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SOCIO-DEMOGRAPHIC FACTORS OF IMMUNIZATION STATUS FOR CHILD AGE 12-23 MONTHS IN INDONESIA

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ABSTRACT:

Immunization is one of the most powerful and cost-effective health interventions. Every child age 0-11 months in Indonesia is entitled and obliged to receive complete immunization. Based on Indonesia Demographic Health Survey (IDHS) 2017, it showed the percentage of children age 12-23 months who received all basic immunizations increased from 59% in 2007 to 65% in 2017. This study aimed to determine the socio-demographic factors associated with the immunization status for a child age 12-23 months in Indonesia using the 2017 IDHS data. The sample was 3.535 women age 15-49 years who had children age 12-23 months. The dependent variable in this study was immunization status, while the independent were sociodemographic factors (mother's age, sex of child, residence, current marital status,educational attainment, occupation, and wealth quintile). In this study, mother's age (OR = 1.7; 95% CI = 1.008 - 2.901), educational attainment (OR = 1.2; 95% CI = 1.01 - 1.454), and wealth quintile (OR = 1,2; 95% CI = 1,121 – 1,283) had an association with the immunization status of children age 12-23 months. The success key of the immunization program can provide high immunization coverage and maintain the immunity that exists in society.

Keywords: Sociodemographic Factors, Immunization Program, Indonesia Demographic Health Survey (IDHS).

I. INTRODUCTION

Globally, the first years of life have an 85% risk of deaths among children in 2018, counting from 5.3 million deaths around the world, 4 million (76 percent) occurred in the first month of life until age 11 months[1]. In Indonesia, the national rate of infant mortality was 33.4 deaths per 1000 live births at 2017[2]. Health status of children as the future of all over the worlds determined by mortality rate[3]. Mortality in infants mostly occurred in the poorest quintile and uneducation groups[2]. The main causes of infants death in Indonesia are pneumonia, diarrhoea, birth defects and infections[4]. One of the ways that can prevent infectious diseases is immunization[5].Immunization is a way to increase child's immune system, so that if affected by the disease[6], they will not hurt or have only mild pain. Immunization is one of the most powerful and cost-effective health interventions and one of the best investments in health. Most spreading and dangerous childhood diseases can be prevented and reduced by Immunization[7]. Every child aged 0-11 months in Indonesia is entitled and obliged to receive complete immunization[8].Complete immunization is a routine immunization given to infants before age one year[8]. A child must receive at least one dose of Bacille Calmette-Guérin (BCG) vaccine which protects

against tuberculosis; four doses of HepB vaccine (including a dose at birth) to protect against hepatitis B; three doses of DPT vaccine, which protects against diphtheria, pertussis (whooping cough), tetanus; Four doses of polio vaccine; and one dose of measles vaccine.[9]Information on immunization coverage was collected from a mother and child health handbook (KesehatanIbu dan Anak [KIA]), a health card (KartuMenujuSehat [KMS]), an immunization card or any other immunization record, or a mother's direct report[9].

Based on Indonesia Demographic Health Survey 2017, it showed the percentage of children age 12-23 months who received all basic immunizations increased from 59% in 2007[10] to 65% in 2017.[9] However, complete immunization coverage is influenced by various factors, such as the attitude of the officer, the location of the immunization, the presence officer, mother's age, mother's educational level, family income per month, trust against adverse effects of immunization, mother's employment status, family traditions, mother's level of knowledge, and family support[11].This study aims to determine the socio-demographic factors associated with the immunization status for child age 12-23 months in Indonesia using the 2017 IDHS (Indonesian Demographic and Health Survey) data.

II. METHODS

This study used data from the Indonesia Demographic Health Survey (IDHS) Program which comes from 34 provinces in Indonesia. Data can be accessed on the website http://dhsprogram.com/data/availabledatasets.cfm. The study population was children born alive in the last five years as many as 18,645 children. The IDHS 2017 sampling aims to present estimates at the national and provincial levels of population and maternal and child health. The sample includes the census block originating from the 2010 population census block. The sample selection is carried out in two stages, first in regencies/ cities, a systematic probability proportional to size (PPS) census block was selected with the size of the number of households listing with stratification according to urban, rural and welfare index. The second stage, systematically selecting households for each census block.

