Public health implications of the relationship between socioeconomic and cultural dimensions on immunization coverage in Bangkalan, East Java

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Abstract. Compared to the statewide average of 91.7%, Bangkalan District had the lowest basic vaccination coverage in East Java in 2022, at just 64.7%. Misconceptions regarding vaccinations are the cause of this poor coverage, which raises the risk of morbidity and death. According to WHO, 1.5 million children die each year from illnesses that may be prevented because they were not vaccinated, underscoring the wider impact on public health. The socioeconomic and cultural elements influencing parents' choices to vaccinate their children in Bangkalan were examined in this study. 87 mothers of toddlers older than two years from the Blega Health Center were chosen by simple random sampling as part of a cross-sectional study. Data were gathered using questionnaires and interviews, and SPSS 23 was used for both univariate and bivariate analysis. The findings indicated that family culture did not significantly correlate with vaccine coverage (p-value = 0.218), while socioeconomic position and immunization coverage did (p-value = 0.001). The low vaccination rates are mostly influenced by socioeconomic considerations, which emphasizes the need for increased accessibility and awareness. It is advised to implement tactics like expanding the hours of health facilities and providing vaccination services in accessible areas. In Bangkalan, increasing vaccination coverage and lowering avoidable child fatalities depend heavily on economic assistance and education.

1 Introduction

Immunization is one of several attempts to improve health and global development that has been shown to save millions of lives yearly [1]. Immunization works by administering a vaccine containing a virus or microbe that has been destroyed or weakened so that the body can produce antibodies to avoid specific diseases [2]. In 2021, the World Health Organization

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(WHO) stated that up to 18.1 million youngsters remained unvaccinated. In Indonesia, the number of children who have received immunizations has increased from 84% in 2019 to 94.9% in 2023 [3]. This increase also occurred in East Java Province where in 2021 it only reached 91.77% then in 2022 it rose to 95%. According to the East Java Provincial Health Office, numerous cities and districts are still below the norm, including Bangkalan Regency, which has a percentage of 64.7% in 2022 [4].

Various reasons might contribute to children's lack of baseline vaccination coverage. These include predisposing, enabling, and reinforcing variables. Individual traits, including age, education, socioeconomic status, money, and culture, can all be predisposing factors. Infrastructure, personal needs, and the ease of access to immunization programs are all enabling factors. Meanwhile, the role of health workers, family support, and environmental factors all impact parents' decision to immunize their children. According to the East Java Provincial Health Office, predisposing factors are the primary cause of low basic vaccination coverage in 2022. The community rejects kid immunization because it is not understood correctly [5]. In this context, a misunderstanding or lack of knowledge about the importance of childhood immunization can be a major obstacle in providing proper and complete immunization. As part of predisposing factors, misconceptions about childhood immunization can affect parents' motivation, attitudes and perceptions towards immunization, resulting in low coverage of basic immunization in Bangkalan District.

If basic immunization is not given in full, it can cause outbreaks and increase disability and death rates [6]. This is supported by WHO data which as many as 1.5 million children each year die from diseases that can actually be prevented by immunization, such as diphtheria, tetanus, polio, and measles, the problem of low basic immunization coverage is becoming increasingly evident and has a major impact on children's health. This condition not only opens up opportunities for infectious disease outbreaks, but also has the potential to increase the rate of permanent disability and death among children [7]. Seeing the dangers posed and the incomplete provision of basic immunization is a problem that must be resolved immediately, a problem formulation is created regarding the relationship between risk factors that cause incomplete basic immunization such as socio-economics and culture in families in Bangkalan Regency. A study suggests that families with higher income or socio-economic conditions will have the opportunity to have a healthier body by 2.44 percent because families with higher socio-economic conditions tend to allocate their income to the health sector [8]. As well as in other findings, it shows that the culture that exists in the family can affect immunization provision, where mothers who are in a weak culture will show a good attitude in immunizing their children, but if they have a history of high education it can change someone for the better [9]. A study suggests that families with higher income or socio-economic conditions will have the opportunity to have a healthier body by 2.44 percent because families with higher socio-economic conditions tend to allocate their income to the health sector [8]. As well as in other findings, it shows that the culture that exists in the family can affect immunization provision, where mothers who are in a weak culture will show a good attitude in immunizing their children, but if they have a history of high education it can change someone for the better [9]. Given these two opinions, this paper aims to investigate the socioeconomic and cultural dimensions of the family that potentially influence the coverage of basic childhood immunization in Bangkalan District, East Java. On the other hand, there is still a lack of research that directly addresses the issue of how socio-economic and cultural factors in the family can affect the completeness of a child's basic immunization so it is necessary to conduct research to prove that these factors can affect the provision of basic immunization and reduce health problems. Thus, this study aims to fill the knowledge gap and provide a deeper understanding of the relationship between socio-economic and cultural dimensions in the family and children's basic immunization coverage, so that it can contribute to efforts to improve child and family health in Bangkalan District, East Java.

