

MOTORIC AND COGNITIVE DEVELOPMENT OF TODDLERS IN MOTHERS WITH A HISTORY OF COVID-19 IN GORONTALO CITY, INDONESIA

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Abstract

Pregnant women with symptoms of Covid-19 infection are more vulnerable than non-pregnant women with Covid-19. SARS-CoV-2 virus infection during pregnancy can increase the risk of maternal and fetal health complications and develop into severe pneumonia besides explaining that maternal psychosocial factors during labor, such as high levels of stress and low social support, can affect poorer cognitive and motor development in toddlers. To evaluate the development of toddlers in mothers who have a history of Covid-19 and mothers who are not confirmed with Covid-19. The research design used in this study was quantitative research. Quantitative research method with analytic observational research design with cross sectional design. The sample was divided into 2 groups, namely 39 toddlers born to Covid-19 mothers and 39 toddlers born to mothers who were not confirmed with Covid-19 obtained from secondary data at Aloe Saboe Hospital, Gorontalo city. There is no association between toddlers born during the Covid-19 pandemic with the motor, social and language development of toddlers, namely with a p result of 0.745 ($p > 0.05$) while for cognitive development a significance value of p is obtained 1,000 ($p > 0.05$) so it is concluded that there is no association of toddlers born during the Covid-19 pandemic with the Cognitive development of toddlers. Toddlers born during the pandemic to both Covid-19 mothers and mothers who are not confirmed with Covid-19 do not automatically cause developmental problems in toddlers, and many children born to mothers with a history of covid-19 still show normal and healthy development.

Keywords: Covid-19, Development, Toddler.

INTRODUCTION

The COVID-19 pandemic, caused by the Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) virus, has presented serious challenges to global health systems and communities around the world.(1) In an effort to control the spread of this disease, rapid and accurate detection of SARS-CoV-2 is key in identifying cases, isolating them, and reducing the risk of transmission.¹

The first COVID-19 case in Indonesia was announced on March 2nd, 2020 or about 4 months after the first case in Wuhan, China October 11th, 2021 the number of COVID-19 cases in Indonesia has reached ± 4 million cases. Referring to data from the Ministry of Health in 2021, the number of cases of pregnant women confirmed positive for COVID-19 reached 35,099 while newborns 0-12 months were 24,591.

Pregnant women with symptoms of Covid-19 infection are more vulnerable than non-pregnant women with Covid-19.²

SARS-CoV-2 virus infection during pregnancy can increase the risk of maternal and fetal health complications and progress to severe pneumonia.³ Pregnant women and infants are particularly susceptible to COVID-19 because the physiological changes of pregnancy involve the cardiorespiratory and immune systems, which may result in altered responses to SARS-CoV-2 infection in pregnancy.

Physiological changes during pregnancy have a significant impact on the immune system, respiratory system, cardiovascular function, and coagulation which have positive or negative effects on the development of COVID-19 disease.⁴

According to UNICEF data the number of wasted or acutely malnourished children under 5 years old may increase globally by about 15 percent this year due to COVID-19. The reduction in the number of visits to Posyandu integrated healthcare Center during the Covid- 19 Pandemic can be influenced by various factors related to maternal behavior as part of parenting toddlers.⁵

Based on the results of SSGI (Indonesian Nutritional Status Survey) 2022, the prevalence of stunting during the pandemic showed a decrease from 24.4% in 2021 to 21.6% in 2022, but the prevalence of underweight increased from 17.0% to 17.1%, and when viewed from WHO standards in Indonesia, the province of Bali is still a province that has a good nutritional status in toddlers. ⁶

The Indonesian Obstetrics and Gynecology Association (POGI) states that most of the pregnant women who are exposed to COVID-19 when the womb age is approaching the date of delivery and need health services, Gorontalo Province in September 2022 the number infected with Covid -19 reached more than 13,973 and died more than 400 cases (Gorontalo provincial Health Office).

In Gorontalo province, one of the Covid-19 referral hospitals is Aloe Saboe Hospital for prenatal and intranatal care. Initial studies at Aloe Saboe Hospital showed that the number of sectio caesarea, spontaneous and vacuum deliveries in 2020-2022 were 463 mothers who gave birth during the Covid-19 pandemic and for Gorontalo City there were 252 mothers who gave birth during the Covid-19 pandemic and for mothers who gave birth who were confirmed positive for COVID-19 there were 191 in Gorontalo Province.

Based on the explanation above, the researcher is interested in examining the challenge of “Motoric and Cognitive Development of Toddlers in Mothers Who Have a History of Covid-19”, the purpose of this study is to analyze the comparison of motoric, social, language and cognitive development in mothers who have a history of Covid-19 and mothers who are not confirmed Covid-19.

