



JOURNAL OF PUBLIC HEALTH FOR TROPICAL AND COASTAL REGION (JPHTCR)

Journal homepage: <http://ejournal2.undip.ac.id/index.php/jphtcr/index>

ISSN : 2597-4378

Research Article

Immunization Punctuality in The Achievement of Complete Basic Immunization for Babies Age 12-22 Months in Semarang

Ayun Sariatmi^a, Wulan Kusumastuti^b

^aLecturer in Administration and Public Health Policy Dept., Faculty of Public Health, Diponegoro University, Indonesia. Corresponding author. Email : ayunsariatmi@gmail.com

^bLecturer in Administration and Public Health Policy Dept., Faculty of Public Health, Diponegoro University, Indonesia

Abstract

Background : Immunization is an effort that deliberately provides immunity to infants / children to avoid certain diseases. Immunization is important because it affects the growth of infants and children, when administered within the stipulated time period. The facts show that many parents do not immunize on schedule and tend to postpone it. The objectives of the study analyzed the punctuality of complete basic immunization in infants aged 12 to 13 months ("Baduta") in Semarang.

Methods : This research is an observational study with cross sectional design. The population means all Baduta in Semarang, with sample of 689 Baduta from 37 Puskesmas (Society Health Center) taken randomly. Baduta immunization status is obtained from the KIA Book.

Results : The results show 98.25% of Baduta have received basic immunization although not all yet complete. Immunization of measles is the most immunization which have not been received yet by Baduta (13.35%), followed by Polio-4 (8.27%) and DPT / HB / HiB-3 (7.4%). Sources of information on immunization are generally obtained from health workers and cadres.

Conclusion : Immunization HB-0 is given at the most punctual (96.28%), followed by DPT / HB / HiB-3 (90.13%) and Polio-4 (85.44%), while immunization of measles has the lowest punctuality (41.04%), followed by BCG immunization (61.5%).

Keywords : immunization, punctuality, baduta (infants aged 12-23 months)

Article History : Received : 15 January 2019 ; Revised : 14 February 2019 ; Accepted: 5 April 2019

Background

As the next generation, children's health status affects the survival of the nation and state. The 1945 Constitution article 28 B paragraph (2) mandates the rights of every child to survival, growth and development, as well as the right to protection from violence and discrimination. Article 28 H paragraph (1) also states that every person (including children) has the right to live physically and

mentally, live and get a good, healthy environment and is entitled to health services. Law No. 23 of 2002 concerning Child Protection also mandates that every child has the right to obtain health services and social security according to physical, mental, spiritual and social needs. Health services that are intended one of which is immunization, as stated in Law Number 36 of 2009 concerning Health, namely "every child has the right to obtain basic

immunization in accordance with the provisions to prevent the occurrence of diseases that can be avoided through immunization" and the Government is obliged to provide complete immunization to every baby and child. Thus immunization for each child has a very strong legal basis.

Immunization is an effort to provide immunity in infants or children so as to avoid the transmission of certain diseases according to the type of immunization. Basic immunization is immunization given to infants / children so that children get active initial immunity.¹ Immunization protects children against some immunization-preventable diseases (PD3I), such as tuberculosis, diphtheria, tetanus, hepatitis B, pertussis, measles, polio, meningitis, pneumonia as well as one of the most effective prevention of infectious diseases efficient,² the most cost-effective and most widely done to prevent children's deaths.³ Indonesia is the 4th highest country in the world with a number of children who are not vaccinated or whose vaccines are incomplete. The number of children who are not immunized and not fully immunized living in urban poor areas also tends to increase.⁴

The coverage of national basic complete immunization (IDL) in 2010 to 2013 has reached the strategic plan target, but the annual achievement tends to decrease. In 2010 IDL coverage was 93.6% with a strategic target of 80%, in 2011 it reached 93.3% with strategic plan 82 %, in 2012 it reached 86.8% with a strategic plan target of 86%, in 2013 it reached 89.3% with a strategic target of 88%. Nationally, the complete coverage of Indonesia's basic immunization increased from 41.6% (2007) to 59.2% (2013). In 2014, IDL achievements in Indonesia amounted to 86.9% and did not reach the 2014 strategic plan target (90%). Of the 34 provinces, only 9 (nine) provinces or 27.27% managed to reach the target of 90%.⁵ In Central Java, immunization coverage also tends to