2 Method

This study utilized a correlational analytic research design using a cross-sectional methodology. This study investigates the relationship between socioeconomic and cultural characteristics and child basic vaccination coverage. The study's population consisted of all moms with children above the age of two who worked at Blega Health Center in Bangkalan Regency, Madura. The sample was determined using a probability sampling technique in the form of simple random sampling with the Slovin formula and a 10% error rate. According to Amin (2023) simple random sampling is a strategy for randomly selecting sample members from a population, regardless of strata [10]. So that a total of 87 respondents were obtained who met the research sample criteria from a total of 380 populations.

Data collection in this study has requested respondents' consent so that it can be conducted through interviews utilizing instruments in the form of questionnaires with closed questions for features of socioeconomic characteristics and family culture variables. The basic vaccination coverage variable employs a checklist sheet that includes 18 types of basic immunizations that must be administered to children aged 0-12 months according to the Ministry of Health of the Republic of Indonesia's guidelines. After collecting the data, each variable is scored separately. A normality test was performed on the scoring results, which revealed that the data was not normal, prompting an investigation using the Spearman Rank non-parametric correlation test. The data was then converted to an ordinal scale by ranking each variable. It was done to execute the Spearman rank test with at least an ordinal scale, allowing the research object to be ranked in two successive series. The rankings are then used to categorize each variable. The varying number of basic vaccinations was classified into three categories: low (5-9), medium (10-12), and high (13-18). Socioeconomic variables are divided into three categories: low (9-11), middle (12-15), and high (16-19). Meanwhile, cultural variables are divided into two categories: supporting (2-4) and not supporting (5-8). Furthermore, the data can be examined univariately and bivariately with IBM SPSS 23. Univariate analysis is performed on each variable to describe each existing variable. In bivariate analysis, Spearman rank correlation was used to examine the relationship between socioeconomic characteristics and basic immunization coverage variables, as well as family culture and basic immunization coverage variables.

3 Result and Discussion

3.1 Characteristics of Respondents

The characteristics of mothers and toddlers are presented in the form of frequency distribution and percentages in Table 1. Based on the data in Table 1, it can be seen that most mothers have an age range of 25-35 years, with 56 respondents (64.4%), while the lowest age group is ≥36 years old with 15 respondents (17.2%). Meanwhile, the majority of respondents' children were 2 years old with 34 (39.1%) and the fewest were 5 years old with 7 respondents (8%). Child gender demographics showed that males dominated with 45 respondents (51.7%), while females accounted for 42 respondents (48.3%).

Table 1. Respondent Characteristics

Respondents Characteristics	Frequency (F)	Percentage (%)
Mother's Age		
≤24 years	16	18.4
25-35 years	56	64.4
≥36 years	15	17.2
Total	**87**	**100.0**
Child's Age		
2 years	34	39.1
3 years	25	28.7
4 years	21	24.1
5 years	7	8.0
Total	**87**	**100.0**
Child's Gender		
Male	45	51.7
Female	42	48.3
Total	**87**	**100.0**

3.2 Immunization Status of Toddlers

An overview of the immunization status of respondents in the Blega Puskesmas working area is shown in table 2.

Table 2. Immunization Status of Toddlers

Total of Immunization	Frequency (F)	Percentage (%)
High	8	9.2
Moderate	73	83.9
Low	6	6.9
Total	**87**	**100.0**

Based on table 2, it is known that most respondents, namely 73 toddlers (83.9%) have a moderate amount of basic immunization, while there are only 6 toddlers (6.9%) with a low number of immunizations. When associated with the Health Belief Model theory, a person's behavior is determined by individual motives and beliefs. The Health Belief Model is a model used to describe individual beliefs about healthy living behavior, so that individuals will carry out healthy behavior in the form of preventive behavior and use of health facilities [11].

