Research Article

Infant and Young Child Feeding (IYCF) Practices in Rural and Urban Regions of Indonesia

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Background. The global strategy on infant and child feeding recommends the best pattern of feeding for infants and young child feeding (IYCF) from birth to 24 months. Practices of proper feeding of children up to 2 years of age contribute to a child's survival, growth, and development because they can prevent micronutrient deficiencies, morbidity, and obesity in later life. This study aims to determine the risk factors for the failure of IYCF practice in urban and rural Indonesia. *Materials and Methods.* The study used Indonesia Demographic and Health Survey (IDHS) 2017 data with a cross-sectional research design. The sampling technique used systematic probability proportional to size sampling. The number of samples was 4,869 children consisting of 2,424 children in urban and 2,445 children in rural. Bivariate analysis using chi-square test. Multivariate analysis using multivariate logistic regression. *Results.* The study found that most of the children in urban (79.3%) and rural (97.2%) did not practice IYCF under the recommendations. There is a difference in the proportion of IYCF practices between urban and rural areas ($p < 0.001$). The risk factors for the failure of IYCF practice in urban areas are socioeconomic, maternal age, and age at first marriage. The poorest socioeconomic is at risk of 2.4 times, maternal age > 35 years are at risk of 1.5 times, age at first marriage is less than 21 years at risk of 2.1 times carrying out IYCF practices not according to recommendations compared to the comparison group. The risk factors for the failure of IYCF practice in rural are socioeconomic, maternal education, quantity, and quality of antenatal care (ANC). The poorest socioeconomic is at risk of 2.1 times, mothers with primary education are at 1.5 times, the quantity of ANC is not good at risk at 1.9 times, the quality of ANC is not good risk at 1.5 times practicing IYCF is not according to the recommendations compared to the comparison group. *Conclusion.* The practice of IYCF in Indonesia starting from giving early breastfeeding initiation, exclusive breastfeeding, and complementary feeding according to recommendations is still low. The priority of IYCF intervention through education and assistance to pregnant women needs to be a sustainable program.

1. Introduction

The global strategy on infant and child feeding recommends the best pattern of feeding for infant and young child feeding (IYCF) from birth to 24 months of age, namely early breastfeeding initiation (EBI), exclusive breastfeeding, and complementary feeding since the child is 6 months old, and continue to breastfeed until the child is 24 months old [1]. It is reported that 25%–50% of parents practice inappropriate feeding of their children [2]. A good IYCF intervention significantly reduces stunting prevalence and improves children's nutritional status. In developing countries, less than a quarter of children aged 6–23 months meet the minimum acceptable diet, dietary diversity, and standardized eating frequency [3]. Inappropriate feeding in children is seen in poor quality of macro and micronutrients, frequency, consistency, an inappropriate amount of food, poor food, and water safety, contamination, poor hygiene, and unsafe food processing and preparation [4]. It is reported that two-thirds of children under five died due to the wrong diet, as a result of children not getting exclusive breastfeeding, children getting solid food too early and or too late, then the composition of nutrients is incomplete, unbalanced, and unhygienic [5].

In Indonesia, only 60% of children consume the minimum food groups according to the recommendations, and

only 72% of children receive the minimum frequency of eating according to the recommendations, and 40% of children get the practice of IYCF according to the recommendations [1]. IYCF practices that are not by recommendations are influenced by education, knowledge, occupation, socioeconomic factors, maternal age, child age, birth spacing, access to information, postnatal visits, access to clean water, access to health services, area of residence, utilization of antenatal care (ANC), and postpartum examination [6–8]. The area of residence is related to exclusive breastfeeding, mothers who live in urban areas are more at risk of not giving exclusive breastfeeding than mothers who live in rural areas [9]. In Indonesia, the median length of breastfeeding in rural areas (22.4 months) is longer than children in urban areas (20.7 months). The 2017 Indonesian Demographic Health Survey Report shows children in urban areas consume a more diverse diet than children in rural areas; more children receive the recommended minimum frequency of eating in urban areas (76%) than in rural areas (68%). The percentage of children who receive IYCF practices according to the recommendations is higher in urban areas (46%) than in rural areas (35%) [1].