decline. In 2013 IDL coverage was 100.7%, in 2014 it dropped to 93.4%. For cases of immunization-preventable diseases (PD3I), it was discovered that in 2013 there were measles outbreaks with 32 cases, a sharp increase in 2014 to 308 cases. While in Semarang City, there were 137 cases of measles (2013), increasing to 219 cases (2014). In tetanus neonatorum (TN) there was 1 case of death in 2014. The KIPI case (the incidence of infection after immunization) in Central Java Province also increased from 2012 to 2014, namely 17, 24, 45 cases with successive deaths from KIPI - according to 6, 5, 5 cases of death⁶. The incidence of KIPI in Central Java is 21.3% (Ministry of Health RI 2015a).

The coverage of DPT + HB3 immunization in Semarang City decreased from 115% (2013) to 99% (2014), while the DPT-HB-HiB immunization coverage also decreased from 121.3% (2013) to 100.3% (2014). For BCG immunization coverage decreased from 218% (2013) to 98% (2014). In 2015, Semarang City was ranked as the sixth lowest in Central Java for HB.0 immunization coverage <7 days.⁶ Generally, assessment of completeness of basic immunization status in infants / children seen from measles immunization coverage, because measles immunization is the last immunization given with the assumption that other immunizations are complete beforehand. The coverage of Semarang City measles immunization in 2014 was 101%, which decreased slightly from 2013 114%.⁷ (DKK Semarang 2016). The city of Semarang was ranked the fifth highest in infant mortality cases from 35 districts / cities in Central Java with 229 deaths in 2015.⁶ Semarang City Toddler Mortality Rate (AKBa) is also ranked fifth with 283 infant mortality cases in 2015. Various efforts have been made to reduce Infant Mortality Rate (IMR) and Underfive Mortality Rate (AKBa), including efforts to reduce morbidity and mortality due to illness which can be prevented by

immunization (PD3I). Data shows that Semarang City reaches 100% for UCI (Universal Coverage of Immunization) coverage, measles immunization coverage is 101%, BCG 97.3%, DPT-HB 99% and polio immunization 99.1%.⁸ The description also indicates that immunization coverage in Semarang City is good enough.

From supervision of BIAS (School Children Immunization Month) in elementary schools in Semarang City, it is known that there are still parents rejecting their children being vaccinated. Vaccine refusal and reluctance is mainly due to the factors of trust, religion, busyness of parents, and mistrust of a number of parents at the free health facilities provided by the government in immunization services. There is also a stigma in the community regarding the side effects of immunization which are the basis for this rejection and other sociological factors.⁹ In addition to the problem of rejection of immunization, many other problems that occur are the inaccuracies of immunization that also occur in almost all districts / cities in Indonesia, including the city of Semarang. The same condition also occurred in several regions, where the timeliness of measles immunization in infants in the Pasir Kaliki area of Bandung was only 60.47%.¹⁰ Whereas in Pasuruan, 62.5% of babies were not on time to receive DPT Combo and Measles immunizations.¹¹

Interviews with several health cadres showed that although many children had received complete basic immunizations, it was found that the timing of immunization based on the type and sequence of vaccines given were many that did not comply with the provisions or were late from the specified time. Clinically the delays that occur during the maximum timeframe do not provide special effects, but if they occur continuously it will have consequences on the performance of the vaccine.

Based on the Health Profile of Semarang City in 2015, there were 26,388 children targeted for babies, with babies immunized by DPT-HB3 in 2015 amounting to 26,252 (99.5%), only slightly increased compared to 2014, which was 26,171 (99%). Measles immunization coverage was 26,778 (101.79%) slightly increased from 2014 which was 26,721 (101.26%), although still lower than 2013 coverage of 116.5%. In general, immunization service coverage has met the minimum target of 90%.⁸