Becker's Health Belief Model theory explains that people will not use medical health services if they do not have relevant knowledge and motivation about health [12]. This is influenced by individual perceptions of the threat of disease and beliefs about the value of health benefits and actions. When individuals act to fight or treat their disease, there are four key variables involved in the action, namely the perceived susceptibility to a disease, the perceived seriousness, the benefits received from the obstacles experienced in the action against the disease and the things that motivate the action [13].

Awareness of the importance of immunization in preventing infectious diseases in toddlers is key in efforts to increase basic immunization coverage. By understanding how the Health Belief Model Theory influences individual health-related behaviors, effective communication strategies can be designed to increase parents' awareness and motivation to provide immunizations to toddlers. Family support, clear information and targeted education can help strengthen an individual's belief in the benefits of immunization and the importance of preventive measures.

3.3 Family Culture

The description of family culture on immunization coverage of toddlers over 2 years of age is grouped into 2 categories presented in table 3.

Table 3. Overview of family culture towards immunization coverage

Family Culture	Frequency (F)	Percentage (%)
Support	67	77.0
Not Supportive	20	23.0
Total	**87**	**100.0**

Based on table 3, it can be seen that there are 67 respondents (77%) who receive basic immunization support by the family, while there are also 20 respondents (23%) who have a tendency for family culture to not support immunization in toddlers.

3.4 Socioeconomic Status

The description of the socioeconomic status of respondents on immunization coverage is grouped into 3 categories presented in table 4.

Table 4. Overview of Socioeconomic Status on Immunization Coverage

Socioeconomic Status	Frequency (F)	Percentage (%)
High	21	24.1
Moderate	48	55.2
Low	18	20.7
Total	**87**	**100.0**

Table 4 shows that most of the respondents 48 (55.2%) belonged to moderate socioeconomic status, 21 respondents with high economic status (24.1%) and 18 respondents were found to be in the low socioeconomic category (20.7%).

3.5 Correlation od Socio-Economic Status with Basic Immunization Status

Respondents' data were processed and bivariate analysis was carried out to see the correlation between socio-economic status and basic immunization status so that the results were presented in table 5.

Table 5. Correlation of Socio-Economic Status with Basic Immunization Status

Socio economic Status	Total of Immunization						f	%	Significance value (p)	Correlation Strength (r)
	High		Moderate		Low					
	f	%	f	%	f	%				
High	3	14.3	18	85.7	0	0.0	21	100.0	0.001	+0.363
Moderate	3	6.3	43	89.6	2	4.2	48	100.0		
Low	2	11.1	12	66.7	4	22.2	18	100.0		
Total	**8**		**73**		**6**		**87**			

Based on the results of statistical analysis on a ratio data scale for the variables (Spearman Rank test) in table 5, a significance value of p value of 0.001 ($p<0.05$) was found, indicating

that there is a significant correlation between socio-economic status and the level of completeness of basic immunization. This indicates that socioeconomic factors are one of the main predictors of the level of basic immunization in toddlers. These findings are in line with research conducted by Thesya, which explains that there is a significant relationship between the economy and the completeness of complete basic immunization in toddlers (p-value = 0.021) [14]. This confirms the importance of paying attention to socio-economic aspects in an effort to increase basic immunization coverage in children under five to achieve better public health goals.

There are several reasons why parents may not be able to immunize their children, one of which is their economic or financial situation which may affect their ability to pay for health care [15] . This can be because socio-economics will not be separated from the price of health services which are known to be relatively expensive and not easily accessible and affordable by the community if they have low socio-economic status [16]. However, this has become an important evaluation for the government. With immunization facilities provided free of charge by the government, such as Posyandu and Puskesmas, parents are less dependent on their socioeconomic conditions in providing immunizations to their children. These programs provide equal access to all levels of society, independent of economic status, thus equalizing the opportunity to get immunized. This is reinforced by Rahmawati's (2014) statement which states that the majority of people will prefer to use facilities provided free of charge by the government, such as posyandu so that parents do not need to pay for immunization [17].

However, it is interesting to note that this study also found that there was no significant correlation between family culture and immunization coverage. This may be because cultural norms in Bangkalan differ from other areas where family culture plays a more prominent role in health decision-making. In some areas, traditional values or religious beliefs may influence parental decisions regarding immunization, while in other places, family culture is more supportive of evidence-based decisions, such as vaccination. Further research needs to investigate how cultural dynamics influence immunization decisions and whether there are significant differences in family approaches across regions.