Data collection of the IDHS focused on indicators of fertility, reproductive health, maternal and child health, mortality, nutrition, knowledge, attitudes and behaviour on certain issues. This research is an analytical study with a cross-sectional design, which can determine the events and effects at the same ti[30] The population was all women aged 15-49 who had children born alive in the last five years in Indonesia at the time of the 2017 IDHS survey, while the sample was 3,535 women aged 15-49 years who had children age 12-23 months with the criteria of respondents having data complete on all analyzed variables.The dependent variable in this study was immunization status, while the independent was sociodemographic factors (mother's age in 5 years group, sex of child, residence, current marital status, mothers educational attainment, mother's occupation, and wealth index). The data analysis used a complex sample so that the results of the study were more accurate by taking into the stratification, clustering and weight of children age. Percentages and the Chi-square test were used as univariate and bivariate analysis.

III. RESULTS

The results of the study based on characteristics of respondents (table 1) show that the majority of mothers in this study were in the 30-34 age group as much as 26.3%, while the lowest was the 45-49 age group at 1.0%. 65.0% of children under five in Indonesia received complete basic immunization in 2017. Most of the sexes of children under five are women compared to men with a percentage of 50.5% compared to 49.5%. Mothers who live in urban areas and with a married status are more with a percentage of 51.2% and 97.1%, respectively. Most of the mothers graduated from high school education, as much as 29.8% and did not work as much as 55.5%.

Table 1. Respondent's Characteristics

Characteristics	Categorical	Percentage[a] (%)
Immunization Status	Incomplete immunization	35.0
	Complete immunization	65.0
Mother's age in 5 years group	15-19 years	2.9
	20-24 years	19.0
	25-29 years	25.4
	30-34 years	26.3
	35-39 years	19.3
	40-44 years	6.0

	45-49 years	1.0
Sex of child	Female	50.5
	Male	49.5
Residence	Rural	48.8
	Urban	51.2
Current marital status	Not married	2.9
	Married	97.1
Mother's Educational attainment	No education	0.7
	Incomplete primary	5.0
	Complete primary	19.0
	Incomplete secondary	29.0
	Complete secondary	29.8
	Higher	16.5
Mother's Occupation	Not working	55.5
	Working	44.5
Wealth index	Poorest	19.7
	Poorer	19.9
	Middle	21.9
	Richer	18.9
	Richest	19.6

[a]Percentage were calculated by n = 3,535 children age 12-23 months

The mother's age group of 30-34 years was the age group that provides the most complete basic immunizations for their toddlers. The odds of mothers aged 30-34 years of giving complete basic immunization to their children were 1.7 times higher than that of other mother's age groups (OR = 1.7; 95% CI = 1.008 - 2.901). In addition, the majority of mothers' education level is not completing elementary school (SD) as much as 58.0%, followed by the percentage of mothers who did not go to school as much as 55.5% with incomplete immunization status. The odd ratios of mothers with no education that did not provide complete basic immunization to their children were 1.2 times higher (OR = 1.2; 95% CI = 1.016 - 1.454). The poorest mothers also had an odd ratios 1.2 (OR = 1.2; 95% CI = 1.121 – 1.283) it means that mothers with the poorest status were 1.2 times more likely to not give their children complete immunizations (table 2).

Table 2. Association Between Socio-Demographic Factors and Immunization Status.

Independent Variable	Categorical	Immunization Status		aOR[a]	CI 95%	P value
		Incomplete (%)	Complete (%)			
Mother's age in 5 years group	45-49 years	45.8	58.2	Ref	Ref	
	40-44 years	41.1	58.9	1.245	0.565 – 2.745	0.568
	35-39 years	41.7	58.3	1.247	0.655 – 2.374	0.502
	30-34 years	34.8	65.2	1.710	1.008 – 2.901	0.047[b]
	25-29 years	38.6	61.4	1.491	0.937 – 2.372	0.092
	20-24 years	39.6	60.4	1.462	0.911 – 2.348	0.116
	15-19 years	49.6	50.4	1.026	0.868 – 1.211	0.766
Sex of child	Female	38.7	61.3	Ref	Ref	
	Male	39.2	60.8	1.019	0.848 – 1.224	0.840
Residence	Rural	41.0	59.0	Ref	Ref	
	Urban	36.8	63.2	0.840	0.701 – 1.007	0.060
Current marital status	Not married	48.6	51.4	Ref	Ref	
	Married	38.6	61.4	1.501	0.939 – 2.399	0.088
Mother's Educational attainment	Higher	32.0	68.0	Ref	Ref	
	Complete secondary	34.3	65.7	1.096	0.822 – 1.459	0.532
	Incomplete secondary	37.9	62.1	1.138	0.753 – 1.721	0.539
	Complete primary	48.1	51.9	0.912	0.517 – 1-609	0.752
	Incomplete primary	58.0	42.0	0.746	0.339 – 1.641	0.466
	No education	55.5	45.4	1.215	1.016 – 1.454	0.033[b]