The problem of IYCF practices by region in Indonesia as a risk factor varies the prevalence of child nutrition problems from 0 to 23 months. Differences in urban and rural characteristics of Indonesia can increase the risk of nutritional problems in toddlers [10]. The problem of underweight toddlers in rural areas (18.8%) is higher than in urban (14.5%) [11], and the problem of stunting toddlers in rural areas (30.8%) is higher than in urban areas (26.9%) [12]. Children living in rural areas are more at risk of stunting than children in urban areas ($p < 0.0001$) [13]. The results found that there are differences in toddler food intake in urban and rural Indonesia [14], there are significant differences in toddler food diversity in urban and rural areas ($p = 0.005$), diversity of toddler food according to recommendations in urban areas (62.7%) is higher than in rural areas (42.9%) in East Nusa Tenggara, Indonesia [15]. Children who come from rich families and live in urban areas have more access to referral health services, while children under five who come from poor families and live in rural areas have better access to basic health services. The disparity between urban and rural poor families is very wide. The proportion of poor and very poor families in rural areas (46.6%) is higher than in urban areas (14.5%) [16]. In urban areas, women are more likely to earn more income outside the home while the number of family members is less, so childcare is better, in urban areas, there is also greater availability of food, water, electricity, sanitation, housing, health services, and employment opportunities [17].

Research on determinants of IYCF practices has been widely conducted, but research that analyzes factors that affect IYCF practices in cities and villages in Indonesia is still very limited, so further analysis needs to be carried out by utilizing data from national surveys. The novelty in this research is the composite of infant and child feeding practices starting from early initiation of breastfeeding, exclusive breastfeeding, and complementary feeding based on food diversity and frequency of feeding. The results of this study are expected to be material for policy recommendations to improve IYCF practice in Indonesia.

2. Objective

The objectives of this study were to find out the practice of IYCF in Indonesia, to determine the characteristics of families, mothers, and children based in urban and rural areas of Indonesia, and to identify risk factors associated with the practice of IYCF in urban and rural Indonesia. Various results of previous studies mostly analyzed the determinants of child feeding practice with a single variable.

3. Methods

3.1. Data Source. The research design used a cross-sectional design approach using the 2017 Indonesia Demographic and Health Survey (IDHS) [1]. The IDHS was conducted in 34 provinces throughout Indonesia. The population of IDHS is women of childbearing aged 15–49 years who have children aged 6–24 months. Data collection for the 2017 IDHS was carried out by trained enumerators using the same structured questionnaire as the DHS implementation in other countries. The 2017 IDHS uses a stratified two-stage sampling design. Stage 1: Select several census blocks in a systematic probability proportional to size (PPS) manner with the number of households from the 2010 Population Census listing (SP 2010). Systematically carried out with an implicit stratification process according to urban and rural areas and by sorting census blocks based on the Wealth Index category from the SP2010 results. Stage 2: Select 25 ordinary households in each selected census block systematically from the results of updating households in each census block. The 2017 IDHS successfully interviewed 49,627 women of reproductive age (aged 15–49 years). Samples in this study were selected that met the criteria, namely data from women of reproductive age (aged 15–49 years), whose last child was aged 6–24 months, and complete data were available for all research variables analyzed. The number of samples that met the criteria was 4,869 children consisting of 2,424 children in urban areas and 2,445 children in rural areas. Research variables were identified from the 2017 IDHS questionnaire. The questionnaires used in the 2017 IDHS are of three types, namely Household Questionnaire, Women's Questionnaire, and Men's Questionnaire, which were developed based on standard DHS model questionnaires. The IDHS questionnaire is a modification of the DHS questionnaire used globally, modified to the local context, and translated into Indonesian. The 2017 IDHS questionnaire has passed the validity and reliability test stage before being used for field investigations to maintain the quality of the data collected Supplementary 1 [1]. This study used a Household Questionnaire to collect household information, such as socioeconomic status, number of household members, and number of toddlers. The Women's Questionnaire was used to collect information on the mother's education, mother's occupation, mother's age, marital status, parity, age of first marriage, utilization of ANC services, maternity history, birth spacing,

and child characteristics (sex and child's birth weight), neonatal health services.

