan Real-Time PCR SARS-CoV-2. 2021. Vol 8.
33. Sankar J, Dhochak N, Kabra SK, Lodha R. COVID-19 in Children: Clinical Approach and Management. Indian J Pediatr. 2020;87(6).
34. Hong H, Wang Y, Chung HT, Chen CJ. Clinical characteristics of novel coronavirus disease 2019 (COVID-19) in newborns, infants and

E-ISSN: 2528-410X

children. Pediatr Neonatol. 2020;61(2):131-132.
35. Liu K, Zhang W, Yang Y, Zhang J, Li Y, Chen Y. Respiratory rehabilitation in elderly patients with COVID-19: A randomized controlled study. Complement Ther Clin Pract. 2020;39.
36. Heny Purwati N, Noprida D, Agustia W, et al. Impact of Age and Gender on the Incidence of COVID-19 in Children at Pasar Rebo Hospital, Jakarta. KnE Life Sciences. 2022.
37. Penna C, Mercurio V, Tocchetti CG, Pagliaro P. Sex-related differences in COVID-19 lethality. Br J Pharmacol. 2020;177(19):4375-4385.
38. George M. Coronavirus: Why Men are More Vulnerable to COVID-19 Than Woman?. SN Compr Clin Med. 2020; 2 (7): 874-876.
39. Zachariah P. COVID-19 in Children. Infect Dis Clin North Am. 2022;36(1):1-14.
40. Nagy É, Cseh V, Barcs I, Ludwig E. The Impact of Comorbidities and Obesity on the Severity and Outcome of COVID-19 in Hospitalized 41 Universitas Muhammadiyah Sumatera Utara Patients—A Retrospective Study in a Hungarian Hospital. Int J Environ Res Public Health. 2023;20(2).
41. Sattar N, McInnes IB, McMurray JJV. Obesity Is a Risk Factor for Severe COVID-19 Infection: Multiple Potential Mechanisms. Circulation. Published online 2020:4-6.
42. Gentile A, Juarez MDV, Lucion MF, et al. COVID-19 in Children: Correlation Between Epidemiologic, Clinical Characteristics, and RT-qPCR Cycle Threshold Values. Pediatric Infectious Disease Journal. 2022;41(8):666-670.
43. Mishra B, Ranjan J, Purushotham P, et al. Comparison of Cycle Threshold and Clinical Status Among Different Age Groups of COVID-19 Cases. Cureus.2022.
44. Rao Davide Manissero Victoria R Steele Josep Pareja SN. A Systematic Review of the Clinical Utility of Cycle Threshold Values in the Context of COVID-19. Infect Dis Ther. 2020.
45. Mishra B, Ranjan J, Purushotham P, et al. Comparison of Cycle Threshold and Clinical Status Among Different Age Groups of COVID-19 Cases. Cureus. 2022.