Although in coverage, the complete basic immunization target (IDL) has been fulfilled, but it is not yet known and identified whether the baby is given immunization according to the time set (timeliness). The city of Semarang as a dynamic city with high community mobilization so that there is a big possibility of time delays in immunization due to busyness and other reasons. While on the other hand it turns out that the delay in giving immunization affects the performance of the vaccine to be not optimal. Babies who are late immunized usually get less vaccines than they should get, because generally a combined dose of vaccine may be slightly different from what is recommended. Only 40.7% of children in Medan have complete basic immunization status.¹² Only 57.1% of infants who received complete basic immunization at the Lubuk Buaya City Health Center in Padang.¹³ The results of Ritonga et al's research in Simalungun District showed that only 65.4% of mothers were compliant in providing complete basic immunization to their babies.¹⁴ The same condition also occurs in several other developing countries, such as Pakistan where 66% of children do not get complete immunization.¹⁵

Method

An observational descriptive study with cross sectional design. The population is all Baduta (aged 12-23 months) in the city of Semarang, with a sample of 689 million obtained from 37 health centers in the city of Semarang. Sampling of Baduta was done by accidental through a survey on 1 (one) selected village per health center, with a minimum number of 11 children and a maximum of 20 children per district. Quantitative data collection related to the timeliness of immunization (the time schedule for immunization) received by Baduta is based on the MCH Handbook (KMS) that the mother has since pregnancy. Collecting data on sources of knowledge about immunization was obtained through interviews with mothers of poor mothers. Data were analyzed descriptively to see immunization timeliness based on each type of immunization.

Determination of criteria for timeliness of basic immunization for children under five years of age is based on the age period of infants / children when receiving immunizations compared to the period of birth, referring to the provisions in the infant immunization guidelines, namely: HB-0 immunization is given to infants aged 0-7 days; BCG immunization is given to infants aged 2-3 months; 3 times DPT / HB / HiB immunization or Penta-3

given to 4 month old infants; Polio immunization 4 times given to infants who are 4 months old; and Measles Immunization given to 9 months old children. With these provisions, then for each baby based on age and months of administration given types of immunization: Age 0-7 days gets HB-0 immunization; 1 month old get BCG and Polio-1 immunization; 2 months old get DPT / HB / HiB-1 and Polio 2 immunizations; 3 months old get DPT / HB / HiB-2 and Polio-3 immunizations; 4 months old get DPT / HB / HiB-3 and Polio-4 immunization; and 9 months old getting measles immunization.

Research result

The results showed that the average age of children was 17.36 months, with a minimum age of 3 months and a maximum of 25 months. Most of the age of poor children were in the age range of 15 <18 months (24.82%), followed by the age of 18- <21 months (23.37%) and aged 12 <15 months (22.64%). Baduta male is slightly more than female (56.7%). Almost all of the million people lived with biological parents, although there were a few Baduta who were found living with their grandmother and brother / mother because both parents worked and lived outside the city and / or abroad.

Table 1. Overview of Baduta Immunization Status Based on Types of Immunization Received by Baduta in Semarang City

Immunization Type	Immunization Status				Amount
	YES	%	NO	%	
HB 0 (1x)	645	93,61	44	6,39	689
BCG (1x)	652	94,63	37	5,37	689
Penta 3 (DPT/HB/HiB 3x)	638	92,60	51	7,40	689
Polio 4 (Polio 4x)	632	91,73	57	8,27	689
Measles (1)	597	86,65	92	13,35	689

Source : Primary Data, 2017

The data in Table 1 shows that out of 689 respondents who were respondents, BCG immunization was the most received

immunization (94.63%), followed by HB-0 93.61%. Baduta who received Penta-3 immunization (DPT / HB / HiB-3) was

92.60% and Polio-4 immunization was 91.73%. Measles immunization has been received by 86.65% Baduta. Overall there are 98.25% of million people who have received basic immunization packages, but not yet complete. Measles immunization is the most immunization that has not yet been received by Baduta (13.35%), followed by Polio-4 (8.27%) and Penta-3 or DPT / HB / HiB-3 (7.4%). In accordance with the provisions, Penta-3 immunization (DPT / HB / HiB-3) and Polio-4 must be given to infants who are 4 months old. There is a tendency for the higher percentage of poor people who have not received advanced immunization because immunization must be done in stages and sequentially based on age and if immunization has not been given then the person is not allowed to receive

further immunization. Table 2 provides information about the timeliness of immunization for children under five years (12-23 months), where HB-0 immunization is the highest type of immunization (96.28%) compared to other types of immunization, followed by Penta-3 (90.13%) and Polio-4 (85.44%), while measles immunization is the lowest immunization percentage of timeliness is 41.04%, followed by BCG immunization (61.5%). Some of the mother's reasons for the timing of the immunization were mainly due to sick children (heat, flu, cough), she forgot the time schedule and there were no families who could take their children to health facilities so they had to wait for loose time for other family members to deliver.