METHODS

Study design and setting

The research design used in the study was quantitative research. Quantitative research method with analytical observational research design with cross sectional design. data on mothers who gave birth during the Covid-19 pandemic from 2020 to 2022 were obtained retrospectively through medical records at Aloe Saboe Hospital Gorontalo City.

Data on toddler development was obtained through observation data, namely direct examinations carried out on toddlers in the Gorontalo City Health Center Working

Area. The samples in this study were toddlers born during the Covid-19 pandemic from 2020 to 2022.

Research participants and sampling

The population in this study were toddlers born during the COVID-19 pandemic from 2020 to 2022 who were born at Professor Aloe Saboe Hospital in Gorontalo city aged 12 months - 60 months and the affordable population in the study were toddlers born to COVID-19 mothers and toddlers born to mothers who were not COVID-19 adjusted for age and number of toddlers born during the Covid-19 period.

The sampling technique is exhaustive sampling that meets the inclusion criteria, with a total sample of 39 toddlers born to mothers with a history of Covid-19 and 39 toddlers born to mothers who were not confirmed with Covid-19 but were born during the Covid-19 pandemic.

Data collection and tools

Data collection tools related to maternal demographic data on COVID-19 history were obtained through medical records at Professor Aloe Saboe Hospital, Gorontalo city. Data collection tools for Cognitive Development and motor, social and language development in toddlers use KPSP (Developmental Pre-screening Questionnaire) sheets from the Ministry of Health and cognitive development observation sheets from memography books.

Ethical considerations

This research was carried out with the permission of the Ethics Committee of the Faculty of Public Health, Hasanuddin University to all respondents who were given a full explanation of the actions that would be taken to respondents before conducting research.6284/UN4.14.1/TP.01.02/2023

Variable Measurement

Covid-19 status is measured by media tests such as positive PCR test results, severity and symptoms experienced, development is measured by observing abilities according to age stages.

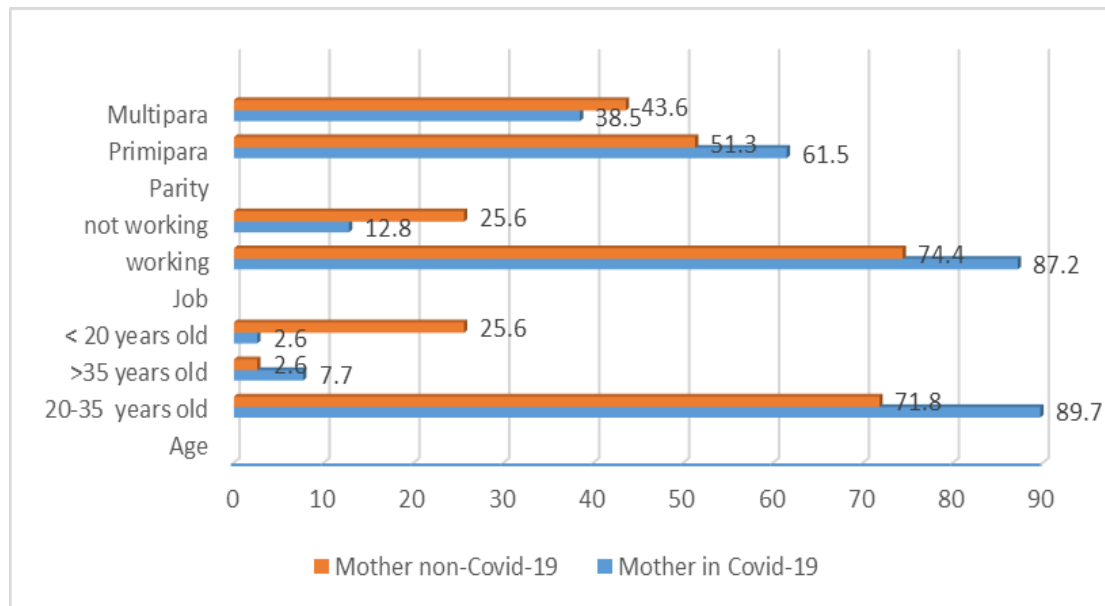
Statistical data analysis

Data analysis obtained the relationship between the intervention group and the control group with an unpaired t test. Data was significant if $p < 0.05$ through chi square test.

RESULTS AND DISCUSSION

Research on the development of toddlers in mothers with a history of Covid-19 has been conducted at Aloe Saboe Hospital Gorontalo City for secondary data collection, as well as 8 health centers in Gorontalo City for primary data.

