



Exploration of Nurse Knowledge with Splints on Fracture Patients in Hospitals

Prestasianita Putri, Alfid Tri Afandi, Yunus Saifur Rizal

Impact of Burnout on Nurse Performance in the Inpatient Ward: A Literature Review

Leni Agustin

Implementing Disaster Simulation for Undergraduate Nursing Students

Eko Prasetya Widyanto, Arista Maisyaroh, Rizeki Dwi Fibriansari, Syaifuddin Kurnianto, Candra Alif Novyanto

Cupping as a Special Therapy for Health Services in Tourist Attractions: Literature Review

Dwi Indah Lestari, Siti Riskika, Alwan Revai, Destia Widyarani

Exploration Postpartum Sectio Caesarea with Ineffective Breastfeeding: A Case Report

Sri Wahyuningsih, Nurul Hayati, Rizeki Dwi Fibriansari, Nindi Bilih

The Relationship between Socioeconomic and Nutritional Status with the Incidence of Pulmonary Tuberculosis at the Nangkaan Public Health Center Bondowoso

Damon Wicaksi, Yuni Priyo Wahyudi, Shelly Dwi Kurniawati Atmadja

The Effect of Humor as a Stress Management for Nurses Working in Hospital: Systematic review

Rany Agustin Wulandari, Hamidah Retno Wardani

Risk Factor Analysis of Covid-19 in Children: Literature Review

Musviro, Siti Rohania A.S, Nurul Hayati, Rizki Dwi Fibriansari

Overview of Nurses Factors about Safety Behavior of Infusing in the Emergency Room (ER) of Lumajang Regional Hospital

Dwi Ochta Pebriyanti



Risk Factor Analysis of Covid-19 in Children: Literature Review

Musviro¹, Siti Rohania², Nurul Hayati³, Rizki Dwi Fibriansari⁴

^{1,2,3,4}Faculty of Nursing, Universitas Jember, Jember, Indonesia

¹Corresponding author: musviro@unej.ac.id

ABSTRACT

Introduction: COVID-19 is currently a serious disease in many countries around the world. A children are one of the vulnerable groups for COVID-19 transmission. One of the ways to prevent the occurrence of COVID-19 in children is by knowing the risk factors for the occurrence of COVID-19 in children. The purpose of this study was to analyze the risk factors for the occurrence of COVID-19 in children.

Method: The method used in the preparation of the Literature review using PICOS. The secondary data obtained came from journals with a predetermined discussion. Based on the results of a literature search through six databases. Researchers get 447 articles that match the keywords. The researcher then screened based on the title (n=242), abstract (n=107) and full text (n=10) which were adjusted to the inclusion criteria.

Result: There are 3 risk factors for the occurrence of COVID-19 in children. Family exposure is the highest risk factor because the family does not realize that they have been exposed outside the home and accidentally transmit COVID-19 to their children. The second risk factor is kunderlying health condition of the child. The child's underlying health conditions can cause symptoms that appear due to COVID-19 to be more severe. The third risk factor is immunity. The immune system in children is still low and not perfect because children are still in the developmental stage.

Conclusion: Risk factors for COVID-19 in children include: family exposures, underlying health conditions, and immunity. This risk factor is a step to prevent COVID-19 in children so that this factor needs to be known by the wider community.

Keywords: Risk Factor; Children; COVID-19

Introduction

COVID-19 is a disease that attacks the respiratory system which is a serious health problem today in various countries in the world. COVID-19 can attack all age groups including children (Oualha et al., 2020). Indonesia has the highest number of cases of COVID-19 in children compared to other countries. Children are invisible victims who are one of the vulnerable groups for COVID-19 transmission who have a high/sensitive risk of contracting COVID-19 infection (UNICEF, 2020). If the risk factors for the occurrence of COVID-19 in children are not immediately addressed, it will have both short-term and long-term impacts. In the short impact that occurs in children, the child will experience disturbances in his lungs, because COVID-19 attacks the child's respiratory system so if it is not treated quickly it can cause more severe problems such as the child will experience severe shortness of breath and can even cause death. Meanwhile, in the long term, if it is not immediately identified and handled properly, it will affect the welfare, development and future of children (UNICEF, 2020).