Table 2. Overview of Timeliness of Immunization Based on Types of Immunization Received by Baduta in Semarang City

Immunization Type	Immunization Punctuality				Amount
	YES	%	NO	%	
HB 0 (1x)	621	96,28	24	3,72	645
BCG (1x)	401	61,50	251	38,50	652
Penta 3 (DPT/HB/HiB 3x)	575	90,13	63	9,87	638
Polio 4 (Polio 4x)	540	85,44	92	14,56	632
Measles (1)	245	41,04	352	56,96	597

Sumber : Data Primer, 2017

As many as 95% of Baduta mothers know about immunization and its benefits. Information on infant immunization was obtained by mothers from various sources, especially from health workers (health center midwives), namely 82.7% followed by health cadres (55.4%) and friends (14.5%). In addition, mothers who also received information and knowledge about immunization from the media (TV / radio / newspapers) amounted to 28.6%, from leaflets / banners / posters only 8.7% and from schools (6.1%), religious leaders (0.5%), and other sources as much as 3.5% based on MCH Handbook.

Discussion

The immunization program is carried out with the aim of reducing morbidity, mortality and disability in infants and children. In accordance with Government regulations, ideally the baby must get complete basic immunization (IDL) consisting of BCG 1 time, DPT 3 times, Polio 4 times, HB / HiB 3 times and measles 1 time. Furthermore, to assess the completeness of basic immunization for babies, seen from the coverage of DPT3 + HB / HiB3, Polio-4 immunization and Measles should be $\geq 80\%$ (target). The central government and regional governments are responsible for organizing this program immunization.¹⁶

Immunization must be provided by health workers at the nearest health facility. Complete basic immunization (IDL) is a package of national health programs for infants and children established by the Ministry of Health and given free to every Indonesian child. The immunization program runs effectively and has an impact on reducing the incidence of disease if the completeness of immunization has been carried out and the quality of immunization services is implemented according to standards. Immunization must be given or received by the baby according to the time and age that has been determined (on time).

The results showed that the average percentage of timeliness of immunization was 74.8% with a range of 41.04% - 96.28%, where the lowest measles immunization was (41.04%), followed by BCG (61.5%). These results indicate that there is a tendency for non-compliance with the time schedule for immunization as stipulated. This result is the same as the one in Yogyakarta which showed 69% of children who received polio immunization on time,¹⁷ in Enrekang District only 66.7% obeyed basic immunization,¹⁸ compliance when measles immunization was only 60.47% in Bandung,¹⁰ and even in Pasuruan, the timeliness of DPT Combo and measles immunizations was only 37.5%¹¹ The immunization schedule is designed for vaccine delivery efforts that are adjusted to the effectiveness of the vaccine and the child's immune response, so that immunization according to the schedule will produce optimal results. Therefore giving immunizations according to the schedule must be obeyed.

Basic immunization for babies is declared complete when the child receives a service package for each type of immunization according to the provisions of the baby's age, time and schedule. The performance of immunizations or vaccines becomes less effective when the child is late to get the immunization (not on time).

Theoretically it is known that if the time lag or time interval for giving a vaccine to a repeat vaccine is far enough, then the body's ability to recognize a virus or bacteria becomes longer which of course also affects the body's ability to develop antibodies. In addition, the timing of vaccine administration also needs to be determined so that every baby / child has maximum protection. Antibodies that babies have at birth that are expected to provide natural protection can interfere with vaccine performance if given at the wrong time (not according to schedule or age). By following the recommended immunization schedule, it is expected to provide certainty and assurance that children receive maximum protection that can be achieved, while obtaining their rights to live a healthy life.

At present Indonesia faces a double burden of health problems, namely the still high incidence of infectious diseases, which are also followed by increasing degenerative diseases.⁵ This condition is also experienced by almost all developing countries, such as Pakistan,¹⁹ India,²⁰ Bangladesh,²¹ and other developing countries.²² Efforts to eradicate infectious diseases are very difficult because their distribution does not recognize administrative boundaries. Therefore, immunization is the most appropriate strategy for preventing the spread of the disease and it is proven to be very cost effective.²³ In other words, immunization is expected to break the chain of transmission.

