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Interest Profile of Infant's Mother on Receiving Multiple Injection Immunization

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ABSTRACT

Background: Multiple injections are giving more than one type of immunization in one visit which aims to protect children earlier in vulnerable times, immunization visits will be fewer so that it will make it easier for children with difficult or limited access to health services, people Older people do not need to come to health facilities repeatedly, increase efficiency for health service providers, and avoid missed opportunities. This study aimed to determine a significant relationship between the independent variables, namely knowledge, perceived vulnerability, perceived severity, perceived benefits, perceived barriers, and family support with the dependent variable, namely the infant's mother's interest in receiving multiple injection immunization.
Subjects and Method: This study was a cross sectional study. A sample of 407 infant's mothers were selected in this study. The dependent variable was namely the infant's mother's interest in receiving multiple injection immunization. The independent variable were namely knowledge, perceived vulnerability, perceived severity, perceived benefits, perceived barriers, and family support. The data were analyzed by SPSS application.
Results: The average score of correct answers related to the knowledge of mothers who are interested (Mean= 7.32; SD= 1.23) greater than mothers who are not interested (Mean= 5.23; SD= 0.87). The average score of correct answers related to the perceived vulnerability of mothers who are interested (Mean= 23.45; SD= 4.61) greater than mothers who are not interested (Mean= 10.39; SD= 0.87). The average score of correct answers related to the perceived severity of mothers who are interested in receiving multiple injection cages (Mean= 9.70; SD= 4.42) greater than mothers who are not interested (Mean= 7.45; SD= 0.92). The average score of correct answers related to the perceived benefit of mothers who are interested (Mean= 16.74; SD= 3.38) greater than mothers who are not interested (Mean= 7.32; SD= 0.70). The average score of correct answers related to the perceived barrier of mothers who are interested (Mean= 23.18; SD= 4.31) greater than mothers who are not interested (Mean= 11.78; SD= 1.17). The average score of correct answers related to the family support of mothers who are interested in receiving multiple injection cages (Mean= 28.89; SD= 5.16) greater than mothers who are not interested (Mean= 16.08; SD= 1.38). All these results were significant statistic ($p<0.001$).
Conclusion: There is a significant influence between knowledge, perceived vulnerability, perceived severity, perceived benefits, perceived barriers, and family support with the infant's mother's interest in receiving multiple injection immunization.

Keywords: multiple injections, immunization, infants mother.

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BACKGROUND

The immunization program that has been implemented in Indonesia since 1956 is part of a global commitment through the World Health Organization (WHO) (WHO, 2010) to eradicate and eliminate several diseases that can be prevented by immunization (Henderson, 2020). In general, there are two types of immunization in Indonesia, namely program immunization and optional immunization (The Ministry of Health Republic of Indonesia and UNICEF Indonesia, 2020). Program immunization is an immunization activity that is required for some communities to protect people in the area from all forms of diseases that can be prevented by immunization as a form of herd immunity (Pollard and Bijker, 2021). Program immunizations are divided into three, namely routine immunization, additional immunization, and special immunization. Meanwhile, optional immunization is an immunization that can be carried out by the community, the implementation of which is adjusted to the needs and carried out by competent personnel following statutory regulations (NHS, 2022).

Immunization is carried out through two types of administration, namely by oral and injection (Hayden et al., 2020). Oral administration of the vaccine is carried out for the polio vaccine while for vaccines given by injection, namely Inactivated Polio Vaccine (IPV), Hepatitis B, BCG, DPT-HB-HiB, and measles (Berzofsky, 2013). This is done by collaborating with various agencies to increase the coverage of complete basic immunization which is a government program (World Health Organization, 2013). In addition, the contribution of the community also plays an important role in achieving the success of immunization in Indonesia.

