

## Analisis Dampak Pandemi COVID-19 terhadap Pelayanan Imunisasi pada Anak

### *Impact Assessment of COVID-19 on Immunization Service for Children*

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#### ABSTRACT

**Background:** Coronavirus Disease 2019 (COVID-19) or the coronavirus disease caused by the SARS-CoV-2 virus has become a concern around the world, especially in Indonesia. As of January 31, 2021, the total cases of COVID-19 infection in the world reached 103 million with 2.22 million cases. The COVID-19 pandemic threatened to have an impact on health progress and particularly on children's development due to the obstruction of immunization services as a national program. **Objective:** This study aims to assess the impact of the COVID-19 pandemic on child immunization services. **Methods:** The method used was a narrative literature review conducted by synthesizing and analyzing 4 search engines including ProQuest, ScienceDirect, Pubmed, and SpringerLink. The search for this manuscript found 22 texts that matched the specified topic, namely the impact of the presence of COVID-19 on immunization services in children, searched for the keywords immunization, COVID-19, immunization service, and child. **Results:** The COVID-19 pandemic has an impact on changes in immunization services for children who have become obstructed, reduced service coverage, perceptions of parents reflecting the high demand for immunization, and an impact on health status, namely by carrying out routine immunizations resulting in trained immunity and generating immunity. **Conclusion:** COVID-19 has a special impact on child immunization services. Immunization services must continue to run and carry out according to applicable standards following local government policies by taking into account the principles and guidelines given. Collaboration between the government, the community, non-governmental organizations, and health professionals are needed to prevent a double burden during the COVID-19 pandemic.

**Keyword:** Child health, COVID-19, Immunization, Service

#### ABSTRAK

**Latar Belakang:** Coronavirus Disease 2019 (COVID-19) atau penyakit virus corona yang disebabkan oleh virus SARS-CoV-2 telah menjadi perhatian di seluruh dunia khususnya di Indonesia. Terhitung total kasus infeksi COVID-19 di dunia per-31 Januari 2021 mencapai 103 juta kasus dengan jumlah kasus meninggal sebanyak 2,22 juta kasus. Pandemi COVID-19 mengancam akan berdampak pada kemajuan kesehatan dan secara khusus pada perkembangan anak dikarenakan terhambatnya pelayanan imunisasi sebagai program nasional. **Tujuan:** Tujuan dari penelitian ini adalah untuk mengkaji dampak pandemi COVID-19 terhadap pelayanan imunisasi anak. **Metode:** Metode yang digunakan adalah narrative literature review dilakukan dengan melakukan sintesis dan analisis pada 4 mesin pencari meliputi ProQuest, ScienceDirect, Pubmed, dan SpringerLink. Pencarian naskah ini menemukan 22 naskah yang sesuai dengan topik yang ditentukan, yaitu dampak dari adanya COVID-19 terhadap pelayanan imunisasi pada anak dicari dengan kata kunci immunization, COVID-19, immunization service, dan child. **Hasil:** Pandemi COVID-19 memberikan dampak terhadap perubahan pelayanan imunisasi pada anak yang menjadi terhambat, cakupan pelayanan yang menjadi berkurang, persepsi orang tua yang mencerminkan tingginya permintaan imunisasi, dan adanya pengaruh terhadap status

kesehatan. **Kesimpulan:** COVID-19 memberikan dampak khusus terhadap pelayanan imunisasi anak. Pelayanan imunisasi harus tetap diupayakan berjalan dan dilaksanakan sesuai standar yang berlaku mengikuti kebijakan pemerintah setempat dengan memperhatikan prinsip dan panduan yang diberikan. Perlu adanya kolaborasi antara pemerintah, masyarakat, organisasi non-pemerintah dan profesional kesehatan untuk mencegah terjadinya beban ganda dimasa pandemi COVID-19.

**Kata Kunci:** Imunisasi, COVID-19, pelayanan, kesehatan anak

## INTRODUCTION

Coronavirus Disease 2019 (COVID-19) caused by the SARS-CoV-2 virus initially occurred in Wuhan, China, and triggering a tremendous epidemic in many cities of China, spreading globally to different countries, including Indonesia. As of January 31st, 2021 the total of COVID-19 infections in the world has reached 103 million cases with 2.22 million deaths. In Indonesia the confirmed positive cases of COVID-19 as of January 31st, 2021 has reached 1.05 million with 29 thousand deaths. The confirmed positive cases in Indonesia were increasing as days were passing (Wu, Chen and Chan, 2020; Ministry of Health Ontario, 2021; Satuan Tugas Penanganan COVID-19, 2021).