CDC data (2020) states that the incidence of COVID-19 in children in America, China, Italy and the UK reaches 0.8%-2.2% of the total number of confirmed cases. In Indonesia, confirmed cases of COVID-19 in children are 7.76% of the total cases (Kemenkes RI, 2020). This figure is higher when compared to case reports in several countries in the world. The incidence of COVID-19 in children is influenced by several factors such as family exposure 23%, underlying health conditions 17%, and body immunity 5% of all confirmed cases (CDC, 2020).

The World Health Organization named this new virus severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and the name of the disease as Coronavirus Disease 2019 (COVID-19) (WHO, 2020). COVID-19 is a respiratory disease caused by a new type of corona virus that has never been previously identified in humans (Mulati, 2020). Transmission of SARS-CoV-2 can be through contact, droplet, airborne, fecal-oral and mother to child. Then this virus enters the open mucosa (IDAI, 2020). After the spread, the virus will enter the respiratory tract and replicate (perform its life cycle). Then the virus will spread to the lower respiratory tract. In acute infection, viral shedding occurs from the respiratory tract and the virus may continue to shed for some time in gastrointestinal cells after healing.(Yuliana, 2020). Corona virus can attack anyone, including children (Mulati, 2020). Although the symptoms that occur in children are milder than adults, as a parent, community or health worker, it is important

to know the risk factors for COVID-19 in children. These factors are family exposure, underlying health conditions and immunity.

COVID-19 that occurs in children from confirmed cases stating that they got it from family or adults who have been exposed to COVID-19 before (Dong et al., 2020). The family is the smallest group that gathers and lives together in a house, and is interdependent and interacts with one another. If one of them is sick or unwell, it will affect the health of other family members (Bialek et al., 2020). Children are very closely related to the family. Especially when the implementation of social distancing, families who initially worked outside the home were directed to work or carry out activities from home. This makes the relationship between children and families closer. So, when the child is in direct contact with family members who have been exposed to COVID-19, the child will be at risk of being infected with COVID-19. (Li et al., 2020).

Health conditions or diseases experienced by the child previously such as having a degenerative disease will affect the child's immunity. Degenerative diseases cause the child's immune system to become weak so that it is more difficult to fight the incoming virus. COVID-19 caused by Corona virus infection will easily attack children who have weak immunity. In addition, most children who have degenerative diseases have experienced organ damage. So that when infected with the Corona virus, the damage to these organs can become more severe, so the symptoms that occur due to COVID-19 that appear can be more severe.

The role of the immune system in the human body is very important to maintain health and provide protection from various harmful substances from outside. A weakened immune system in the body will cause bacteria or viruses to easily infect the body which triggers many diseases. A child's decreased body immunity will cause the child's immune system to weaken so that it puts these children at risk of being infected with COVID-19 (Noya, 2019). Because the child is still in the developmental stage, the child's immune system is still and not perfect. In addition, there is no vaccine that can prevent COVID-19. Thus, children are still very at risk of being infected with COVID-19.

Symptom COVID-19 in children is milder than adults, however, if the risk factors for COVID-19 are not known, it will have a significant impact on children. UNICEF has called on the government to realize that “children are invisible victims” given the

existence of short-term and long-term impact on children's health, well-being, development, and future (UNICEF, 2020). The purpose of this research to analyze risk factors for COVID-19 in children.

Method

The method used in the preparation of the Literature review uses PICOS. The literature search was carried out in June - July 2020. This study used secondary data that had been conducted by previous researchers with child respondents. Secondary data sources which can be in the form of reputable journal articles both nationally and internationally with predetermined themes. Methods of data collection with electronic databases are carried out by Elsevier, Springer, NCBI, Pubmed, ProQuest, and Scient Direct. Based on the results of a literature search through publications in six databases and using keywords that have been adjusted to MeSH, the researchers found 447 articles that matched these keywords. The search results that have been obtained are then checked for duplication through the "Copyscape" website to find out duplication of articles and it was found that there were 205 similar articles, so they were removed and 242 articles were left. The researcher then conducted a screening based on the title (n = 242), abstract (n = 107) and full text (n = 50) which was adjusted to the theme of the literature review. The assessment based on the feasibility of the inclusion and exclusion criteria was calculated manually and obtained as many as 10 articles that were adjusted to the inclusion criteria.

Result

The incidence of COVID-19 in children is influenced by several factors such as family exposure, underlying health conditions, and body immunity from all confirmed cases (CDC, 2020). Among the three factors that become the most dominant risk of Covid-19 in children is Family Exposure.