Multiple injections are giving more than one type of immunization in one visit which aims to protect children earlier in vulnerable times, immunization visits will be fewer so that it will make it easier for children with access to health services that are still difficult or limited, parents do not need to come to health facilities repeatedly, increasing efficiency for health service providers, and avoiding missed opportunities (UNICEF, 2018). The implementation of multiple injections is almost the same as the immunizations that have been done before, but the child has received two injections either at the same or different parts depending on the child's condition (Damnjanović et al., 2018). Several factors influence parents in deciding to receive multiple injections in one visit including the fear of adverse reactions or impacts on the immune system, pain and distress, confidence in vaccines, the risk of contracting a disease, and the benefits of multiple injection vaccines in terms of potential side effects, reliance on vaccines, risks of contracting the disease, as well as the benefits of some injectable vaccines (Cooper et al., 2021).

In supporting the achievement of optimal health, the Government has developed an immunization program with a variety of the latest policies, one of which is the establishment of the Conjugated Pneumococcus vaccine (PCV) in the routine immunization program following the Decree of the Minister of Health (Menteri Kesehatan RI, 2020) Number HK 02.02/Menkes/2534/2020 concerning Provision of Conjugated Pneumococcus Immunization (PCV). The implementation of PCV immunization is multiple injections because PCV1 and PCV2 immuni-

zations are given together with DPT-HB-HiB (Dubin et al., 2013). Implementation of multiple injections is not a new thing for parents, even so, it still requires a good approach from health workers to parents to increase parents' interest in carrying out multiple injection immunizations (Ministry of Health RI, 2019).

Previous research conducted in Tasikmalaya District using the Theory of Health Belief Model (HBM) (Grinberg and Sela, 2021) found that the factors causing mothers not to provide basic immunizations for their babies were perceptions of fear of side effects of immunization on children, traditions not to provide immunizations to families that correlated with low support. Families who do not allow children to be immunized, past experiences that were not good when immunizing children in healthcare facilities, and mothers' lack of knowledge about the importance of giving basic immunizations (Hobani and Alhalal, 2022). This is also supported by research conducted in Aceh where the mother's decision to provide complete basic immunization to her child during a pandemic is known to be influenced by factors of the mother's knowledge, mother's perception, and possible actions (Mulyana and Rahmatalia, 2022). Other similar studies in the city of Semarang using the HBM theoretical approach also explained that there is a correlation between the susceptibility and seriousness of disease as well as the benefits and constraints of immunization with visits from mothers to carry out basic immunizations for babies during a pandemic (Zampetakis and Melas, 2021; He et al., 2015).

To further encourage demand, acceptance, and interest in vaccination, it can be done by characterizing parents' beliefs about vaccination so that it can predict parental adherence to the recommended vaccinations (Hayden et al., 2020). Based on studies in low and middle-income countries, there are parents' concerns about vaccination, distrust in vaccination programs, and fear of potential side effects from vaccination. Parental doubts can lead to delays or rejection of vaccines. This is also supported by research conducted by Mukti on the factors that influence the low immunization coverage, which of course these factors will also have an impact on multiple injections as a type of immunization (Akwataghibe et al., 2019). Based on this study, only 3.5% of mothers had higher education, 77.9% of mothers lacked knowledge about immunization and 79.1% of mothers had low motivation to take their children to get immunized. These three factors are important because the lack of knowledge caused by the lack of mothers with higher education will greatly facilitate the spread of rumors about the after-effects of immunization which makes mothers afraid to bring their children to get immunized. If basic immunization with one injection in each visit does not get the mother's attention on the importance of this, it will be difficult to increase the motivation of the mother to do multiple injections where the vaccine will be given twice or more in each visit. Based on this background, this study aims to provide an overview of the infant's mother's interest in receiving multiple injection immunization.

SUBJECTS AND METHOD

1. Study Design

This study uses an observational analytic study with a cross-sectional approach. The location of this research was in Health Centers throughout Kendal Regency, carried out in March - December 2022.

2. Population and Sample

The population in this study were all mothers who had babies aged less than 12 months. The total population in this study was 10,096 people. The sample used was

407 subjects who met the inclusion criteria. The sampling technique in this study used Proportional Random Sampling.

