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Research

Correlations between Maternal Age, Education, and Knowledge on the Compliance of COVID-19 Vaccine Uptake in Children Aged 6 – 11 Years

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ABSTRACT

Background: The coverage rate for giving the COVID-19 vaccine to children in several regions of Indonesia is still in the low category, one of which is in Abeli District, Kendari City. One of the factors that can affect the low administration of vaccines to children is due to mothers' concerns about their children so they are hesitant and reluctant to be given the COVID-19 vaccine. This study aims to analyze the relationship between age, education, and knowledge of mothers with compliance with the COVID-19 vaccine in children aged 6-11 years in Abeli District, Kendari City.
Subjects and Method: A cross-sectional study was conducted in Abeli District, Kendari City, from August to October 2022. A total of 90 subjects were selected using a proportionate stratified random sampling technique. The dependent variable is adherence to giving the COVID-19 vaccine to children. The independent variables include age, education, and mother's knowledge. The instrument used is a questionnaire. Data analysis used was the Chi Square test.
Results: Adherence to maternal COVID-19 vaccine administration increased with knowledge (OR= 3.57; 95% CI= 1.46 to 8.75; p= 0.007). Meanwhile, age (OR= 0.34; 95% CI= 0.14 to 0.83; p= 0.003) and education (0.31; 95% CI= 0.12 to 0.31; p= 0.020) reduced maternal adherence in administering the COVID-19 vaccine to children.
Conclusion: There is a significant relationship between age, education, and mother's knowledge with compliance with the COVID-19 vaccine in children aged 6-11 years in Abeli District, Kendari City.

Keywords: maternal age, maternal education, knowledge, COVID-19 vaccine.

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BACKGROUND

Vaccination is the process of administering a vaccine in the body that aims to create and actively enhance a person's immune system against a disease (Donnelly, 2017). Administering the COVID-19 vaccine to children aims to stimulate the formation of immunity or the child's immunity against COVID-19 disease (Wan et al., 2021). The fulfillment of giving COVID-19 vaccinations

to children is influenced by the role of parents, especially a mother, in making decisions about giving vaccines or not to their children (Goldman et al., 2021). Every mother has a different perception of COVID-19 vaccination so that it can affect mother's compliance in vaccinating her child against COVID-19 (Wan et al., 2021).

Coronavirus is a positive (RNA) envelope, namely a single-stranded ribonucleic acid virus that can infect several species with zoonotic transmission (Rantam et al., 2022). The 2019 coronavirus disease is a problem that is happening globally which is the biggest pandemic that has occurred in the twenty-first century (Wulandari et al., 2021). The COVID-19 disease outbreak caused by severe acute respiratory syndrome coronavirus 2 or SARS-CoV-2 was first discovered in Wuhan, China and has spread rapidly in various countries around the world (Soedarsono et al., 2021).

The country of Indonesia is one of the countries experiencing the COVID-19 pandemic with the distribution number as of February 16 2022 that confirmed positive for COVID-19 reaching 4,966,046 people and the number of deaths from COVID-19 reaching 145,622 people (RI Ministry of Health, 2022). Even so, there are still many Indonesians who think that COVID-19 is normal (Khaerunnisa et al., 2021). This can be seen from some people who still pay less attention to ways to protect themselves, such as not wearing masks, not implementing social distancing, and not washing their hands regularly, thus making the spread of the virus from individual to individual very fast (Sari et al., 2021). So, to be able to suppress the acceleration of the spread of the COVID-19 virus, not only by intervening in implementing health protocols, but also other effective interventions, namely vaccination efforts (Wan et al., 2021).

Based on data from the Indonesian Pediatrician Association (IDAI) positive cases of COVID-19 in children aged 0-18 years amounted to 12.6% which means that 1 out of 8 people who contract COVID-19 is a child. Positive cases of COVID-19 for children aged 1-5 years were 2.9% with a mortality rate of 0.6% and children aged 6-18 years were 9.7% with a mortality rate of 0.6%. Vaccination regulations for children aged 6-11 years are carried out in order to prevent an increase in COVID-19 cases in children and to break the chain of mutual transmission between adults and children apart from implementing strict health protocols (Indonesian Pediatrician Association, 2021).