In this case, good socio-economic conditions can make it easier for children to access health facilities [18]. In addition, by having a higher socio-economic status, the family's purchasing power in the health sector will increase, so that prices will not be a problem as long as the services provided are comparable to what is expected [19]. The implication of research linking socioeconomic status with basic immunization coverage in children under five is the importance of focusing intervention efforts on groups with vulnerable socioeconomic status [20]. By understanding that socioeconomic factors influence immunization-related decisions, public health programs can be designed to increase immunization accessibility and awareness in these groups. Measures such as immunization subsidy programs, affordable health education, and improved access to health services can help overcome barriers caused by socioeconomic factors. In the context of this study, findings that confirm the relationship between socioeconomic status and basic immunization coverage among under-fives provide a strong foundation for inclusive and sustainable health policies. A holistic approach that considers socioeconomic aspects is needed in planning and implementing immunization programs. By strengthening cooperation between the health sector and related sectors, as well as involving communities in efforts to increase immunization coverage, it is expected to improve the overall and sustainable health of children.

3.6 Correlation between Family Culture and Immunization Status

The relationship between culture and the basic immunization status of respondents in the Blega Puskesmas working area is presented in table 6.

Table 6. Correlation between Family Culture and Basic Immunization Status

Family Culture	Number of Basic Immunizations						f	%	Significance value (p)	Correlation Strength (r)
	High		Moderate		Low					
	f	%	f	%	f	%				
Support	8	11.9	56	83.6	3	4.5	67	100.0	0.218	+0.133
Not Supportive	0	0.0	17	85.0	3	15.0	20	100.0		
Total	**8**		**73**		**6**		**87**			

Analysis of table 6 revealed the results of the Spearman Rank correlation statistical test with a p-value of 0.341 (p>0.05). The resulting significance value indicates that there is no significant relationship between the culture that exists in the family and the completeness of basic immunization status owned by a child. This result confirms that cultural factors present in the family environment do not significantly impact the level of completeness of basic immunization of children in the population studied.

Strong family support can increase compliance in providing immunizations, while lack of support can lead to low immunization coverage [21]. As in the research conducted by Fitrah (2020) shows that the culture exists in the family can affect the immunization, where mothers who are in a weak culture will show a good attitude in giving immunizations to their children [22]. Smith et al. (2018) stated that the values, beliefs, and practices adopted in the family environment can influence parents' decisions to immunize their children. If the family culture prioritizes alternative medicine or has concerns about the side effects of immunization, this can be a barrier to achieving optimal immunization coverage [23]. Mistadiana (2019) explained that finding that a supportive socio-cultural environment can increase maternal motivation to immunize by 4.113 times greater than an unsupportive environment [24]. This is also supported by Johnson et al. (2019) who highlighted the importance of cultural factors in understanding refusal or non-adherence to basic immunization in children [25].

Although previous studies showed an association between family culture and low coverage of basic immunization, a recent analysis showed different results. In this study, it was found that there was no significant correlation between family culture and low coverage of complete basic immunization in the working area of Puskesmas Blega (p-value = 0.113). This result suggests that family culture may not be a major determinant in immunization coverage. This finding is in line with the findings of Mella who showed that the majority of respondents were compliant in carrying out basic immunization in children, with 34 people out of a total of 65.4% respondents [26]. Nonetheless, this difference in results highlights the complexity and variety of factors that influence basic immunization coverage and emphasizes the importance of continuing to conduct in-depth and thorough research to understand the dynamics that occur in the field.

Although the results showed that there was no significant relationship between family culture and low coverage of basic immunization, there are other factors that influence this phenomenon. Further studies could investigate the role of factors such as accessibility of health services, parental knowledge about immunization, and social support in improving basic immunization coverage [27]. Research by Nisa et al. (2019) highlighted the important role of appropriate information and education in increasing parents' awareness and participation in immunization programs [28]. In addition, research by Rahayu et al. (2020)

emphasized the need for effective and inclusive communication strategies to overcome barriers that may arise in the implementation of basic immunization [29]. By considering these factors comprehensively, it is hoped that more effective efforts can be made to improve the socio-economic status of the community. With a high socio-economic status, it is also expected that an increase in the coverage of basic childhood immunization can be achieved and protect the overall health of children.