3. Study Variables

The dependent variable was the mother's interest in receiving multiple injection immunization, namely interest, and disinterest. The independent variables were knowledge, vulnerability, severity, benefits, barriers, and family support.

4. Operational Definition of Variables

Knowledge was cognitive abilities of subjects about multiple injection immunization.

Vulnerability was subjects assessment of the possibility of disease if the child is not immunized with multiple injections.

Severity was subjects assessment of the adverse effects or seriousness that would arise if they were not immunized with multiple injections.

Benefit was subjects assessment of the benefits felt if the child is immunized with multiple injections.

Barries was subjects assessment of possible obstacles encountered in administering multiple injection immunizations.

Family support was encouragement from the head of the family or other families who live in the same house as the respondent to give multiple injection immunizations to their babies.

5. Study Instruments

The research instrument used in this study was a questionnaire containing questions about the factors that influence the mother's interest in receiving multiple injection immunization. This questionnaire is used to collect data through direct interviews with subjects. This questionnaire is in the form of closed questions which have the advantage of being easy to process (tabulate).

6. Data analysis

Data analysis in this research was carried out through quantitative tests using bivariate analysis with the help of the SPSS application. Bivariate analysis was performed on two variables that were suspected to be related or correlated. In this study, the function was to determine whether there was a significant relationship between the independent variables, namely knowledge, perceived vulnerability, perceived severity, perceived benefits, perceived barriers, and family support with the dependent variable, namely the infant's mother's interest in receiving multiple injection immunization.

7. Research Ethics

This research was conducted with the consent of research subjects, anonymity, confidentiality, and ethical approval from the ethics committee of the Faculty of Public Health, Diponegoro University, which was declared ethically feasible based on decision no. 364/EA/KEPK-FKM/2022.

RESULTS

Bivariate analysis shows the results of statistical tests between the variables knowledge, perceived vulnerability, perceived severity, perceived benefits, perceived barriers, and family support with maternal interest's infants receiving multiple injection immunization. The statistical test used in the bivariate analysis in this study was the Mann-Whitney test because the data were not normally distributed. The purpose of this test is to find out whether there is a difference in a parameter from two independent samples between one group and the second group (interest and disinterest). The following are the results of the bivariate analysis test.

Table 1 shows that the average score of correct answers related to the knowledge of mothers who are interested (Mean= 7.32; SD= 1.23) greater than mothers who are not interested (Mean= 5.23; SD= 0.87). The average score of correct answers related to the perceived vulnerability of mothers who are interested (Mean= 23.45; SD= 4.61) greater than mo-

thers who are not interested (Mean= 10.39; SD= 0.87). The average score of correct answers related to the perceived severity of mothers who are interested in receiving multiple injection cages (Mean= 9.70; SD= 4.42) greater than mothers who are not interested (Mean= 7.45; SD= 0.92). The average score of correct answers related to the perceived benefit of mothers who are interested (Mean= 16.74; SD= 3.38) greater than mothers who are not interested (Mean= 7.32; SD= 0.70). The average score of correct answers related to the perceived barrier of mothers who are interested (Mean= 23.18; SD= 4.31) greater than mothers who are not interested (Mean= 11.78; SD= 1.17). The average score of correct answers related to the family support of mothers who are interested in receiving multiple injection cages (Mean= 28.89; SD= 5.16) greater than mothers who are not interested (Mean= 16.08; SD= 1.38). All these results were significant statistic (p<0.001).