The target for COVID-19 vaccination for children aged 6-11 years in Indonesia is 26,400,300 people with the achievement as of March 21 2022 for the first dose of 71.25%, namely 18,810,213 people and the second dose, namely 58.24%, namely 15,375,534 people. The target for COVID-19 vaccination for children aged 6-11 years in Kendari City is 37,352 people, with the achievement as of March 21 2022 for the first dose of 6.23%, namely 2,327 people and for the second dose, namely 2.58%, namely 963 people. Based on recommendations from the World Health Organization (WHO) vaccination coverage in an area to form herd immunity can be achieved with a minimum vaccination target of 70%. Based on the data that has been obtained, it can be illustrated that achievement of the COVID-19 vaccination target for children aged 6-11 years in Kendari City is still in the low category (Diskominfo, Kendari City, 2022).

Based on the results of a preliminary study conducted by researchers in Abeli District, Kendari City, data were obtained as of March 15, 2022, from the number of children aged 6-11 years, namely 824, 78 children who had received the COVID-19 vaccine. Based on this background, researchers are interested in conducting research

entitled the relationship between age, education, and knowledge of mothers with compliance with the COVID-19 vaccine in children aged 6-11 years in Abeli District, Kendari City.

SUBJECTS AND METHOD

1. Study Design

This research was conducted using an observational analytic study design with a cross-sectional approach. The study location is in Abeli District, Kendari City, Southeast Sulawesi. The research was conducted in August - October 2022.

2. Population and Sample

The population in this study were all mothers who had children aged 6-11 years in Abeli District, Kendari City. The sample size in this study was 90 samples using a sampling technique, namely Proportionate Stratified Random Sampling.

3. Study Variable

The dependent variable is mother's obedience. The independent variables are age, education, and mother's knowledge.

4. Operational Definition of Variables

Maternal compliance is adherence to giving the COVID-19 vaccine to children. The measuring tool uses a questionnaire with a nominal data scale. Code 1 for obedient mothers and 2 for non-compliant mothers.

Maternal age is the length of time the mother lives which can be measured in units of time. The measuring tool uses a questionnaire with a nominal data scale. Code 1 for ages 18-29 years and 2 for ages ≥ 30 years.

Maternal education is a process of maturing mothers through teaching and training efforts. The measuring tool uses a questionnaire with an ordinal data scale. Code 1 is for low education (Not in school, SD, SMP) and code 2 is for higher education (SMA/SMK and college/ academic).

Mother's knowledge is mother's insight regarding the COVID-19 vaccine in children. The measuring tool uses a questionnaire with an ordinal data scale. Code 1 for low knowledge and 2 for high knowledge**.**

5. Study Instrument

The instrument used in this study was a questionnaire or questionnaire that was distributed offline. The questionnaire that has been made includes the independent variables namely age, education, and mother's knowledge while the dependent variable is regarding mother's compliance in administering the COVID-19 vaccine to children aged 6-11 years. Questions in the questionnaire included 1 question regarding mother's compliance in administering the COVID-19 vaccine to children aged 6-11 years, 1 question about mother's age, 1 question about mother's education, and 14 questions about mother's knowledge by scoring using a guttman scale.

6. Data Analysis

The research data will be analyzed univariate and bivariate using SPSS for windows. The bivariate analysis used is the Chi square test (X2). The conclusion results are based on the results of a comparison of the significance value (p) obtained with the desired significance level (α) (α = 5% or 0.05).

7. Research Ethics

The study obtained an agreement between the researcher and the research subject, guaranteeing anonymity, and confidentiality of the data. The study also obtained a statement of ethical clearance No. 128/EC/KEPK-/FKUA/2022, on 18 Juli 2018 from the Faculty of Medicine, Universitas Airlangga.

RESULTS

1. Sample Characteristics

The research subjects in this study were 90 mothers. The characteristic frequency distribution in this study is described in Table 1. Table 1 shows that most of children of the study subjects, namely 6 years old, were 26

children (28.8%) and most of the research subjects did not work, 49 subjects (54.4%).