Discussion

1. Family Exposure Risk Factors

Most of the research results stated that cases of children who were confirmed to have COVID-19 got them from family or adults who had previously been exposed to COVID-19. Children are also infectious, not contagious (Li et al., 2020; Dong et al., 2020). The family is the smallest group that gathers and lives together in a house, and is interdependent and interacts with one another. If one of them is sick or unwell, it will affect the health of other family members (Bialek et al., 2020). Contacts are defined by individuals who are related to one another. Contact includes household members, family contacts, neighbors, and members of social groups. Close contact can be defined as someone who has contact (within 1 meter) with a confirmed case during the incubation period including one day before symptoms appear (Sediva, 2020).

Children still have low body mechanisms compared to adults, so children are included in a group that is prone to infection (Mulati, 2020). Children are invisible victims and are one of the vulnerable groups for COVID-19 transmission have a high risk / sensitive infected with COVID-19 (UNICEF, 2020). So, when children come into direct contact with family members who have been exposed to COVID-19, the child will be at risk of being infected with COVID-19.

This is in line with research conducted by Xin et al., (2020) with the title Risk factors associated with occurrence of COVID-19 among household persons exposed to patients with confirmed COVID-19 in Qingdao Municipal, China. In the study, it was said that pediatric patients with confirmed COVID-19 were obtained from household exposure, this was proven by checking the respiratory specimen with the real-time RT-PCR method. Asymptomatic cases of COVID-19 were defined as persons given positive detection of SARS-CoV-2 in respiratory or other specimens by real-time RT-PCR method without clinical symptoms. Close contact is defined as a person who has a history of short-term contact since two days before the onset of symptoms in a suspected and confirmed COVID-19 case. With the results, most of the children who were confirmed positive for Covid-19 were obtained from household exposure.

2. Risk Factors for Underlying Health Conditions

According to research conducted by (Zhen-Dong et al., 2020) There are certain conditions that can increase the risk of getting a child infected with COVID-19 more severe, namely:

a. Congenital heart disease

According to research conducted by Feldmann, (2020), entitled A Teenager with Congenital Heart Defect and Covid-19. Available data suggest that children with cardiac comorbidities have a higher chance of developing severe coronavirus disease in 2019. Congenital heart disease is an abnormality that occurs in the structure and function of the heart that is acquired since it was still in the womb. This disorder can occur in the walls of the heart, heart valves, or blood vessels near the heart. As a result, there can be disruption of blood flow in the body, for example, there is a blockage in blood flow, or blood flows into an inappropriate path. Heart defects experienced by children causes the immune system in children to weaken and it will be more difficult to fight infections or viruses that enter. When the Corona virus infects a child's body, the damage to these organs can get worse, so the symptoms caused by COVID-19 that appear can be more severe.

b. Respiratory tract disease (Asthma)

According to research conducted by Rodriguez & Forno, (2020) entitled Asthma and COVID-19 in children, stated that asthma/recurrent wheezing was a potential risk factor for COVID-19 in children. International guidelines have established several respiratory conditions as potential risk factors for severe disease. Chinese guidelines state that children with a history of contact with cases of severe 2019-nCoV infection, or with underlying conditions (such as congenital heart disease, pulmonary hypoplasia, respiratory tract anomalies, with abnormal hemoglobin levels, severe malnutrition), or with deficiency immune or immunocompromised status can be severe if infected with COVID-19.

Coronavirus Disease 2019 (COVID-19) is a respiratory disease caused by a new type of corona virus that has never been previously identified in humans (Mulati, 2020). While asthma is a condition when there is a disturbance in the respiratory system that causes sufferers to experience wheezing (wheezing), shortness of breath, coughing, and tightness in the chest, especially at night or early morning (Azhar, 2018). COVID-19 and asthma are diseases that both attack the respiratory system, so if a child has asthma it will increase in severity if it has been exposed to Covid-19, so children with comorbidities are included in a vulnerable group that needs special monitoring. Because

the immune system of a child with asthma is not as good as a healthy child, the corona virus will easily infect the child.