Many efforts have been conducted to prevent and reduce the number of morbid cases and deaths caused by COVID-19. In Indonesia, the government has established the Large-Scale Social Restrictions (PSBB) as well as recommendations to do physical distancing. This recommendation has triggered several impacts on important sectors such as the health sector that has been experiencing changes in its work (Ristyawati, 2020). In this pandemic situation, non-emergency health services were restricted as an effort to reduce the risk factors of COVID-19 transmissions, including the immunization service for children (Aritonang *et al.*, 2020; Ranganathan and Khan, 2020).

Immunization was one of the public health essential efforts effective to give specific immunity towards Preventable Diseases with Immunization (PD3I) (World Health Organization, 2020a). The existence of COVID-19 had impacts on the implementation of health programs, particularly the immunization and surveillance services of PD3I.

According to Global Alliances for Vaccines and Immunization (GAVI) data, the World Health Organization (WHO) and United Nations Children's Fund (UNICEF) have mentioned that there were 80 million kids aged below 1 year old with risks of diphtheria, measles, and polio due to the hindrance on the route immunization services in the middle of the COVID-19 pandemics. This was certainly risky for the occurrence of Extraordinary Incident (KLB) of PD3I (Kementerian Kesehatan Republik Indonesia and United Nations Children's Fund, 2020; Nielsen and Bronwer, 2020; United Nations Children's Fund, 2020).

Healthcare facilities like the Community Health Center (Puskesmas) and Integrated Health Post for Child Health (Posyandu) stated that there have been delays or stoppages on the immunization services by 84% during the COVID-19 pandemics. This was caused by parents' worries also healthcare workers' doubts about providing the immunization services in the middle of the COVID-19 pandemics. The same went for the coverage of route immunization to prevent diseases on children such as measles, rubella, and diphtheria, which kept decreasing. For instance, the number of coverage of immunizations for diphtheria, pertussis, tetanus (DPT3), and measles-rubella (MR1) decreased by more than 35% in May 2020 compared to the same period of time in the previous year (Kementerian Kesehatan Republik Indonesia and United Nations Children's Fund, 2020).

To reduce the impacts of COVID-19 on the provision of healthcare services, the Ministry of Health has released a guide, circular letter, and information materials to continue immunization services according to the global guide established by the World Health

Organization (WHO). The guide emphasized the continuation of routine immunizations by staying under the health protocols. This recommendation was in line with research in Africa which found that the health benefits from deaths prevented by keeping routine immunizations on children were more than the risks of excess deaths due to COVID-19 related to clinic visitations, especially for vaccinated children (Abbas *et al.*, 2020).

Health promotion programs became one of the important things in the improvement on achievement and services of immunization for children also optimization on the immunization services for children during COVID-19 pandemics. The health promotion programs should become a solution to problems related to parents' worries as well as healthcare workers' doubts in providing immunization services in the middle of COVID-19 pandemics. The information given by the healthcare workers and community health workers has not resulted in an increase in knowledge and awareness on society regarding the importance of immunizations in the middle of COVID-19 pandemics (Kementerian Kesehatan Republik Indonesia, 2020).

This was parallel with target data of the low coverage of immunizations in 401 districts/cities in Indonesia which was on the number of 80%, and there were only 200 districts/cities that reached the complete basic immunizations by more than 80%. The failure was caused by parents who were afraid and worried about getting the SARS-CoV-2 virus if they visited the health facilities. Also, the parents were not aware of the danger of the diseases that were preventable with immunizations. Other reasons were the ignorance of parents about immunization schedules also incorrect information related to immunizations (Kementerian Kesehatan Republik Indonesia, 2020).

Health promotions should give positive impacts on society, particularly on parents, from knowing to being willing and being able to improve and maintain health, especially in providing immunization for children. Meanwhile, some hindrances stated included the lack of spirit in healthcare workers in implementing health promotion about

the complete basic immunizations on society thus causing the lack of knowledge about the importance of providing immunizations for kids during COVID-19 pandemics. Also, there were no promotion media in the forms of invitations to bring children for immunizations in public places and forms of board media like billboards and so on.