The results showed the mean percentage of completeness of basic immunization (IDL) reached 91.84% and exceeded the target of 90%, except for measles immunization which had to be improved, because the new achievement was 86.65%. This study is similar to the research of Sutomo et al in Yogyakarta, where as many as 89% of children have received complete basic immunization¹⁷. However, this result is different from the

research in Lubuk Buaya Padang health center, because only 57.1%, respondents gave complete basic immunization¹³ and research at Adam Malik Hospital Medan because only 40.7% of babies had basic immunization status complete¹².

Although immunization is a cost effective prevention strategy for infectious diseases, several studies have shown that children still need additional immunization as their immune booster. The DPT-HB-Hib vaccine is proven to be safe and has high efficacy, and a protective level of immunity will form in infants who have received three doses of DPT-HB-Hib or Penta-3 immunization. Although proven effective in protecting death from the risk of diphtheria, overall the effectiveness of the Penta-3 dose only protects the symptoms of the disease in the range of 70-90%.¹ For this reason, every child must also receive advanced immunizations, namely repeat immunization given to children with the aim of maintaining the level of immunity or to prolong the period of protection, namely DPT / HB / HiB and Measles in children aged <3 years, and DT immunization (Diphtheria Tetanus), measles and TD (Tetanus diphtheria) through the BIAS program (School Children Immunization Month). The purpose of this repeat vaccine is to ensure the level of immunity in children and so on.²³

One of the diseases that also requires further immunization at the age of five years is measles. Measles is a disease that is very contagious and causes severe complications. The measles vaccine has an efficacy of around 85%, so there are still children who do not have immunity and are vulnerable to measles. Herd immunity or group immunity, namely a situation where most of the community is protected / immune to certain diseases so that it causes indirect effects (indirect effects) which is also protected by groups of people who are not targets of immunization or immunization recipients¹. Provision of advanced immunization for DPT / HB / HiB

and Measles in children can be given in the age range of 18-24 months (source). Baduta who has complete basic immunization and received advanced immunization for DPT / HB / HiB and Measles is declared to have T3 immunization status.

Theoretically it is known that knowledge factors play an important role in maintaining and maintaining the health status of the self and family, especially the knowledge of the mother, including the knowledge of the completeness of the basic immunization status of infants and children. It is proven that mother's knowledge is related to complete basic immunization for babies in the Lubuk Buaya health center in Padang city¹³. There is a correlation between the level of knowledge and the timeliness of mothers giving measles immunization to their children at the Pasir Kaliki Bandung health center⁴. Maternal education and knowledge is also related to the accuracy of DPT Combo and Measles immunizations in Pasuruan¹¹. Similar results were also found in various studies in other countries, such as in Arbegona Ethiopia that the gap in the level of knowledge about the benefits of immunization and negative perceptions of mothers about the side effects of immunization into determinants of incompleteness of immunization given to children¹³. In the case of Pakistan, the opportunity for incompleteness of immunization was greater in children whose mothers were less educated, who did not have access to information and mothers who did not use antenatal care¹⁵. This is understood because information comes from knowledge and education, and through ANC services, every pregnant woman is given an explanation related to all aspects concerning the health of pregnant women, newborns and infant / child health, including immunization. Mother's knowledge influences acceptance and rejection of various health efforts for families, especially their children. This is evident in research in Athens Greece, where

increasing household size and maternal education levels are negatively associated with acceptance of all types of new vaccines that are suggested²⁴.

The factors of service, knowledge and attitudes of parents are the most important factors related to the low coverage of immunization in children in developing countries, while family characteristics factors play a role more as risk factors than as factors of influence or predictors⁹. It was further explained that although many studies show that there is a strong influence from good parental understanding of vaccine-preventable diseases, how vaccines work and vaccine delivery schedules, with good immunization status, on the other hand many studies also prove many families with high immunization status from families with a lack of understanding of vaccination. This indicates that scientific technical knowledge about immunization in the elderly is not an essential factor. The positive attitude of parents and the belief that vaccines are good for children's health and able to prevent illness, as well as practical knowledge about services which are essential factors⁹.