According to the researcher, from the description above, it can be concluded that the underlying disease conditions/conditions of the disease that have previously been suffered by the child will exacerbate the incidence of COVID-19 in children, so that the symptoms of COVID-19 that appear can also be more severe. Children are vulnerable to the severity of the disease. especially if you have a chronic congenital condition. This is because chronic disease causes the child's immune system to weaken and it will be more difficult to fight infections or viruses that enter. As a result, the body of a child suffering from a previous chronic disease will be more susceptible to disease, including COVID-19 caused by Corona virus infection. In addition, children who have chronic diseases mostly have experienced organ damage. So that when infected with the Corona virus, the damage to these organs can get worse, so that the symptoms that occur due to COVID-19 that appear can be more severe. Chronic disease is a disease with permanent characteristics, causing incapacity for the sufferer, and to cure it the patient needs treatment for a long period of time (Bestari, 2016).

3. Immunity Risk Factors

The ability to protect the body is also reduced, so that pathogens, including viruses, can grow and thrive in the body. Meanwhile, the coordinated reaction of cells, molecules against microbes and other substances is called the immune response(Noya et al., 2019).

The main function of the immune system is as a means of body defense. Defense functions include defense against antigens from outside the body such as invasion of microorganisms and parasites into the body. So that there are two possibilities that occur as a result of the resistance between the two parties, namely the body can be free from adverse effects or vice versa, if the attacker is stronger, the body will experience pain (Suardana, 2017).

The immune system is formed early in life, namely in the womb. The immune system will continue to develop with age. That's why, children seem to get infected or sick more often than teenagers or adults. Because the immune system in children is still learning to recognize and protect the body from germs that enter the body.

Children have the same chance of getting infected with COVID-19 as adults, although they will have milder symptoms or have no symptoms at all (Li et al., 2020). In the author's opinion, there is a relationship between immunity and risk factors for the occurrence of COVID-19 in children, because children are still in the development stage so that the child's immune system is still low and not perfect. In addition, there is no vaccine that can prevent COVID-19, so children are still very at risk of being infected with COVID-19.

Conclusion

The results of the study found:

1. Most children who are confirmed to have COVID-19 get it from their families and children are infected, not infectious. Family exposure is the most dominant factor causing COVID-19 in children.
2. Disease conditions suffered by the child previously such as congenital heart disease, asthma and pneumonia, if infected with COVID-19, will exacerbate the incidence of COVID-19 in children, causing the symptoms caused by COVID-19 to become more severe.

There is a relationship between immunity and the occurrence of COVID-19 in children. This risk factor is a step to prevent COVID-19 in children so that this factor needs to be known by the wider community.

References

- Bialek, S. et al. (2020) 'Coronavirus Disease 2019 in children— United States, February 12–April 2, 2020', *Morbidity and Mortality Weekly Report*, 69(14), pp. 422–426. doi:10.15585/MMWR.MM6914E4.
- Burhan, E. et al., 2020. *Protocols for the Management of COVID-19*. 1st ed.
- Dong, Y. et al. (2020) 'Epidemiology of COVID-19 Among Children in China', *Pediatrics*, 145(6). doi: 10.1542/peds.2020-0702.
- Ernawati, F. (2016) 'The Role of Several Micronutrients in the Immune System', *Indonesian Nutrition*, 36(1), pp. 57–64. doi: 10.36457/gizindo.v36i1.116.
- Feldmann, JO ; MGRK (2020) 'A Teenager with Congenital Heart Defect and Covid-19', *Cardiology in young*, pp. 1–5. doi:10.1017/s1047951120002127.