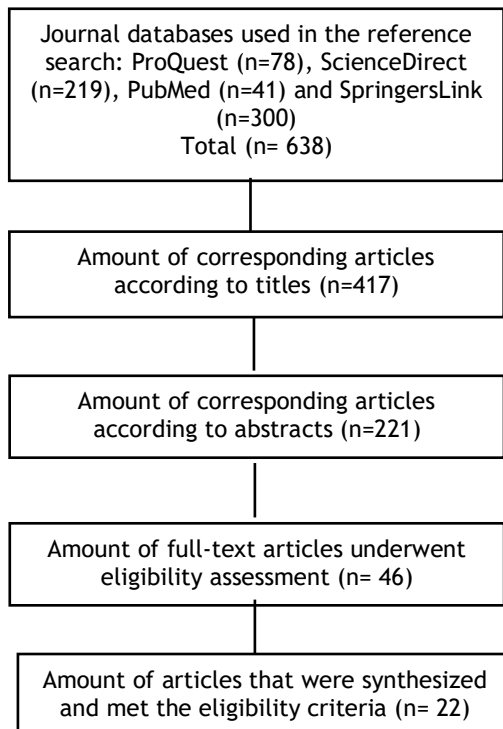
COVID-19 pandemic period should not reduce the spirit in healthcare workers and society to keep doing the important steps regarding immunizations and making sure every child was protected from dangerous diseases that were preventable with immunizations (Johri *et al.*, 2015). Because if such conditions continued to go on, the national coverage of immunization would decrease, hence immunity of communities would also decrease, which could induce risks of PD3I KLB.

PD3I KLB if occurred in COVID-19 pandemics would become a double load for the government, healthcare workers, and the entire society. Based on that background, a study on the impacts of COVID-19 pandemics on the immunization services was necessary to be able to describe changes in the services for children during the COVID-19 period.

## METHOD

Methods in this research were traditional narrative literature reviews which entailed a synthesis from several study results that were published based of the substantial of this writing. An article review with a comprehensive strategy of searching on online databases of research journals using primary sources derived from research results such as journals and articles with reputable journals nationally and internationally with a theme of immunization services for children during the COVID-19 pandemic period. The literature search in this literature review used databases including ProQuest, ScienceDirect, PubMed, and SpringersLink browsed using keywords of COVID-19, Child Health, and Immunization Services. Researcher obtained the access for the literature sources through institutional account owned by the researcher. Data selection and analysis through literature search

was conducted for the publish time of journal from 2020 to 2021 resulted in 638 articles according to the keywords.



**Figure 1.** Research Literature Review Flowchart

Furthermore, this research was supported by secondary data (secondary sources) like the guide books published by the Ministry of Health, WHO, and UNICEF.

## RESULTS AND DISCUSSION

Results of the findings from 22 articles corresponded with the topic identified there were impacts of COVID-19 on the change in immunization services for children. In general, it was found that the change happened during COVID-19 pandemics. This change affected the immunization services and children's health, and there were parents' worries, as well as healthcare workers in conducting the services during the pandemics period.

Knowing one's behavior so they would be willing to do the immunizations for children in a complete manner could be done by analyzing according to the psychology theory approach to explain how health behavior is done by someone. There were several experts that expressed behavior change. Lawrence Green in Notoatmojo (2012) explained the

classification of behavior change into three kinds. First, predisposing factors are factors possessed by individuals, consisted of knowledge, attitudes, beliefs, values, and so on. Second, enabling factors are factors that supported someone to do something in physical form consisted of facilities or infrastructure. Third, reinforcing factors are supporting factors from the outside derived from attitudes and behaviors of reference groups in society.

Apart from Green's theory, there is also one of the specific theories: the Health Belief Model (HBM). Health Belief Model is a psychology theory model that aims to explain how someone has healthy behavior. This theory has a focus on attitudes and beliefs of individuals when doing a behavior. Health Belief Model (HBM) consisted of a few main variables such as perceived susceptibility, perceived severity, perceived benefits, and perceived barriers, cues to action, self-efficacy, and knowledge. For example, perceived susceptibility that is felt will happen when one believes that one is susceptible to health conditions. This is in line with several pieces of research which said that mothers with perceptions and perceived their infants to be susceptible to communicable diseases had a bigger odd to give immunizations to the infants than mothers that perceived their infants to be not susceptible (Utviaputri, 2018).