Table 1 sample characteristic

Variable	Category	Frequency (n)	Percentage (%)
Age	18-29 years	17	18.9
	≥ 30 years	49	54.4
Education	Low	53	58.9
	High	37	41.1
Knowledge	Low	46	51.1
	High	44	48.9
Compliance	Yes	51	56.7
	No	39	43.3

2. Univariate Analysis

Univariate analysis in this study included mother's age, mother's education, mother's knowledge, and mother's compliance which can be seen in table 2. Table 2. Shows that the research subjects with the most ages in this study were the age group ≥ 30 years as many as 49 out of 90 (54.4 %). Mother's education group that occupies the highest position, namely mothers with low education as many as 53 respondents or 58.9%. The most knowledge of respondents is at a low level of knowledge as many as 46 respondents or 51.1% and obedient mothers as many as 51 respondents or 56.7%.

3. Bivariate Analysis

Bivariate analysis was carried out to see the relationship between mother's age, mother's education, and mother's knowledge with adherence to giving the COVID-19 vaccine to children. The results of the bivariate analysis can be seen in Table 3. Table 3 shows that adherence to giving the COVID-19 vaccine increased with knowledge (OR= 3.57; 95% CI= 1.46 to 8.75; p = 0.007). Meanwhile, age (OR= 0.34; 95% CI= 0.14 to 0.83; p= 0.003) and education (0.31; 95% CI= 0.12 to 0.31; p= 0.020) reduced maternal compliance in administering the COVID-19 vaccine.

Table 2. Univariate Analysis

Variables	Frequency (n)	Percentage (%)
Body mass index		
<18.5 (Underweight)	12	14.6
18.5 – 25.0 (Normal weight)	62	75.6
25.1 - 27.0 (Overweight)	5	6.1
>27.0 (Obese)	3	3.7
Psychological Stress		
Normal	29	50.9
Mild	11	19.3
Moderate	16	28.1
Severe	1	1.8
Physical activity		
Very light	54	65.9
Light	17	20.7
Moderate	8	9.8
Vigorous	1	1.2
Very vigorous	2	2.4

Table 3. Bivariate analysis

Variable	Mother's Compliance				OR	95% CI		p
	No		Yes			Lower Limit	Upper Limit	
	N	%	N	%				
Mother's age								
18-29 years	19	55.9	15	44.1	0.34	0.142	0.8	0.030
≥30 years	17	30.4	39	69.4				
Mother's education								
Low	27	50.9	26	49.1	0.31	0.12	0.31	0.020
High	9	24.3	28	75.7				
Mother's knowledge								
Low	25	54.3	21	45.7	3.57	1.46	8.75	0.009
High	11	25	33	75				

DISCUSSION

1. Relationship between Mother's Age and Compliance with Giving the COVID-19 Vaccine to Children

Based on the results of this study indicate that most of the mothers referred to in the adult age group, namely age ≥30 years. This research is in line with research conducted by Goldman et al (2021) with the results of a bivariate statistical test which has a p=0.001 explaining that there is a significant relationship between maternal age and adherence to giving the COVID-19 vaccine to children.

Based on the research by Montalti et al (2021) that the age of the mother has an influence on administering the COVID-19 vaccine to children, most mothers aged 30-49 years give the COVID-19 vaccine to children. One of the factors that can affect a mother's adherence to giving the COVID-19 vaccine to children is doubts about the safety and function of the COVID-19 vaccine for children. In this study it was found that the level of doubt about the COVID-19 vaccine for children was higher in mothers aged ≤29 years. This opinion can be strengthened by looking at the OR results of the relationship between age and doubts about giving the COVID-19 vaccine to children. Mothers aged ≤29 years had an OR value of 1.89, meaning that mothers aged ≤29 were 1.89 times more likely to have doubts about giving the COVID-19 vaccine to children than mothers aged 30-49 years. This can be interpreted that the increasing age of the mother, the level of doubt about giving the COVID-19 vaccine to children will decrease.

According to Montalti et al. (2021) mothers of mature age will have positive perceptions and intentions regarding compliance with the COVID-19 vaccine in children. Based on the Big Indonesian Dictionary (KBBI) that the word intention has the meaning of the will or desire in one's heart to do something. Based on research by Li et al (2020) a mother's intention to vaccinate her child against COVID-19 is an important factor in administering the COVID-19 vaccine to children. A mother's intention to vaccinate her child has a relationship with the mother's age. Mothers aged 31-40 years or as much as 60.7% have a higher intention to vaccinate their children against COVID-19 compared to mothers who are under 30 years old or as much as 4.8%. This is in line with the research of Babicki et al (2021) that 40 percent of mothers aged 36-44 years have the intention and desire to vaccinate their children as soon as possible.