- IDAI, 2020. Clinical Guidelines for the Management of COVID-19 in Children. 1st ed. Jakarta: Indonesian Pediatrician Association.
- IDAI, 2020. Clinical Guidelines for the Management of COVID-19 in Children. 2nd ed. Jakarta: Indonesian Pediatrician Association.
- Li, W. et al. (2020) 'The characteristics of household transmission of COVID-19', *Clinical infectious diseases : an official publication of the Infectious Diseases Society of America*, (Xx Xxxx), pp. 6–9. doi:10.1093/cid/ciaa450.
- Morand, A. et al. (2020) 'COVID-19 virus and children: What do we know?', *Archives de Pediatrie*, 27(3), pp. 117–118. doi: 10.1016/j.arcped.2020.03.001.
- Mulati, E., 2020. Guidelines for Toddler Health Services During the COVID-19 Emergency Response Period for Health Workers. Jakarta: Ministry of Health.
- Noya, CA et al. (2019) 'The Role of Mothers in Immune System Improvement in Children With Acute Respiratory Infections', *Journal of Nursing*, 11(2), pp. 79–86. doi: 10.32583/nursing.v11i2.422.
- Nur'ain, AAPC (2020) 'The Influence of Social Distancing Policy on the Covid-19 Outbreak Against Vulnerable Groups in Indonesia', 7(1), pp. 34–39.
- Oualha, M. et al. (2020) 'Severe and fatal forms of COVID-19 in children', 27, pp. 235–238. doi: 10.1016/j.arcped.2020.05.010,
- Rodriguez, JA and Forno, E. (2020) 'Asthma and COVID-19 in children: A systematic review and call for data', *Pediatric Pulmonology*, (56), pp. 1–11. doi: 10.1002/ppul.24909.
- Tezer, H. and Bedir Demirdağ, T. (2020) 'Novel coronavirus disease (Covid-19) in children', *Turkish Journal of Medical Sciences*, 50(SI-1), pp. 592–603. doi:10.3906/SAG-2004-174.
- UNICEF (2020) 'COVID-19 And Children in Indonesia', *COVID-19 and Children in Indonesia*, (April). Available at: www.unicef.org.
- Xin, H. et al. (2020) 'Risk factors associated with occurrence of COVID-19 among household persons exposed to patients with confirmed COVID-19 in Qingdao Municipal, China.', *Transboundary and emerging diseases*. doi:10.1111/tbed.13743.
- Yuliana (2020) 'Corona virus diseases (Covid -19); A literature review', *Wellness and healthy magazine*, 2(1), pp. 187–192. Available at: <https://wellness.journalpress.id/wellness/article/view/v1i218wh>.
- Zhen-Dong, Y. et al. (2020) 'Clinical and transmission dynamics characteristics of 406 children with coronavirus disease 2019 in China: A review', *Journal of Infection*. Elsevier Ltd, 81(2), pp. e11–e15. doi: 10.1016/j.jinf.2020.04.030. ed. Jakarta:

Indonesian Pediatrician Association.

- Li, W. et al. (2020) 'The characteristics of household transmission of COVID-19', *Clinical infectious diseases : an official publication of the Infectious Diseases Society of America*, (Xx Xxxx), pp. 6–9. doi:10.1093/cid/ciaa450.
- Morand, A. et al. (2020) 'COVID-19 virus and children: What do we know?', *Archives de Pediatrie*, 27(3), pp. 117–118. doi: 10.1016/j.arcped.2020.03.001.
- Mulati, E., 2020. *Guidelines for Toddler Health Services During the COVID-19 Emergency Response Period for Health Workers*. Jakarta: Ministry of Health.
- Noya, CA et al. (2019) 'The Role of Mothers in Immune System Improvement in Children With Acute Respiratory Infections', *Journal of Nursing*, 11(2), pp. 79–86. doi: 10.32583/nursing.v11i2.422.
- Nur'ain, AAPC (2020) 'The Influence of Social Distancing Policy on the Covid-19 Outbreak Against Vulnerable Groups in Indonesia', 7(1), pp. 34–39.
- Qualha, M. et al. (2020) 'Severe and fatal forms of COVID-19 in children', 27, pp. 235–238. doi: 10.1016/j.arcped.2020.05.010,
- Rodriguez, JA and Forno, E. (2020) 'Asthma and COVID-19 in children: A systematic review and call for data', *Pediatric Pulmonology*, (56), pp. 1–11. doi: 10.1002/ppul.24909.
- Tezer, H. and Bedir Demirdağ, T. (2020) 'Novel coronavirus disease (Covid-19) in children', *Turkish Journal of Medical Sciences*, 50(SI-1), pp. 592–603. doi:10.3906/SAG-2004-174.
- UNICEF (2020) 'COVID-19 And Children in Indonesia', *COVID-19 and Children in Indonesia*, (April). Available at: www.unicef.org.
- Xin, H. et al. (2020) 'Risk factors associated with occurrence of COVID-19 among household persons exposed to patients with confirmed COVID-19 in Qingdao Municipal, China.', *Transboundary and emerging diseases*. doi:10.1111/tbed.13743.
- Yuliana (2020) 'Corona virus diseases (Covid -19); A literature review', *Wellness and healthy magazine*, 2(1), pp. 187–192. Available at: <https://wellness.journalpress.id/wellness/article/view/v1i218wh>.
- Zhen-Dong, Y. et al. (2020) 'Clinical and transmission dynamics characteristics of 406 children with coronavirus disease 2019 in China: A review', *Journal of Infection*. Elsevier Ltd, 81(2), pp. e11–e15. doi: 10.1016/j.jinf.2020.04.030.