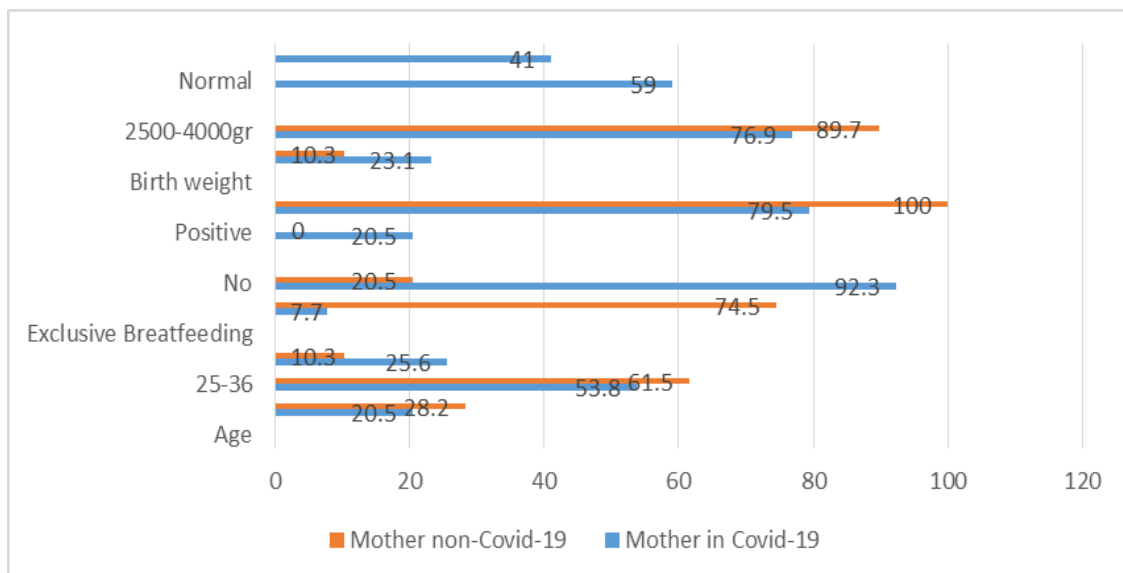
The subjects in the study amounted to 78 toddlers born during the Covid-19 pandemic with two divisions, namely 39 toddlers born to Covid-19 mothers and 39 mothers who were not confirmed with Covid-19 in accordance with the inclusion and exclusion criteria, the study was conducted from December 2023 - March 2024.



Graphic 1: Characteristics of respondent mothers

Characteristics of respondent mothers include age, occupation, and parity. Based on age, most respondent mothers were in the range of 20-35 years, with 35 (89.7%) mothers confirmed with Covid-19 and 28 (71.8%) mothers who were not confirmed with Covid-19.

Most respondent mothers did not work, with 34 (87.2%) Covid-19-confirmed mothers and 29 (74.4%) non-confirmed mothers. The most common parity in both groups was primiparous, with 24 (61.5%) mothers with confirmed Covid-19 and 20 (51.3%) mothers without confirmed Covid-19.