Table 1. Bivariate analysis between knowledge, perceived vulnerability, perceived severity, perceived benefits, perceived barriers, and family support with maternal interests' infants receiving multiple injection immunization

Variable	Mean	SD	Min	Max	p
Knowledge					
Interest	7.32	1.23	4	9	<0.001
Not interest	5.23	0.87	4	8	
Perceived vulnerability					
Interest	23.45	4.61	11	27	<0.001
Not interest	10.39	0.87	8	13	
Perceived severity					
Interest	9.70	4.42	5	19	<0.001
Not interest	7.45	0.92	6	10	
Perceived benefit					
Interest	16.74	3.38	7	20	<0.001
Not interest	7.32	0.70	5	8	
Perceived barrier					
Interest	23.18	4.31	9	26	<0.001
Not interest	11.78	1.17	9	15	
Family support					
Interest	28.89	5.16	13	34	<0.001
Not interest	16.08	1.38	11	20	

DISCUSSION

1. The relationship between knowledge and the mother's interest in receiving multiple injection immunization.

The results of the analysis of the relationship between knowledge and the infant's mother's interest in receiving multiple injection immunization using the Mann-Whitney test showed a p <0.001. This means that Ho is rejected and it can be concluded that there are different perceptions knowledge who are interested and mothers who are not interested in receiving multiple injection immunization.

This research is in line with research conducted by (Hidayat and Salmarini, 2020) that is, there is a relationship between a mother's knowledge and the completeness of booster immunization. In that study, 15 people (50%) had enough knowledge and 18 people (60%) received complete booster immunization.

The results of this study are supported by research (Sari et al., 2022), which shows the results of the study of 53 samples stu-

died, it was found that subjects who had good knowledge with complete basic immunization status 84.38%, and subjects who had less knowledge with complete basic immunization status were 47.62%. (Sari et al., 2022) also stated that the mother's knowledge is directly proportional to the completeness of basic immunization in toddlers.

According to research conducted by (Swandari, 2020), said that the better the respondent's knowledge, the greater the completeness of immunization status in their children, and less knowledgeable subjects will have children with incomplete immunization status. Knowledge is a very important domain for the formation of overt behavior. Knowledge-based behavior is generally more enduring (Darsini et al., 2019). Research conducted by (Nurlena et al., 2018) states that the knowledge factor plays an important role in providing basic immunization completeness because knowledge encourages the will and ability of the community so that a benefit will be obtained for the success of complete immunization.

2. The relationship between perceived vulnerability and the mother's interest in receiving multiple injection immunization

The results of the analysis of the relationship between perceived vulnerability and the infant's mother's interest in receiving multiple injection immunization using the Mann-Whitney test showed a p <0.001. This means that Ho is rejected and it can be concluded that there are different perceptions of vulnerability between mothers who are interested and mothers who are not interested in receiving multiple injection immunization.

This research is in line with research conducted by (Grinberg and Sela, 2021) that is, the average respondent's perception of the risk of their child getting measles was 2.73 (SD = 1.41). 29.8% (n = 54) strongly disagreed with the argument that their child was at low risk of getting measles, compared to 8.3% (n = 15) who strongly agreed with this argument. Additionally, 34.3% (n = 62) strongly disagreed with the statement that their child's health was too good for measles, compared to 3.3% (n = 6) who fully agreed with this statement.

We found that the higher the perceived susceptibility of mothers to their children against measles, the more likely they would give the vaccine. The literature on this issue also reveals a strong positive correlation. For example, (Smith et al., 2017) found that about 70% of parents who delayed or refused to vaccinate their children believed that their children might get measles if they were not vaccinated, compared to 90% of parents who routinely vaccinated their children. Furthermore, (Judith et al., 2019) argues that it makes sense that when people believe they are at risk, they do more to prevent it. Our findings reveal that even if mothers perceive measles as a serious illness if they do not believe their children are at risk of contracting it, they will not vaccinate them.

3. Relationship between severity perceptions and the infant's mother's interest in receiving multiple injection immunization

The results of the analysis of the relationship between perceived severity and the infant's mother's interest in receiving multiple injection immunization using the Mann-Whitney test showed a p-value of 0.000 where the p-value <0.05. This means that Ho is rejected and it can be concluded that there is a difference in perception of severity between mothers who are interested and mothers who are not interested in receiving multiple injection immunization.