Perceived severity of a person or individual occurs when the person believes that their condition has serious consequences. In this case, a person will seek treatment and prevention of the disease driven by the seriousness of the disease. Individuals or parents who did not immunize when they were a child, are likely to cause a disease, one of which is a disease that was not previously immunized, so they will seek treatment or are more likely to immunize their children (Utviaputri, 2018).

Perceived benefits of individuals are yet very significant in HBM. By giving immunizations to infants, then there would be a benefit that is protection from communicable diseases that may lead to death. According to research which said that mothers who perceived those immunizations are very beneficial for their infants had a 1.83 bigger probability to give immunizations to their infants than

mothers who perceived those immunizations for infants were not beneficial (Yuningsih, 2020).

Perceived barriers of individuals also cause a negative outcome related to health action. This phase occurs when one believes that the negative effect of an action is bigger than its benefit. Parents who perceive that giving immunizations will negatively affect their infants' health will thus perceive this as a barrier that is unnecessary to be done. Mothers with the perception that there were a lot of barriers when giving immunizations to their infants had a 0.96% smaller possibility to give immunizations to the infants than mothers with the perception that there was no barrier when giving immunization to their infants (Yuningsih, 2020).

Another example is, self-efficacy will happen when one is sure of one's ability to act or change one's behavior. In this matter, either parents or healthcare workers will be in this phase when they realize the benefits of giving complete basic immunizations to infants according to the needs required by the government (Fitria, 2013).

There is a difference in immunization services conducted both before and during the pandemics, particularly when the lockdown policy was decided. Some journals have emphasized the importance of immunizations in this COVID-19 pandemic period. Immunizations became important as it was responsible in diseases that had potentials to be fatal hence immunizations might save millions of lives in the world. In fact, immunizations were estimated to be able to prevent 2-3 million deaths every year caused by diseases such as diphtheria, tetanus, pertussis, flu, and measles (Stefanati *et al.*, 2021).

Furthermore, children can act as a virus carriers that may harm the lives of other individuals. Neonates and infants also can easily get infected by family members without having to be exposed to the outside world. COVID-19 is indeed affecting children in the same manner as other age groups. Hence the best treatments needed to be done while dealing with these children populations one of which is by keep doing the immunizations (Saleem *et al.*, 2020).

**Table 2.** Matrix of Journal Topics of Impacts of COVID-19 Pandemics on Immunization Services for Children

Topics	Methods	Aspects	Results
Coronavirus Disease 2019 (COVID-19) in Children: Vulnerable or Spared? (Saleem, et al 2020)	Systematic Review	Children populations were susceptible to COVID-19 infection	COVID-19 affected children populations. But there were differences in the severity level of the symptoms on COVID-19 infected children. Research had provided data of children having complications who were at risk of dying due to COVID-19.
Promoting and supporting children's health and healthcare during COVID-19 - International Paediatric Association Position Statement (Klein, et al 2020)	Original Research	Recommendations from International Pediatric Association for children's health and healthcare during COVID-19	- All children should be vaccinated according to the usual schedule - Planning of immunizations should cover effective communication strategies and engagements of stakeholders and society
Covid-19 and its impact on immunization programs: reflections from Brazil (Matos, et al 2020)	Original Research	Reflection of immunization programs in Brazil during COVID-19 pandemics	Immunization programs in Brazil faced challenges. For instance, there was a decrease in the coverage level of vaccines which cause a health crisis.
A Review of Recommendations for Routine Immunization Services During COVID-19 Pandemic That are Relevant for Nursing Personnel Involved in the	Literature Review	Recommendations for immunizations services during COVID-19 pandemics for nurse practice	Nurses had an important role in the implementation and promotion of vaccination and emphasize the importance of immunizations for children. Therefore, it was important for nurses to have the newest information about vaccinologist intervention that reduced the