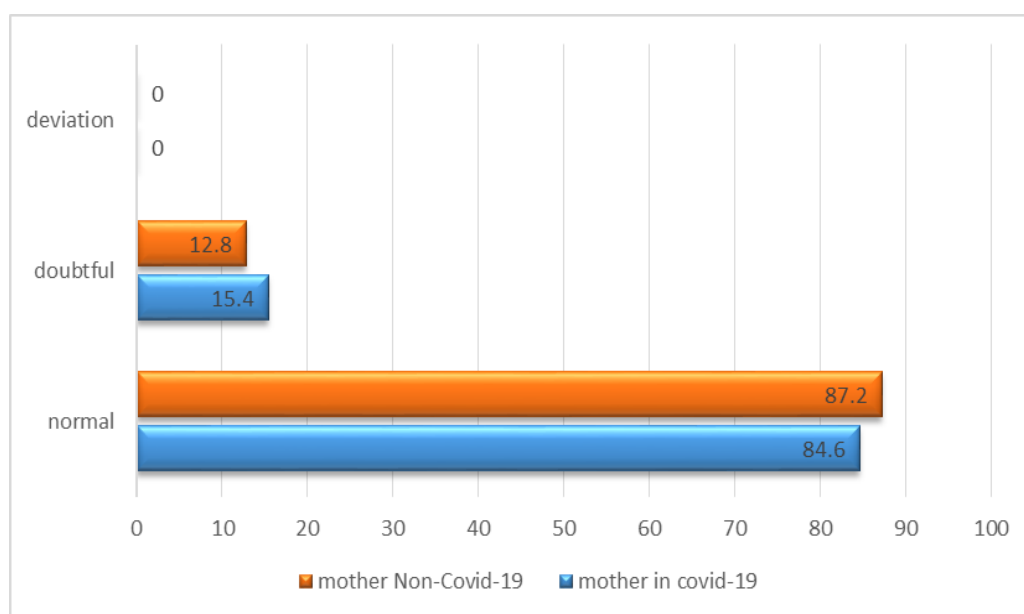
Graphic 2: Respondents' characteristics

The characteristics of respondents consisted of age, exclusive breastfeeding, birth weight, birth weight of labor process and Covid-19 history. Toddlers aged 25-36 months were found more in mothers with confirmed Covid-19, namely 23 (59.0%), and in mothers who were not confirmed Covid-19, namely 25 (64.1%).

Infants born to mothers with a history of Covid-19 were mostly born uninfected with Covid-19 (negative) 31(79.5).The birth process of toddlers from mothers with confirmed Covid-19 occurred normally, as many as 23 (59.0%), while toddlers from mothers without confirmed Covid-19 were born normally as many as 29 (74.4%).

The weight of children under five at birth was mostly in the normal category, with 27 (69.2%) children from Covid-19-confirmed mothers and 32 (82.1%) children from non-Covid-19-confirmed mothers.

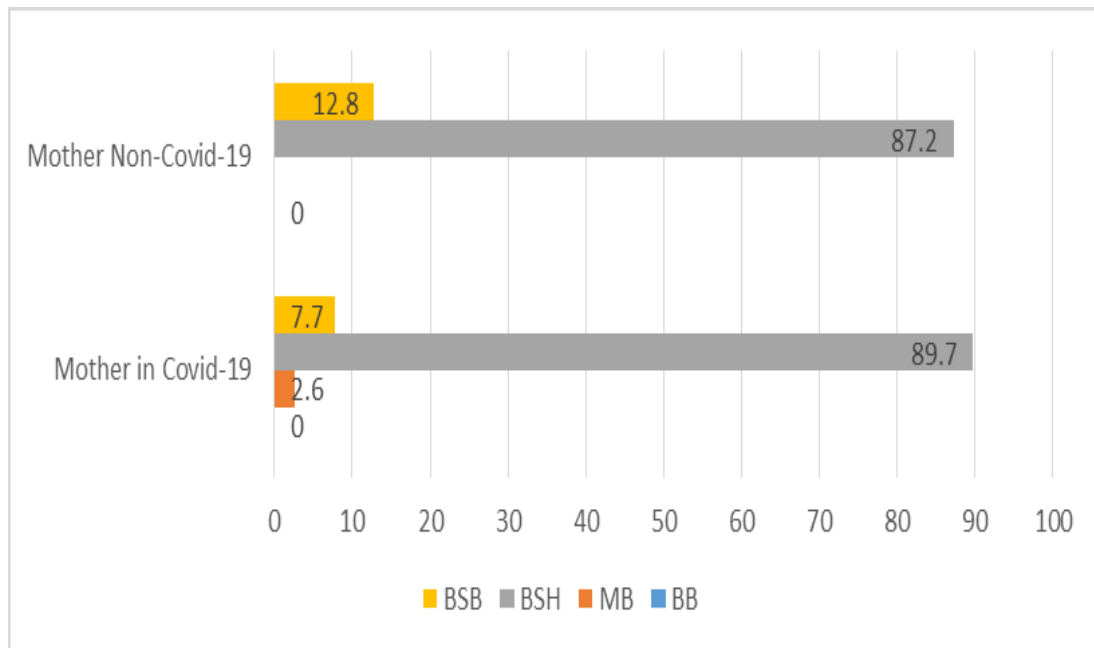
Most of the toddlers in both groups of respondents were born with a normal body weight of 2500-4000 grams, and almost half of them had a body length of less than 48 cm. Exclusive breastfeeding characteristics in infants born during the pandemic were mostly not exclusively breastfed 36(92.3) while in mothers who were not infected with Covid-19, 31(74.5) were exclusively breastfed.



Graphic 3: Analysis of motoric, social and language development of toddlers in mothers with a history of Covid-19 and not confirmed Covid-19

Based on the table and graph above, that the development with doubt amounted to 6 (15.4%) toddlers from mothers who confirmed Covid-19 and the rest was the development of toddlers according to age, namely 33 (84.6%) toddlers from mothers who confirmed Covid-19 while in toddlers with mothers who were not confirmed Covid-19 there were 5 (12.8%) dubious developments and the rest were developments according to age, namely 34 (87.2%) toddlers from mothers who were not confirmed Covid-19.