3.2. Variables.

The dependent variable is the practice of IYCF in urban and rural areas. The Ministry of Health of the Republic of Indonesia recommends that the IYCF be performed by the recommendations (AR) if the child receives early breastfeeding, does not receive prelacteal food, exclusive breastfeeding, frequency, and diversity of complementary feeding according to the child's age [1]. If one or several stages of feeding the child are not appropriate, then the IYCF is not by the recommendations (NAR). The independent variables are family characteristics (socioeconomic status, number of household members, and number of toddlers), maternal characteristics (mother's education, mother's occupation, mother's age, marital status, parity, age of first marriage, pregnant planning, ANC place, ANC quantity, ANC quality, and birth spacing) and child characteristics (sex, child's birth weight, and neonatal examination).

The type of residence consists of two types, namely urban and rural. Classification of family economic status based on ownership of household assets. To determine the economic status of households, each household item or facility is weighted based on the principle of the analysis component, and the sum of scores on household assets or facilities is standardized to follow a normal distribution, then divided into five quintiles and becomes an economic status index (*wealth index*), namely richest, richer, intermediate, poor, and poorest. The number of household members is the number of people who live in a household who are in one house and eat together. The number of household members is divided into two categories, namely small families (≤4 people) and large families (>4 people). Number of children under five in the family is the number of children under five who are born and live in families. The number of children under five in the family is categorized into two categories, namely 1 toddler and >1 toddler.

Children under 2 years are determined based on the last month's birthday (in months). The sex of children under 2 years consists of two types: male and female. A child's birth weight is a baby's body weight weighed at birth in grams based on data recorded in the card toward health/maternal and child health book, or based on respondents' memories. A child's birth weight is categorized as LBW if the birth weight is ≤2,500 g, and normal (not LBW) if the birth weight is >2,500 g. Birth spacing is the period in the year of a child's birth is analyzed with the birth of a previous child. Birth spacing is categorized into the first child, less than 2 years, and ≥2 years. The neonatal check-up is a type of worker who examines newborns, which are categorized into health workers and nonhealth workers.

The survey determines maternal education based on the last certificate held by mothers of children under 2 years. Maternal education consists of three levels: higher (college), intermediate (senior high school), and elementary (primary school and under, and junior high school). Maternal occupation status consists of two categories: unemployed and employed. Mother's age is the length of life of a woman of childbearing age (years) from birth to the time of IDHS 2017. Mother's age is categorized into <20 years, 20–35 years, and >35 years old. Age at first marriage: Maternal age is determined based on the last birthday (in years). Age at first marriage is categorized into two criteria, namely less than 20 years and 20 years. Marital status is the status of a married couple when data collection is carried out. Maternal marital status includes having a couple (married) and no partner (never married/widowed/divorced). Parity is the frequency of labor that has been experienced by the mother both at birth and stillbirth. The parity was divided into three criteria, namely primiparous (1 child), multiparous (2–4 children), and grand multiparous (>4 children). Maternal age at delivery is the age of the woman of childbearing age (years) at the time of childbirth of the analyzed child. Maternal age of first marriage is categorized into two criteria, namely less than 21 years and greater than or equal to 21 years. Planning for pregnancy is the mother's desire when pregnant with a child that is analyzed. Planning pregnant is categorized into unwanted pregnancy and desired pregnancy.