Topics	Methods	Aspects	Results
Implementation of Immunoprophylaxis (Bednarek, et al 2020)			transmission of SARS-CoV-19 infection.
The Impact of the COVID-19 Pandemic on Immunization Campaigns and Programs (Lassi et al, 2020)	Systematic Review	Impacts of COVID-19 on vaccine coverage in the entire world and identify the potential factors that caused that matter.	<ul style="list-style-type: none"> <li>- A decrease in vaccine coverage caused children to lose vaccine doses.</li> <li>- Contributing factors to the low vaccine coverage including fear of getting exposed to the virus in healthcare facilities, movement restrictions in the city, lack of workers, and resource transfer.</li> </ul>
Value of Immunizations during the COVID-19 Emergency (Stefanati, et al 2020)	Report	Disturbances of vaccination services were reported in 68 countries, with the involvement of 80 million kids in the world.	<ul style="list-style-type: none"> <li>- Restoration and Integration of vaccination services were needed for susceptible individuals.</li> <li>- Implementation of adequate steps of monitoring and supervising.</li> <li>- Implementation was hoped for many countries to deal with the global health emergency today particularly the COVID-19 pandemics.</li> </ul>
Childhood vaccinations: Hidden impact of COVID-19 on children in Singapore (Zhong et al, 2020)	Multi-center retrospective cohort study	Decrease in vaccine coverage of children in 3 kinds of healthcare facilities in Singapore: <ul style="list-style-type: none"> <li>- Primary Treatment Clinic</li> <li>- Pediatric Unit of hospitals and private</li> <li>- Children doctor clinic</li> </ul>	Public health effort was highly needed to maintain effective routine vaccine coverage for children during COVID-19 pandemics.
COVID-19 and routine childhood immunization in Africa:Leveraging systems thinking and implementation science to improve immunization system performance (Adamu, et al 2020)	Report Perspective	Immunization System	<p>A concept of system thinking paradigm and the use of implementation science in immunization.</p> <p>System thinking might inform a more holistic understanding of the relation between COVID-19, its control strategies, and immunizations for children.</p>
Impact of COVID-19 pandemic response on uptake of routine immunizations in Sindh, Pakistan (Chandir, et al 2020)	Analysis of provincial electronic immunization registry data	Pandemic Responses during Immunizations	The more children that did not get immunizations during the lockdown, caused them susceptible to diseases that could be prevented with vaccines. There was the need for intervention customized with promoting immunization visits and provision of safe immunization services.
The indirect impact of COVID-19 on child health (Ashikkali, et al 2020)	Report	COVID-19 had impacts on children and teenagers.	<ul style="list-style-type: none"> <li>- Indirectly, this implication should not be neglected.</li> <li>- This explored the physical and psychological effects.</li> <li>- Roles of healthcare workers in offering advice and</li> </ul>

Topics	Methods	Aspects	Results
Potential impact of COVID-19 pandemic on vaccination coverage in Children (Carias, et al 2020)	A case study	Projection of vaccination coverage	<p>practical services were what needed to be paid attention to.</p> <ul style="list-style-type: none"> <li>- Modelling of vaccination coverage of measles in many scenarios gave useful information on how massive the potentials and impacts of the lack of immunization coverage are.</li> <li>- Efforts to fill the continuous gap were needed to ensure that the vaccination coverage would maintain to be high.</li> </ul>
Reflection on lower rates of COVID-19 in children: Does childhood immunizations offer unexpected protection? (Lyu,et al 2020)	Report	Children's immunity sytem	Children's cellular immunity system was different from adults' that might have been the main key to children experiencing mild symptoms compared to the adults.
Routine childhood immunisation during the COVID-19 pandemic in Africa (Abbas K,et al 2020)	A benefit-risk analysis	High impact scenario and low impact scenario to estimate children deaths that could have caused by a decrease in immunization coverage during COVID-19 pandemics.	<ul style="list-style-type: none"> <li>- Deaths prevented by maintaining childhood routine immunizations in Africa were higher than the risk amount of death due to COVID-19 concerning visitation to vaccination clinics, particularly for children that we vaccinated.</li> <li>- Routine programs of immunizations for children should be maintained in Africa also still considered other factors such as logistics problems, lack of staff, and resources reallocations during COVID-19 pandemics.</li> </ul>
COVID-19 and missed routine immunizations: designing for effective catch-up in Canada (MacDonald et al, 2020)	Report	Canada indicated that vaccinations for children had to keep going.	<p>Components that needed to be integrated:</p> <ol style="list-style-type: none"> <li>(1) Identify children who missed vaccines;</li> <li>(2) Detect gaps in the distribution of vaccines.</li> <li>(3) Adapt, adjust, and develop strategies to fill the gaps;</li> <li>(4) Communicate, document, evaluate, and readjust the immunization program.</li> </ol> <p>Everything had to be adjusted with the developing reality.</p>
Infant and child health and healthcare before and after COVID-19 pandemic: will it be the same ever? (El-Shabrawi, et al 2020)	Report	Direct and indirect impacts of COVID-19 pandemics on children.	<ul style="list-style-type: none"> <li>- COVID-19 crisis hugely impacted children's health, not only on medical aspects but also social, psychological, economic, and educational aspects.</li> <li>- All these detrimental implications needed identification and treatment with the individual based approach in short term and</li> </ul>