This research is in line with research conducted by (Grinberg and Sela 2021) that is, the mean perceived severity of measles

was very high (5.41; SD= 0.97). Most subjects (79.6%; n= 144) fully agreed that measles is highly contagious and causes complications, compared to 1.1% (n= 2) who reported that they completely disagreed with this statement. Moreover, 80.1% (n= 145) of mothers strongly agreed that measles was dangerous, compared to 2.8% (n= 5) who reported that they disagreed that all of it was harmful. Moreover, 71.8% (n= 130) of subjects agreed that the statement that measles was fatal was very similar, versus 2.2% (n = 4) who disagreed completely with this statement.

This study found that mothers' perceptions of disease severity, namely measles and an infectious disease that can be deadly, were found to be consistent with their willingness to vaccinate their children. Similar findings were reported by Sun and colleagues (National Association of Community Health Centers, 2019). The severity of the disease especially the likelihood of long-term damage—is the most powerful factor influencing parents' vaccine decisions.

When parents consider the disease mild, they seem to prefer 'natural immunization'. It's in contradiction with a meta-analysis (Damnjanović et al., 2018), which found a weak association between perceived severity and intention to vaccinate. It is possible that in Israel, where there had been an outbreak of measles not long before this study was conducted, and which has been widely reported in the media, parents' decision-making is likely to be affected. During 2018–2019, 4000 new cases of measles (mainly in children under 9 years of age) and three deaths were reported. While very high vaccination coverage in other countries might have reduced the perceived severity of the disease, in Israel the results of the recent outbreak appear to have exacerbated it.

4. The relationship between perceived benefits and the mother's interest in receiving multiple injection immunization.

The results of the analysis of the relationship between perceived benefits and the interest of the infant's mother in receiving multiple injection immunization using the Mann-Whitney test showed a p <0.001. This means that Ho is rejected and it can be concluded that there are different perceptions of benefits between mothers who are interested and mothers who are not interested in receiving multiple injection immunization.

This research is in line with research conducted by (Smith et al., 2017) i.e. understanding which factors are consistently associated with the decision to vaccinate one's child is important for identifying the messages that public health communications should target about routine childhood vaccinations. the average perceived benefit from the measles vaccine was very high (5.41; SD= 1.12). The majority of mothers (74%; n= 134) strongly agreed to vaccinate their children because the measles vaccine saves lives. 71.8% (n= 130) strongly agreed that the measles vaccine reduced morbidity in Israel, compared to 2.2% (n= 4) who strongly disagreed with this statement. Additionally, 71.3% (n = 128) agreed that the measles vaccine reduced their child's risk of contracting the disease. It was also found that the higher the benefits felt by the mothers, the more they indicated their willingness to give the measles vaccine. In this study, the perceived benefits variable ranked second in its positive influence on the decision-making process. This supports the findings of Smith and colleagues (Damnjanović et al., 2018), which showed that parents who delay or refuse vaccines perceive fewer benefits and more disadvantages of vaccines than parents who routinely vaccinate their children.

5. The relationship between perceived barriers and the mother's interest in receiving multiple injection immunization

The results of the analysis of the relationship between perceived barriers and the infant's mother's interest in receiving multiple injection immunization using the Mann-Whitney test showed a p <0.001 This means that Ho is rejected and it can be concluded that there are different perceptions of barriers between mothers who are interested and mothers who are not interested in receiving multiple injection immunization.