The implications of these results for global health are significant, particularly in regions with similar socioeconomic challenges. Low immunization coverage can exacerbate the burden of vaccination-preventable diseases, leading to the spread of infectious diseases that are detrimental to overall public health. It is therefore important to design health policies based on an understanding of the role of socioeconomics and culture in immunization decisions. By strengthening cooperation between the health, education and community sectors, and introducing inclusive and accessible programs, we can improve immunization coverage and child health globally.

4 Conclusion

Based on the results of the study, it was found that there was a significant correlation between the socio-economic status of respondents and the low coverage of basic immunization among under-fives (p-value = 0.001). This is because socio-economic status is inseparable from the price of health care which is relatively expensive and cannot be accessed easily by some communities. In addition, this study found that there was no significant correlation between family culture and low coverage of basic immunization in Blega Health Centre (p-value= 0.341). These results highlight the complexity of factors affecting basic immunization coverage, including values, beliefs and practices within the family environment that can be barriers or supportive in immunization implementation. This study suggests that to improve basic immunization coverage in children under five, it is important to pay attention to economic factors and community awareness, as well as cultural factors and social environment that influence parental decisions which can be done by conducting socialization to low economic communities.

References

1. World Health Organization, Vaccines and immunization. Accessed Feb. 11, 2024. Available from: https://www.who.int/health-topics/vaccines-and-immunization
2. E. Afrika et al., Peningkatan pengetahuan ibu tentang imunisasi dasar lengkap di PMB Hj. Nurachmi, S.ST., M.KES Kota Palembang Tahun 2023. Community Dev. J. **4**, 5302–5305 (2023). https://doi.org/10.31004/CDJ.V4I2.16608
3. Kementerian Kesehatan Republik Indonesia, Transformasi Kesehatan Mewujudkan Masyarakat Indonesia Sehat dan Unggul (2023).
4. Dinas Kesehatan Provinsi Jawa Timur, Statistik Kesehatan Provinsi Jawa Timur 2022 (2022).
5. D. Wulandari, M. D. M. Dwidiyanti, Pengetahuan dan persepsi ibu yang menolak pemberian imunisasi dasar balita. Indones. J. Med. Sci. **4**, (2017).
6. T. Indrayani et al., Analisis faktor-faktor yang memengaruhi ibu dalam pemberian imunisasi dasar pada waktu pandemi COVID-19. J. Keperawatan **15**, 203–212 (2023)
7. K. N. Islam, E. Andayanie, A. S. Batara, Gambaran sistem pelaksanaan program imunisasi dasar lengkap pada bayi di Puskesmas Kabupaten Pangkajene dan Kepulauan. Window Public Health J. **3**, 954–961 (2022). https://doi.org/10.33096/WOPH.V3I5.168