Topics	Methods	Aspects	Results
The COVID-19 pandemic threatens the Expanded Program on Immunization: recommendations for sustaining vaccination goals (Hamid et al, 2020)	Report	Responses to COVID-19 pandemics	long term. The immune system of children aged <5 was more susceptible to infections than of other age groups.
Immunization During the COVID-19 Pandemic: Recommendations From Indian Academy of Pediatrics Advisory Committee on Vaccines and Immunization Practices (Kasi et al, 2020)	Report	Recommendations of SARS-CoV-2 suspect routine immunizations for children.	Immunizations were thought to be essential health activities that needed to be conducted and sustained as early as possible.

### Coverage of Immunization Services for Children Before and During COVID-19 Pandemics

Out of 22 research manuscripts, there were four research journals that covered the coverage of immunization services for children before and during COVID-19 Pandemics. Results of this research stated that in the United States, vaccination data showed a decrease starting from a week after the national COVID-19 emergency was announced. In Pakistan, a decrease also occurred on the daily average total of vaccination during COVID-19 lockdown (Matos, Barbieri and Couto, 2020). The same thing applied in India that one of every two children in Sindh Province have missed routine vaccinations during COVID-19 lockdown. Children that did not receive immunizations increased during the lockdown, which caused them susceptible to diseases that could be prevented by immunizations (Chandir *et al.*, 2020). And in Singapore, the coverage decreased to 74-84% between children aged 12 months to 2 years old, far below the 95% standard (Zhong *et al.*, 2021).

While before COVID-19 in Indonesia, around 90% of children have received immunizations in public facilities which were 75% Integrated Health Post for Child Health (Posyandu), 10% Community Health Center (Puskesmas), 5% Village Maternity Cottage (Polindes), and 10% clinics and private hospitals. However, during COVID-19 pandemics it was showed that clinics and private hospitals became the main source to get immunization services for children (more than 43%), Puskesmas

(29%), and Posyandu (21%). This happened because there were no provided immunization services, especially at Posyandu and Puskesmas level (Kementerian Kesehatan Republik Indonesia, 2019).

Before there were COVID-19 pandemics, coverage of vaccination increased rapidly in many parts of the world. It was estimated that 90% of children would be vaccinated with Bacillus Calmette-Guerin (BCG), third dose of diphtheria vaccines, tetanus, and pertussis (DTP), oral polio (OPV3), and measles vaccines. However, WHO and UNICEF warned about the decrease in vaccination levels for children during the COVID-19 pandemics (World Health Organization, 2020b). The existence of COVID-19 also hampered the supply chain of drugs and vaccines. Hence, at last, reducing the coverage of immunization. This could place children at risk of diseases that could have been prevented with immunizations along with complications (Hamid *et al.*, 2020).

### Perception of Parents in Giving Immunization Services COVID-19 Pandemics

As many as four research pieces covered perceptions of parents or caretakers during COVID-19 pandemics. Parents and caretakers were worried about the risks of being infected by COVID-19 in healthcare facilities and this became an important consideration. Most parents assumed that immunization services in Integrated Health Post for Child Health or even house visits would be safer compared to immunization services in healthcare facilities. Nearly 82% of parents reported



the need of getting accurate information from the government regarding the provision of safe immunization services. Parents could ensure that the healthcare workers implemented the health protocols which were corresponding to the recommended standard (Kementerian Kesehatan Republik Indonesia and United Nations Children's Fund, 2020).