Quantity of ANC measured by standards of the Ministry of Health of the Republic of Indonesia. The ANC quantity was divided into two criteria, good and not good. Quantity of ANC is categorized as good if we carry out ANC at least four times during pregnancy with the provisions of at least one time in the first trimester, one time in the second trimester, and two us in the third trimester. Quality of ANC is measured by the type of service received by mothers when doing ANC. The Ministry of Health of the Republic of Indonesia makes ANC standards to get 10 types of services (weight, measuring height, and blood pressure, taking blood samples, urine tests, taking Fe tablets ≥ 90 tablets, and explanation of signs of pregnancy complications). The ANC quantity was divided into two criteria, namely good and not good. The ANC quantity is categorized as good if during ANC the mother gets at least 10 types of pregnancy checks. The place of ANC is a type of staff who checks the pregnancy of pregnant women. ANC places are categorized into two groups, namely health workers and nonhealth workers. The place of delivery is the location chosen to give birth to the last child. Place of delivery was divided into two criteria, namely health facility and nonhealth facility.

3.3. Data Analysis.

The data were analyzed using SPSS software version 20.0. Before data analysis, data completeness and consistency checks are carried out. Bivariate analysis used a chi-square statistical test and a logistic regression to describe the differences in the proportions of family, mother, and child characteristics in urban and rural areas and to describe the differences in the proportions of IYCF practice based on the characteristics of families, mothers, and children in urban and rural areas. The results of the bivariate analysis showed the results of the proportion difference test between independent variables using the significance of p-value < 0.05. Bivariate analysis is also the stage of selection of candidate variables for multivariate analysis ($p \leq 0.25$). Multivariate analysis was used to determine the relationship of more than one independent variable with the dependent

TABLE 1: Characteristics of families and children in urban and rural Indonesia.

Characteristics	Urban	Rural	Total	p-Value
Socioeconomic status				
Richest	16.4	16.2	16.3	
Richer	19.6	14.4	17.0	
Intermediate	20.2	19.1	19.6	<0.001
Poor	21.7	19.1	20.4	
Poorest	22.1	31.2	26.7	
Number of household members				
Small family	56.1	57.4	56.7	0.369
Big family	43.9	42.6	43.3	
Number of toddlers				
1 toddler	65.0	66.3	65.7	0.346
>1 toddler	35.0	33.7	34.3	
Sex				
Male	52.6	53.0	52.8	0.820
Female	47.4	47.0	47.2	
LBW history				
Normal	90.1	88.3	89.2	0.048
LBW	9.9	11.7	10.8	
Birth spacing				
The first child	32.1	32.5	32.3	
<2 years	6.8	7.5	7.2	0.588
≥2 years	61.1	60.0	60.5	
Neonatal check-up				
Health workers	54.4	74.2	64.3	<0.001
Nonhealth workers	45.6	25.8	35.7	

LBW, low birth weight.

TABLE 2: Characteristics of mothers in urban and rural Indonesia.

Mother characteristics	Urban	Rural	Total	p-Value
Mother's education				
Higher	24.7	15.2	20.0	
Intermediate	60.4	53.5	57.0	<0.001
Elementary	15.0	31.3	23.0	
Mother's occupation				
Work	48.0	45.2	46.6	0.047
Not work	52.0	54.8	53.4	
Mother's age				
<20 years	3.1	5.0	4.0	
20–35 years	75.5	76.6	76.0	<0.001
>35 years	21.5	18.3	20.0	
Marital status				
Have couple	98.3	97.7	98.0	0.112
No partner	1.7	2.3	2.0	
Parity				
Primiparous	32.0	32.4	32.2	
Multiparous	63.2	59.6	61.4	<0.001
Grande-multiparous	4.8	8.0	6.4	
Age of first marriage				
≥21 years	95.0	93.5	94.3	0.02
<21 years	5.0	6.5	5.7	
Pregnant planning				
Wanted pregnant	89.8	94.4	92.1	<0.001
Unwanted pregnant	10.2	5.6	7.9	
ANC place				
Health facility	94.2	80.1	87.2	<0.001
Nonhealth facilities	5.8	19.9	12.8	
ANC quantity				
Good	79.0	66.4	72.7	<0.001
Not good	21.0	33.6	27.3	
ANC quality				
Good	19.3	18.2	18.8	0.333
Not good	80.7	81.8	81.2	
Place of delivery				
Health facility	90.1	66.1	78.1	<0.001
Nonhealth facilities	9.9	33.9	21.9	

LBW, low birth weight; ANC, antenatal care.

variable and to see which variable was most dominantly related from several independent variables to the dependent variable using a multivariate binary logistic regression test. The final model looks at the adjusted odd ratio (AOR) value and a significant p-value of <0.05 as IYCF-related factors in rural and urban areas. Data are presented in tabular form.