Therefore, in this study it can be concluded that the increasing age of the mother, the level of adherence to giving the COVID-

19 vaccine to children will also increase. This is in accordance with research conducted by Bagateli et al (2021) that based on the age group ≥30 years, as many as 85% agreed and complied with carrying out Covid-19 vaccinations for children, while mothers in the age group ≤ 29 years were only 11% agree and comply with the administration of the COVID-19 vaccine to children.

2. Relationship between Mother's education and Compliance with Giving COVID-19 Vaccines to Children

This research is in line with research by Li et al. (2020) that there is a significant relationship between educational level and mother's compliance in giving the COVID-19 vaccine to children, where mothers with low education are more unwilling to vaccinate their children against COVID-19.

The results of this study are also in line with research conducted by Učakar et al (2018) in Slovenia which stated that giving vaccines to children can be influenced by a mother's educational level. Mother's educational status is one of the determinants of vaccine acceptance and compliance in developed and developing countries. Mohan et al (2022) mothers with low education were 110 (53.9%) and mothers with higher education were 94 (46.1%). Based on the results of this study it is known that mothers with higher education have a value of p= 0.001 and OR = 4.92 which means that mothers are more willing to vaccinate their children 4,916 times compared to mothers with low education. This is because mothers who are highly educated feel that their children will be safe if they have received vaccinations, that way mothers are obedient to giving the COVID-19 vaccine to children.

A higher level of education will have a better understanding of the information obtained about vaccines as well as general knowledge on matters related to child health (Giannakou el al. 2021). Mothers with higher education will have good literacy on matters related to health, so they understand more about the importance of vaccination for children compared to mothers with low education (Bianco et al., 2019). In line with the research of Li et al. (2020) that mothers with low education will have less literacy regarding health so that it can cause mothers not to know accurately about the function of the COVID-19 vaccination for children.

3. Relationship between Mother's Knowledge and Compliance with Giving COVID-19 Vaccines to Children

This research is in line with the research of Kyprianidou et al. (2021) that there is a significant relationship between a mother's knowledge and COVID-19 vaccination activities in children with OR= 8.92. The OR value means that mothers who have high knowledge of COVID-19 vaccination will be 8.92 times more compliant to follow the recommended dose for their children.

Research conducted by Del Giudice et al. (2022) explained that a mother's knowledge of the COVID-19 vaccine will affect the availability and adherence of mothers to administering the COVID-19 vaccine to children. Mothers who have good knowledge will have the perception that children who are given the COVID-19 vaccine will have a lower risk of exposure to COVID-19 when compared to children who are not given the COVID-19 vaccine. This is because giving the COVID-19 vaccine will form immunity and COVID-19 antibodies in the child's body. Research conducted by Mintz et al. (2021) explains that although children can reduce their risk of exposure to COVID-19 by practicing distance, wearing masks and avoiding crowded groups and keeping their distance, it is very difficult to monitor and ensure that children consistently follow health protocol practices, so one way for mothers is to vaccinate their children against COVID-19

Research conducted by Giannakou et al. (2021) that in Greece as many as 98% of the 1,885 mothers who participated gave the COVID-19 vaccine to their children and 89% of mothers had a high level of knowledge. Mothers who have a high level of knowledge about the COVID-19 vaccine are because mothers have received information about COVID-19 vaccinations for their children. One source of information regarding COVID-19 vaccination in children can be obtained from a pediatrician. Parents have a responsibility in making decisions related to children's health, one of which is regarding vaccination. Many factors can influence parents' decisions about vaccinating their children, including concerns about the effectiveness and safety of vaccines, knowledge about vaccines, and sources of information about vaccines (Ramadan et al., 2016). A mother's knowledge of vaccines can be a major determinant of the decision to give, postpone or refuse vaccination. Mothers who have accurate knowledge about vaccination will show a positive attitude towards vaccination activities so that they are more likely to be vaccinated (Alshammari et al., 2018).

AUTHOR CONTRIBUTION

In this study, Lilis Sri Supiatun M and Zera Qurrota A'yuni collaborated to create a conceptual framework and research methodology. Isnin Anang Marhana collected data. Lilis Sri Supiatun and Dominicus Husada collaborated to analyze the data.

FUNDING AND SPONSORSHIP

The study was self-funded.

CONFLICT OF INTERESTS

There is no conflict of interest in this study.

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