The importance of immunizations on infants and children could be re-emphasized through organized and conceptualized health promotion that could be done by healthcare workers or community health workers to educate parents so they would be able to motivate parents or caretakers to continue to proceed with the scheduled immunization visits (Adamu *et al.*, 2020; Kementerian Kesehatan Republik Indonesia and United Nations Children's Fund, 2020).

With knowledge, one might do changes so one's behavior might develop. All activities carried out by parents or caregivers regarding the implementation of immunization in children are nothing but the results obtained from knowledge (Rahmawati and Umbul, 2014).

This was in line with Notoatmodjo's theory (2010) which stated that activities in the form of providing health information or messages as well as health counseling aim to increase knowledge and attitudes towards health needed by a person so as to make it easier for someone to initiate healthy behavior which in this case is the perception of parents to immunize children during the COVID-19 pandemic (Notoatmodjo, 2010).

Furthermore, it should be emphasized that the level of knowledge about immunization is a factor with an important role. The public, especially parents, should be given information about the importance of immunization for children during the COVID-19 pandemic so that they would be aware of the implementation of immunizations and would do chase of immunizations if any was missed by their children (Kasi *et al.*, 2020).

It was also needed to share the appropriate prevention and control of infections to parents and caretakers, such as through provision of handwash facility in locations of immunization services. Altogether, this reflected the high demand for immunization where parents and caregivers sought alternative health care

facilities that offered immunization services they felt were safe (Kementerian Kesehatan Republik Indonesia and United Nations Children's Fund, 2020).

### **Impacts of Immunizations on Children's Health during COVID-19 Pandemics**

Out of all literature that was obtained, it was also found journals covered the impacts of immunizations on children's health during COVID-19 pandemics. One of which conducted in Africa in 2020 stated that COVID-19 pandemics allowed several children to be vaccinated and assumed that the children groups who were not vaccinated had a risk of being susceptible to death until the age of 5 (Zhou, 2020). In line with research conducted in India which mentioned that if children were given complete immunizations as scheduled hence would add the dose boosters as well as minimum occurrences of emerging diseases (Hamid *et al.*, 2020).

Although direct impacts of COVID-19 pandemics on children's health were low, however, there were indirect impacts in many aspects (Sidiq *et al.*, 2020). It was needed to be paid attention at that children were the most susceptible group to get respiratory pathogens, but COVID-19 virus did not cause severe cases among them (Velavan, Pollard and Kremsner, 2020). According to a pathology stud of COVID-19, children's cellular immune system was different from adults' which might be the main key. By doing routine and scheduled vaccinations in children would result in trained immunity of innate immune system, also in an occurrence of antibody protection in children (Lyu *et al.*, 2020; Saso, Skirrow and Kampmann, 2020).

### **Changes in Immunization Services for Children during COVID-19 Pandemics**

WHO has released guides to maintain health services which felt to be significant during COVID-19 pandemics, including immunization service as core healthcare services that should be prioritized and maintained during pandemics. WHO advised that massive vaccination campaigns needed to be postponed temporarily and kept following recommendations on physical distancing also ensuring provision of immunizations would not contribute to the COVID-19 transmission. However, the planning and effort to fill the gap of immunizations for

children should be conducted quickly by paying attention to prevention strategies for susceptible populations including children, hence reducing the increase of morbidity and mortality risks of diseases that were prone to cause epidemic (El-Shabrawi and Hassanin, 2020; Klein *et al.*, 2020).

In line with that, research conducted in Amerika suggested that continuous monitoring on routine immunizations was needed to understand the impacts of COVID-19 pandemics. It was also needed an effort to fill the gap in immunizations and innovative strategies necessary to be developed to prevent occurrences of other diseases that would potentially harm lives (Carias *et al.*, 2020).

Research conducted in Canada in 2020 also mentioned that immunizations remained to be valid and provided for infants and children by identifying children who missed immunizations. After that adaptation and adjustment, strategy development in many aspects to fill the gap, also communication, documentation, and evaluation readjusting immunization services according to COVID-19 pandemics (MacDonald *et al.*, 2020).

#### **Recommendations of Immunization Services during COVID-19 Pandemics**

There were 8 literature and research that covered the recommendations related to immunizations during COVID-19 pandemics. Immunization services had to remain being enforced to happen and conducted according to immunization schedules of the valid national programs following the government's policy by adhering to the PPI principles and keeping a safe distance (Kementerian Kesehatan Republik Indonesia, 2020; Minhas *et al.*, 2020).