The statistical test results showed a p value of 0.745 ($p > 0.05$) so it can be concluded that there is no association between toddlers born during the Covid-19 pandemic with motor, social and language development of toddlers.



Graphic 4: Analysis of the Cognitive development of Toddlers in Mother with a History of Covid-19 and not Confirmed Covid-19

Note.

- BB : Not Yet Developed
- MB : starting to develop
- BSH : Developing as Expected
- BSB : Developing Very Well

Based on the graph above, toddlers born to mothers with Covid-19 experienced more cognitive development in the BSH (Developing As Expected) category as many as 35 (89.7%). Similarly, toddlers born to mothers who were not confirmed with Covid-19 also experienced more cognitive development in the BSH category as many as 34 (87.2%). The statistical test results showed a p value of 0.469, so it can be concluded that there is no association between toddlers born during the Covid-19 pandemic with cognitive development of toddlers.

Mothers of toddlers of both groups are in reproductive age, namely 20-35 years, which is a safe age to accept pregnancy and childbirth, and the addition of nutrients will be better because at that age the reproductive organs have begun to function properly.^{7,8} Mothers who do not work more often have verbal and responsive interactions with their babies so that they can influence parenting towards children, while working mothers affect parenting so that it will have an impact on child growth and development besides the length of time working also plays an important role in interaction with children.^{9,10}

According to the research, primiparous mothers do not have experience of childbirth and caring for babies, but there are many ways that primiparous mothers can do, namely by asking parents, close friends in particular, besides that primiparous mothers can also seek information from social media, books and magazines so that they can add to the mother's insight into childbirth and caring for babies.¹¹

Toddlers experience very rapid development, because at that time it is the golden period of toddlers, the golden period is very decisive for developing human quality in the next stage of development. In addition, balanced nutrition is very influential for the process of toddler development to run well.^{12,13} The male gender is usually faster in motor development because generally boys provide a lot of energy and concentration on physical activities. Other research results show that if the male sex is born prematurely, it can be considered a significant biological risk factor for infant cognitive and motor development.^{14,15}

According to the results of research conducted by Pinheiro et al that there is no relationship between Covid-19 exposure in pregnancy and developmental delays in toddlers.¹⁶ Ayed et al. wrote in their research results that delayed toddler development occurred in infants born to mothers infected with Covid-19 in the first and second trimesters compared to the third trimester ($P < 0.001$). 4(13.3%) were born to mothers infected with Covid-19 in the first trimester, 6(20%) were born to mothers infected in the second trimester and 20(66.7) were born to mothers infected with Covid-19 in the third trimester. From these births, only 2(0.7%) babies tested positive for Covid-19 infection and both had normal developmental outcomes.¹⁷

From the results of research conducted by deoni et al, it was explained that there were no symptoms of SARS-CoV-2 or the impact of this virus on cognitive development and motor development, although in this study some children experienced a decrease in motor abilities, communication and skills and cognition but this was observed to be more related to environmental factors and not a direct effect of Covid-19 infection.¹⁸

According to research published in the international journal of pediatrics, there is no significant relationship between a mother's Covid-19 history and her child's growth and development. The study conducted by the researchers aimed to investigate the potential impact of a mother's Covid-19 history on her child's development.¹⁹

The researchers recruited a sample of mothers and children who tested positive for Covid-19 during pregnancy or had a history of Covid-19 before pregnancy. The researchers collected data on various developmental indicators such as cognitive, motor, and socio-emotional development of the children at different time points, the study revealed that there was no significant difference in developmental outcomes between children whose mothers had a history of Covid-19 and children whose mothers did not have a history of Covid-19.²⁰

This suggests that the mother's previous exposure to Covid-19 does not have a direct impact on her child's developmental trajectory, there are several other factors and variables that can contribute to the child's developmental outcomes, such as genetic factors, socioeconomic status, and the environment in which they grew up.^{21,22}

Further research is needed to fully understand the potential impact of Covid-19 on child development, taking into account other relevant factors such as overall maternal health, socioeconomic status, and access to health services, as well as parental factors. Based on the sources provided, there is insufficient evidence or specific journal articles that directly mention the relationship between a mother's Covid-19 history and her child's development.^{23,24}

CONCLUSION

Toddlers born during the pandemic both to mothers with confirmed Covid-19 and those who were not confirmed did not significantly cause problems in the development of toddlers, and many children born to mothers with a history of covid-19 still showed normal and healthy development. but although statistically there is no significant association all toddlers born during the pandemic are at risk of developmental disorders, so it is necessary to carry out regular monitoring measures according to the age of the toddler to find out if deviations occur so that they can be detected early.

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