8. L. S. Rakasiwi, A. Kautsar, Pengaruh faktor demografi dan sosial ekonomi terhadap status kesehatan individu di Indonesia. Kajian Ekon. Keuang. **5**, 146–157 (2021)
9. W. Fitrah, S. Nurbaya, Y. Haskas, S. N. Hasanuddin, Faktor yang memengaruhi sikap ibu terhadap pemberian imunisasi campak di wilayah kerja Puskesmas Tamalanreakota Makassar. J. Ilm. Kesehatan Diagn. **15**, 241–245 (2020).
10. N. F. Amin, S. Garancang, Kamaluddin Abunawas, Konsep umum populasi dan sampel dalam penelitian. PILAR **14**, 15–31 (2023).
11. M. Juliawati et al., Analisis implementasi aktivitas fisik berdasarkan Health Belief Model oleh tenaga kesehatan di Puskesmas. Indones. J. Public Health Community Med. **1**, 54–62 (2020). https://doi.org/10.35801/IJPHCM.1.4.2020.31453
12. R. N. Mahabbah, Faktor-faktor yang berhubungan dengan kelengkapan imunisasi dasar (studi pada ibu yang memiliki baduta 12–24 bulan di Kelurahan Setiawargi Kecamatan Tamansari Kota Tasikmalaya Tahun 2019) (2019).
13. M. W. Nurul, Hubungan Health Belief Model dengan kepatuhan perawatan kaki pada penderita diabetes melitus tipe 2 di RSUD Sultan Syarif Mohamad Alkadrie Pontianak. Persepsi Masyarakat Terhadap Perawatan Ortodontik, **53**, 1689–1699 (2018).
14. T. G. Nadila, Hubungan dukungan keluarga, ekonomi, dan pengetahuan terhadap kelengkapan imunisasi dasar bayi usia 12 bulan pada masa pandemi COVID-19. J. Interprof. Kesehatan Indones. **2**, 211–219 (2022). https://doi.org/10.53801/jipki.v2i1.45
15. Mauidhah, F. Diba, Rahmawati, Faktor yang memengaruhi kepatuhan pemberian imunisasi dasar lengkap pada masa pandemi COVID-19 di Aceh. Idea Nurs. J. **12**, 62–69 (2021).
16. R. D. Wulandari, A. D. Laksono, Y. B. Prasetyo, Socioeconomic disparities in hospital utilization among female workers in Indonesia: A cross-sectional study. J. Prim. Care Community Health 13, (2022). https://doi.org/10.1177/21501319211072679
17. A. Mustofa et al., Administrasi Pelayanan Kesehatan Masyarakat (2020).
18. F. Paramita et al., Pemberdayaan masyarakat Desa Baturetno dengan meningkatkan pengetahuan MP-ASI sebagai upaya pencegahan kekurangan gizi balita. PROMOTIF: J. Pengab. Masy. **2**, 149 (2022). https://doi.org/10.17977/um075v2i22022p149-157
19. Sudaryanto, M. Sowwam, A. Wulandari, Hubungan status ekonomi dengan kelengkapan imunisasi dasar bayi usia 0 sampai 12 bulan. Osadhawedyah **1**, 43–49 (2023).
20. S. Arif, W. Isdijoso, A. R. Fatah, A. R. Tamyis, Tinjauan Strategis Ketahanan Pangan dan Gizi di Indonesia: Informasi Terkini 2019–2020 (2020).
21. L. Lushinta, F. I. T. Patty, E. Anggraini, R. A. Putri, Dukungan keluarga memengaruhi kelengkapan imunisasi dasar pada bayi dan balita. J. Kebidanan Malakbi **5**, 1 (2024). https://doi.org/10.33490/b.v5i1.1044
22. S. Katmawanti, L. Nikmatasari, S. Nurrochmah, The impact of education and income on environmental health aspects in urban households. In: Proceedings of the 1st International Scientific Meeting on Public Health and Sports (ISMOPHS 2019), Atlantis Press (2020), pp. 95–100.
23. R. Saputra, Strategi komunikasi dalam peningkatan kesadaran masyarakat terhadap imunisasi balita di Puskesmas Manggeng (Studi di Puskesmas Manggeng) (2017).
24. M. Mistadiana, A. Afiah, Hubungan pengetahuan dan sosial budaya terhadap motivasi ibu mengikuti imunisasi measles rubella di Desa Tarai Bangun wilayah kerja Puskesmas Tambang. PREPOTIF: J. Kesehatan Masy. **3**, 93–102 (2019)
25. B. P. D. Ranti, Valuasi kebijakan pelayanan kesehatan gratis (Studi kasus di RSUD Dr. A. Dadi Tjokrodipo Bandar Lampung) (2019).

26. M. R. S. Ritonga, Syarifah, Tukiman, Hubungan antara dukungan keluarga terhadap kepatuhan ibu melaksanakan imunisasi dasar pada anak di Desa Tigabolon Kecamatan Sidamanik Kabupaten Simalungun Tahun 2014. Fakultas Kesehatan Masyarakat USU **1**, 6615683 (2014).
27. D. N. Zen, T. Rohita, S. Sopiah, Hubungan sikap ibu yang mempunyai bayi dengan pelaksanaan imunisasi DPT di Puskesmas Kawali Kabupaten Ciamis. J. Keperawatan Galuh **3**, 29 (2021). https://doi.org/10.25157/jkg.v3i1.6585
28. D. A. Nikmah, Karingga, Pemberian edukasi tentang pentingnya imunisasi lengkap. Received 7 June; revised 10 June 2024; accepted 10 July 2024. J. Pengab. Masy. **2**, 4 (2024).
29. D. Sabri, M. Adam, S. Utami, H. Harmen, Manajemen sumber daya manusia dalam konteks perencanaan pembangunan (2024).