Based on results of risk mapping analysis, it was obtained that recommendations of immunization services could be a selection of service sites that corresponded with regional conditions (Jain *et al.*, 2021). Healthcare facilities like Community Health Center and Integrated Health Post for Child Health in areas that remained as susceptible could conduct the services with a proactive system. In case the situations did not allow, hence recommendations of immunization postponement, with a recording of healthcare workers and community health workers. After that, a

list of children that have not received immunizations would be obtained to thus be prioritized soon when the opportunity of next immunizations were available (Nadhifa *et al.*, 2020).

During pandemics, it was important to monitor the level of immunization services and analyses the coverage among general populations and certain susceptible groups (Or Caspi, Michael J. Smart, 2020). Providers of immunization services should start to prepare the list of children that have missed vaccine doses and develop action plans for immunization-gap-filling efforts adjusted according to needs.

Based on the experiences obtained during epidemics and emergency health situations previously, support of essential healthcare services such as immunizations became WHO's priority concerns. However, it should be developed that we faced pandemics that have never occurred before. WHO underlined that immunizations were the basic healthcare services and hence should be the priority and be maintained even during COVID-19 pandemics (Jain *et al.*, 2021)

#### **Children Health Promotion Efforts and the Relation with Immunization Services in the Middle of COVID-19 Pandemics**

Indonesian society has various social characteristics, starting from age, education level, economy level, and exposure to internet/mass media, social environment, culture, ethnic groups, hence have different understanding and attitudes towards COVID-19 pandemics. The understanding and attitudes that were formed could affect the action/behavior of society, in this case, parents and healthcare workers and their relation to the provision of immunization services for children (Yuningsih, 2020).

To maintain society's demand for immunization services during COVID-19 pandemics, a promotion strategy should be particularly planned to give accurate health information of children hence answering society's worries, increasing relationships with the society which in the end encouraging the usage of sustainable immunization services. Health promotion conducted needed an active role of community health workers, religious leaders, society leaders, civil society networks, and local security officers. In this case, in particular, parents will be more obedient and trusting in giving

immunizations to their children if all elements of society are always active in urging the implementation of immunizations for children. Society should obtain clear information regarding the continuity of services and be strongly encouraged to continue to carry out scheduled visits while still complying with the recommendations for physical distancing from the local government through maximum health promotion efforts that could be carried out by relevant stakeholders (World Health Organization and United Nations Children's Fund, 2020)

Health workers should also be trained to carry out COVID-19 prevention and control measures concerning the provision of immunization services for children. Immunization visits should also be used as an opportunity to disseminate messages as a health promotion strategy to encourage behaviors that could reduce the risk of transmission of the COVID-19 virus in children, recognize the symptoms and signs of COVID-19 disease, and provide guidance on what to do if symptoms occur so that every child could be protected from dangerous diseases that could be prevented by immunization while also reducing the risk of the possibility of being exposed to the COVID-19 virus, national immunization coverage would slowly be achieved thus it was hoped double burden of the risk of outbreaks of PD3I and COVID-19 in children would be prevented (World Health Organization and United Nations Children's Fund, 2020).

#### Research Limitations

Limitations of this research were that most of the journals and literature that were analyzed originated from foreign countries and in English which could indicate there were cultural differences with Indonesia due to the limited journals that covered the impacts of COVID-19 on immunization coverage in Indonesia, particularly those that reported hindrances or factors affecting perspective disorders of users and providers. In addition, another weakness of this research was there could be a bias during the selection of articles for review which was adjusted with the knowledge or experience of the researcher.

#### CONCLUSION

According to the results of the literature, it was shown that COVID-19 gave an impact on the changes in immunization services for children. The changes occurred namely immunization services were hindered, immunization coverage in children decreased compared to the previous year, also impacts on the health status of children. These were caused by parents' worries to visit healthcare facilities and give immunizations to their children, and the lack of information that society got on the importance of immunizations for children during COVID-19 pandemics. Then, there were hopes from parents to be able to access safe immunizations and accurate information. Therefore, the government, society, non-governmental organizations, and health professionals should work collaboratively to prevent the occurrence of the double burden caused by the non-fulfillment of basic immunization services during COVID-19 pandemics.

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