Mother's Occupation	Not working	38.6	61.4	Ref	Ref	
	Working	39.4	60.6	0.968	0.813 – 1.153	0.719
Wealth index	Richest	32.3	67.7	Ref	Ref	
	Richer	32.2	67.8	1.205	0.927 – 1.565	0.164
	Middle	39.1	60.9	1.072	0.858 – 1.339	0.540
	Poorer	41.0	59.0	1.188	0.948 – 1.490	0.134
	Poorest	49.7	50.3	1.199	1.121 – 1.283	0.000[c]

[a]aOR = Adjusted Odd Ratio

[a] = p value < 0.05

[c] = p value < 0.001

IV. DISCUSSION

This study aims to determine the socio-demographic factors associated with the immunization status for child age 12-23 months in Indonesia using the 2017 IDHS (Indonesian Demographic and Health Survey) data. In this study, mother's age group of 30-34 years, mother with no education, and the poorest mother had an association with the immunization status of children age 12-23 months, hence the other factors such as sex of child, residence, marital status, and mother's occupation had no association with the immunization status. Mother's age group of 30-34 years showed the odd ratios of 1.710, which means that mothers in age group of 30-34 years were 1.7 times more likely to give their child a complete immunizations. This finding was in line with the results of previous research conducted by Mukungwa (2015) in Zimbabwe, which stated that mothers of middle ages (25-34 years) had a tendency to give their child complete immunizations[12].

Adenike, et al (2017) in their study about maternal characteristics and immunization status in Nigeria also stated that there was significantly association between maternal age and child's immunization status (p>0.004) because of mothers in the middle ages mostly know the effect and the importance of immunization on children than younger and older mother[13].The more mature the mother's age, then the experience of mother in making an effort preventive for children including immunize the children complete will be increased. Therefore, age is one important factor which is owned by the mother in attainment immunize her child[14].

Furthermore, mothers with no education showed an odds ratio of 1.215, which means that mother with no education were 1.2 times more likely to give their child incomplete immunizations. Balogun, et al (2017) in their study found that mothers with no education has a lower percentage of complete immunization than educated mothers (30.5% vs. 48.9%)[15].Similar study also done by Meleko, Geremew, and Birhanu (2017) whose found that the higher educational attainment of mother had 3.1 times more likely to be fully immunized than the lower educational attainment[16]. Mothers with higher education will have a tendency to gather health information to make better decisions about health for their family, including immunization[17]. Particularly, mother's educational attainment were associated with better child health. Primary healthcare programs should be focused on seek ways of improving mother's ability at child rearing, because in developing country there were so many less educated mother [18]. Investing in women's education was considered very important because it can improve family health status and gender equality [19].

This study also found that mothers with the lowest wealth quintile were 1.2 times more likely to give their children incomplete immunizations than mothers in the higher wealth quintile.This study also similar with other study conducted by Boulton, et al (2014) whose concluded that odd ratios of those the poorest wealth quintile were 0.367 (95% CI 0.195–0.688), means they more likely gave their children incomplete immunizations than those in the richest wealth quintile [20]. Other study done by Adebowale, et al (2019) also shown that wealth quintile was an important predictor of complete immunizations by AOR = 1.95 (95% CI 1.35–2.80), that means complete immunization 1.95 times higher among the children of richer mother than the poorest[21].Mothers who were richer were expected to be more likely accepted a modern health service than mothers who were poorer [22]. Mothers with the poorest quintile had less opportunity to finance and do all that was necessary to get the best health services for the care of their children [23].

V. CONCLUSION

Socio-demographic factors associated with the immunization status were mother's age group of 30-34 years, mother with no education, and the poorest wealth quintile. In this case, it was suggested to focus more on

improving women's education and knowledge, especially in health and health services. Increasing women's education and knowledge were a valuable investment in children's lives. Furthermore, the success key of the immunization program can provide high immunization coverage and maintain immunity that exists in society.

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