Knowledge as a result of human sensing or the results of one's knowledge of the object is strongly influenced by the intensity and attention to the object²⁵. Thus knowledge becomes the first step in the occurrence of individual practices or behaviors, including health behavior, namely the behavior of mothers to immunize their children in a complete and timely manner. One source of maternal knowledge is education²⁶, which can be obtained through continuous socialization and IEC (communication, information and education) activities on complete basic immunization in infants and children. These activities can be carried out by health workers at health centers and regional health cadres to mothers and families, because the results of the study indicate that

the most information about immunization is received by mothers in Semarang City from health workers (82.7%) and cadres (55.4%). In addition health promotion of the benefits of complete basic immunization for children to mothers and their families by the health center and local health cadres must be further enhanced through regular invitations and home visits, as stated by Favin et al (2012) that repeat visits can be made to find out the condition of the child and protects through information when and where the child obtains service⁹. Further explained by Notoatmodjo (2012) that health promotion is a planned effort to influence others to do what is expected²⁷, which is to provide basic immunization in a complete and timely manner for all infants / children to be protected from the risk of contracting diseases harmful to his health.

Conclusion

Even though 98.25% of children with Baduta have received basic immunizations but not all of them are complete. Measles immunization is the most immunization that has not been received by Baduta (13.35%), followed by Polio-4 (8.27%) and DPT / HB / HiB-3 (7.4%). The most timely immunization given was HB-0 immunization, which was 96.28%, followed by DPT / HB / HiB-3 (90.13%) and Polio-4 (85.44%), while measles immunization and BCG immunization were immunizations the lowest timeliness (41.04% and 61.5%). Support and participation of health workers (including cadres) in providing information and understanding of immunization to pregnant women is very important because it is proven that they are the source of information and knowledge of mothers in Semarang City. Support is carried out routinely by informing the immunization schedule at the Health Centers or Integrated Health Service Center (Posyandu), inviting attendees, reminding them to bring and reading the MCH Handbook, and routinely

involving families in the dissemination of the immunization program so that the target of immunization coverage is achieved through the collaboration of health workers (in Health Center) with the community, including collaboration with community leaders and local government officials for their support in the immunization program through the principle of empowerment.

Acknowledgement

Thank you to the Faculty of Public Health for facilitating the funding of this research through the allocation of the 2017 FKM Undip DIPA Fund.

Ethical Consent

This study has met ethical standards with the approval of the Ethics Commission for Health Research, Faculty of Public Health, Diponegoro University Number 222 / EC / FKM / 2017.