4. Results

The number of household members and the number of children under five in the household no difference in the proportion between urban and rural areas, but differed significantly according to based on socioeconomic, low birth weight history, and neonatal check-ups (Table 1).

The proportion of maternal characteristics according to marital status and ANC quality is no difference between urban and rural areas ($p > 0.05$), but the proportion differed significantly according to variables such as maternal education, maternal occupation, maternal age, parity, maternal age at first marriage, pregnancy planning, ANC place, ANC quantity, and place of birth (Table 2).

The proportion of IYCF practices is no different between urban and rural areas based on the provision of EBI ($p = 0.885$), prelacteal feeding ($p = 0.065$), exclusive breastfeeding ($p = 0.07$), and the frequency of complementary feeding ($p = 0.645$). Significant differences between urban and rural areas are seen in the proportions of diversity of complementary feeding ($p < 0.001$) (Table 3).

The IYCF practice in urban areas differs according to socioeconomic ($p < 0.001$), while in rural areas, it differs according to socioeconomic ($p < 0.001$) and the number of children under five in the family (Table 4).

In urban areas, there is no difference in the proportion of IYCF according to the mother's occupation, marital status, parity, age at first marriage, planning for pregnancy, and quality of ANC. In rural areas, there is no difference in the proportion of the mother's occupation, marital status, age at first marriage, and planning for pregnancy (Table 5).

The final model shows that urban areas of Indonesia are socioeconomically poorest (AOR = 2.429, 95% CI: 1.669–3.534), socioeconomically poor (AOR = 2.01, 95% CI: 1.425–2.836),

TABLE 3: Frequency distribution of IYCF practices in urban and rural Indonesia.

Infant and young child feeding practices	Urban	Rural	Total	p-Value
Early breastfeeding initiation				
Yes	57.1	57.3	57.2	0.885
No	42.9	42.7	42.8	
Prelacteal food				
Not	56.2	53.5	54.8	0.065
Yes	43.8	46.5	46.2	
Exclusive breastfeeding				
Exclusive breastfeeding	38.2	40.8	39.5	0.07
Nonexclusive breastfeeding	61.8	59.2	60.5	
Diversity of complementary feeding				
According to recommendation	34.9	20.7	27.8	<0.001
Not according to recommendation	65.1	79.3	72.2	
Frequency of complementary feeding				
According to recommendation	57.3	57.9	57.6	0.645
Not according to recommendation	42.7	42.1	42.4	
IYCF				
According to recommendation	20.7	12.8	16.8	<0.001
Not according to recommendation	79.3	97.2	83.2	

IYCF, infant and young child feeding.

TABLE 4: IYCF practices based on family characteristics.

	Infant and young child feeding					
Characteristics	Urban (%)			Rural (%)		
	AR	NAR	p-Value	AR	NAR	p-Value
Socioeconomic						
Richest	25.4	12.5		22.9	15.2	
Richer	24.5	17.0		19.4	13.7	
Intermediate	17.9	21.7	<0.001*	20.4	19.0	<0.001*
Poor	18.8	22.2		19.7	19.0	
Poorest	13.4	26.6		17.5	33.2	
Number of households						
Small family	59.7	55.2	0.070*	59.2	57.1	0.477
Big family	40.3	44.8		40.8	42.9	
Number of toddlers						
1 toddler	64.3	65.2	0.695	74.2	65.1	0.002*
>1 toddler	35.7	34.8		25.8	34.9	
Sex						
Male	52.1	52.8	0.784	52.9	53.0	0.970
Female	47.9	47.2		47.1	47.0	
LBW history						
Normal	90.2	90.1	0.919	87.9	88.4	0.792
LBW	9.8	9.9		12.1	11.6	
Birth distance						
The first child	34.7	31.5		38.5	31.6	
<2 years	5.6	7.1	0.235*	4.5	7.9	0.011*
≥2 years	59.7	61.4		57	60.4	
Neonatal check-up						
Health workers	50.1	55.6	0.023*	56.7	65.9	<0.001*
Nonhealth workers	49.9	44.4		43.4	34.1	