This research is in line with research conducted by (Grinberg and Sela 2021) that is, the average perceived barriers that influence a mother's decision to vaccinate her child against measles is relatively low (Mean= 3.92; SD= 0.25). Most subjects (80.7%; n= 146) strongly disagreed with the statement that they would not vaccinate their child because of the risk of autism, compared to 4.4% (n = 8) who reported they strongly agreed with this statement. Only 2.2% (n = 4) of mothers strongly agreed with the statement that they would not vaccinate their child against measles because the vaccine causes the disease, compared to 85.6% (n= 155) who did not agree with this statement at all. Moreover, the majority of mothers (81.8%; n= 148) strongly disagreed that the disadvantages of the measles vaccine outweigh the benefits, compared to 6.1% (n= 11) who strongly agreed with this statement. In addition, the majority of subjects (89.5%; n= 162) strongly disagreed with the statement that they did not intend to vaccinate their children because one child was too sensitive to the vaccine, not 0.6% (n = 1) who strongly agree with this statement. Finally, most subjects (82.3%; n= 149) strongly disagreed with the statement that they did not intend to vaccinate their children because the vaccine contained such a dangerous substance as mercury, while 2.2% (n = 4) reported complete agreement with this statement.

According to research conducted by (Smith et al., 2017), that is, there is mixed evidence of an association between perceptions around dual vaccination and taking combination vaccines. Three studies reported that parents did not vaccinate their children because they felt that they were receiving too many or enough injections (Akwataghibe et al., 2019; Pcv, 2021; Hobani and Alhalal, 2022); others report that parents do not want children to have multiple vaccines at once (Mulyana and Rahmatalia, 2022). One study found an association between vaccine refusal and the belief that children receive too many vaccines, and that many vaccinations overwhelm the immune system (Hayden et al., 2020), whereas two studies found no association (Pcv, 2021; Ministry of Health RI, 2020). Similarly, only one of three studies found an association between not receiving multiple vaccines in one encounter and vaccine refusal (Zampetakis and Melas, 2021). Although this was a good-quality study, the one that found no association was also of good quality (He et al., 2015), while the other was of moderate quality (Mulyana and Rahmatalia, 2022). The perception that combination vaccines are a greater concern than single vaccines and that too many go in one go (Grinberg and Sela, 2021); that combination vaccines are dangerous (Damnjanović et al., 2018); and that separate vaccines are more appropriate than combination vaccines (Pcv, 2021) is also associated with vaccine rejection.

2. Relationship between family support and the mother's interest in receiving multiple injection immunization

The results of the analysis of the relationship between family support and the mother's

interest in receiving multiple injection immunization using the Mann-Whitney test showed a p<0.001. This means that Ho is rejected and it can be concluded that there are differences in family support between mothers who are interested and mothers who are not interested in receiving multiple injection immunization.

This research is in line with research conducted by (Ilhami and Afif, 2020) that the effect of family support on immunization has a significant value of 0.015 on emotional support, while the support of appreciation, instrumental support, and informative support are not substantial. According to previous research on community rejection of complete primary immunization for infants, the research subjects did not provide complete primary immunization to their children due to the lack of support from the environment, including from parents, husbands, and friends. Therefore, there was no encouragement to get immunizations (Sulistiyani, 2017).

Family support is a critical factor for the completeness of immunization because it will encourage parents to immunize their children. Family support such as from parents, in-laws, siblings, and husbands can be achieved by giving attention, empathy, encouragement, advice, and sharing knowledge. Also, the family participates in caring for a child so it has a significant influence on the decision to give immunizations. This study used the social support theory, assuming that the source of support from family members such as parents, siblings, children, relatives, and partners provides examples for individuals to perform or suggest a healthy behavior. There are four forms of social support. First, emotional or esteem support, which includes empathy, caring for someone so that it gives a comfortable feeling, attention, and positive acceptance, and gives encouragement to the person being faced. The second is tangible or instrumental support, including assistance given directly or tangibly, as well as people who share or lend money, shop, and care for children. The third is informational support to provide advice, direction, suggestion, or feedback about how people do things. This support can be done by providing the information needed by the public. The last is companionship support. This type of support is a willingness to spend time with others by giving a feeling of membership in a group of people who are interested in sharing and social activities (Marmot and Wilkinson, 2012).

AUTHOR CONTRIBUTION

In this study, SEP and AS collaborated to develop a conceptual framework and research methodology. AEP, AS and FA collaborated to analyze the data.

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CONFLICT OF INTEREST

There is no conflict of interest.

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