References

1. Kemenkes RI. Mengenal Herd Immunity dalam Imunisasi. 2017. p.217. Available at: <http://www.depkes.go.id/pdf.php?id=1704260003>.
2. Proverawati A, Andhini CSDA. Imunisasi dan Vaksinasi Cet 2. Jakarta: Nuha Medika; 2010.
3. Negussie A, et al. Factors Associated With Incomplete Childhood Immunization in Arbegona District, Southern Ethiopia: A case - Control Study. BMC Public Health; 2016. p.1–9.
4. UNICEF Indonesia, Laporan Tahunan Indonesia 2015; 2015. Available at: https://www.unicef.org/indonesia/id/Laporan_Tahunan_UNICEF_Indonesia_2015.pdf.
5. Kemenkes RI. Rencana Strategis Kementerian Kesehatan; 2015-2019
6. Dinkesprov Jateng. Buku Saku Kesehatan Jawa Tengah Triwulan 3; 2015. p.1–162. Available at: www.dinkesjatengprov.go.id.
7. DKK Semarang. Profil Kesehatan Kota Semarang; 2016.
8. DKK Semarang. Profil Kesehatan Kota Semarang, Dinas Kesehatan Kota Semarang; 2015. Available at: http://www.depkes.go.id/resources/download/profil/PROFIL_KAB_KOTA_2015/3374_Jateng_Kota_Semarang_2015.pdf.
9. Favini M, et al. Why Children Are Not vVaccinated: A review of The Grey Literature. International Health; 2012, p.229–238. Available at: <http://dx.doi.org/10.1016/j.inhe.2012.07.004>.
10. Supriatin E. Hubungan Pengetahuan Dan Dukungan Keluarga Dengan Ketepatan Waktu Pemberian Imunisasi Campak Di Pasir Kaliki Bandung; 2015. p.1–10.
11. Irawati D. Faktor Karakteristik Ibu Yang Karakteristik Ibu Yang Berhubungan Dengan Ketepatan Imunisasi DPT Combo dan Campak di Pasuruan. Jurnal Ilmiah Kesehatan Politeknik Kesehatan Majapahit; 2011. p.10.
12. Tanjung ICD, Rohmawati L, Sofyani, S. Cakupan Imunisasi Dasar Lengkap dan Faktor Yang Mempengaruhinya. Sari Pediatri; 2017. p.86–90. Available at: <https://doaj.org/article/abd58ff33d454b66a73be276b07aade3>.
13. Dewi AP, Darwin E, Edison. Hubungan Tingkat Pengetahuan Ibu dengan Pemberian Imunisasi Dasar Lengkap pada Bayi di Kelurahan Parupuk Tabing Wilayah Kerja Puskesmas Lubuk Buaya Kota Padang. Jurnal Kesehatan Andalas; 2013.p.114–118.
14. Ritonga MRS, Syarifah, Tukiman. Hubungan antara Dukungan Keluarga terhadap Kepatuhan Ibu Melaksanakan Imunisasi Dasar pada Anak di Desa Tigabolon Kecamatan
15. Bugvi AS, et al. Factors Associated with Non-utilization of Child Immunization in Pakistan: Evidence from the Demographic and Health Survey. BMC Public Health; 2006-07. p.1–7.
16. Kemenkes RI. PerMenkes No.12 Tahun 2017 tentang Penyelenggaraan Imunisasi.
17. Sutomo R, et al. The Impact of Inactivated Polio Vaccine Introduction on the Overall Expanded Program on Immunization Coverage and Timeliness in Yogyakarta Province. Jurnal Manajemen Pelayanan Kesehatan; 2012. p.64–70.
18. Kadir L, Fatimah, Hadia H. Pengetahuan dan Kepatuhan Ibu pada Pemberian Imunisasi Dasar Bagi Bayi. Stikes Nani Hasanuddin Makassar; 2014. p.9–13.
19. Naseem S. et al. Prevalence of Non-Communicable Diseases and Their Risk Factors at A Semiurban Community, Pakistan. Pan African Medical Journal; 2016. p.1–8
20. Yadav S, Arokiasamy P. Understanding Epidemiological Transition in India. Global Health Action; 2014, 7(SUPP.1).
21. Mahmood SAI, Ali S, Islam R. Shifting From Infectious Diseases to Non-Communicable Diseases: A Double Burden of Diseases in Bangladesh. Journal of Public Health and Epidemiology; 2013. p.424–434. Available at: <http://academicjournals.org/journal/JPHE/article-abstract/67582D040446>.
22. Robinson HM, Hort K. Non-Communicable

- Diseases and Health Systems Reform in Low-and-Middle-Income Countries. *Journal of Community Health and Clinical Medicine for the Pacific*; 2012. p.179–190.
23. Kemenkes RI. Situasi Imunisasi Di Indonesia. Pusat Data dan Informasi Kementerian Kesehatan RI; 2016 p.1–11. Available at: <http://www.depkes.go.id/resources/download/pusdatin/infodatin/InfoDatin-Imunisasi-2016.pdf>.
 24. Pavlopoulou ID, et al. Immunization Coverage and Predictive Factors for Complete and Age-Appropriate Vaccination Among Preschoolers in Athens, Greece: A cross- Sectional study. *BMC Public Health*; 2013. p.1–10.
 25. Notoatmodjo S. Promosi Kesehatan; Teori dan Aplikasi 1st ed. Jakarta: Rineka Cipta; 2005.
 26. Rahman M, Obaida Nasrin S. Factors Affecting Acceptance of Complete Immunization Coverage of Children Under Five Years in Rural Bangladesh. *Salud Pública de México*; 2010. p.134–140. Available at: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0036-36342010000200005&lng=en&nrm=iso&tlng=en.
 27. Notoatmodjo S. Promosi Kesehatan dan Perilaku Kesehatan. Jakarta: Rineka Cipta; 2012.