*Variable candidate multivariate analysis ($p < 0.25$). AR: according to the recommendation, the child receives early breastfeeding and does not receive prelacteal food, exclusive breastfeeding, frequency, and diversity of complementary feeding according to the child's age. NAR: not according to recommendation if one or several stages of feeding the child are not appropriate.

TABLE 5: Infant and young child feeding practices based on mother's characteristics.

| Mother's characteristics | Infant and young child feeding | | | | | |
| | Urban (%) | | | Rural (%) | | |
	AR	NAR	p-Value	AR	NAR	p-Value
Mother's education						
Higher	27.9	23.8		24.4	19.0	
Intermediate	61.3	60.1	0.006*	61.2	56.0	<0.001*
Elementary	10.8	16.1		14.4	25.0	
Mother's Job						
Work	48.5	47.8	0.776	49.3	46.0	0.081*
Not work	51.5	52.2		50.7	54.0	
Mother's age						
<20 years	1.8	3.4		79.6	75.4	
20–35 years	79.4	74.5	0.035*	2.2	4.4	0.004*
35 years	18.8	22.2		18.2	20.2	
Marital status						
Have a couple	99.0	98.1	0.177*	98.4	97.9	0.351
No partner	1.0	1.9		1.6	2.1	
Parity						
Primiparous	34.7	31.3		36.1	31.4	
Multiparous	60.9	63.8	0.318*	59.8	61.7	0.002*
Grande-multiparous	4.4	4.9		4.2	6.9	
Age of first marriage						
≥21 years	94	95.3	0.250	94.1	94.3	0.874
<21 years	6	4.7		5.9	5.7	
Pregnant planning						
Wanted pregnant	90	89.8	0.862	91.2	92.3	0.271
Unwanted pregnant	10	10.2		8.8	7.7	
ANC place						
Health facility	85.2	77.4	<0.001*	83.4	70.5	<0.001*
Nonhealth facilities	14.8	22.6		16.6	29.5	
ANC quantity						
Good	96.2	93.7	0.033*	91.7	86.2	<0.001*
Not good	38	3.8		8.3	13.8	
ANC quality						
Good	20.4	19.0	0.486	22.7	17.9	0.001*
Not good	79.6	81.0		77.3	82.1	
Place of delivery						
Health facility	92.8	89.4	0.024*	85.4	76.6	<0.001*
Nonhealth facilities	7.2	10.6		14.6	23.4	

*Variable candidate multivariate analysis (p <0.25). IYCF, infant and young child feeding; AR, according to the recommendation; NAR, not according to recommendation; ANC, antenatal care.

socioeconomic intermediate (AOR = 1.961, 95% CI: 1.401–2.746), and age of first marriage <21 years (AOR = 2.153, 95% CI: 1.304–3.555), age of mothers >35 years (AOR = 1.484, 95% CI: 1.101–1.999) at risk of IYCF practices not by recommendations compared to the comparison group. In rural Indonesia, the socioeconomically poorest (AOR = 2.069, 95% CI: 1.382–3.098), mother's education elementary (AOR = 1.52, 95% CI: 1.011–2.286), the quantity of ANC is not good (AOR = 1.553, 95% CI: 1.917–2.595), the quality of ANC is not good (AOR = 1.553, 95% CI: 1.173–2.056) at risk of IYCF practices not by recommendations compared to the comparison group (Table 6).

5. Discussion

The worrying practice of IYCF in Indonesia (only 57.1% of children received EBI, 38.2% exclusive breastfeeding, 34.9% diversity of complementary feeding according to recommendation, 57.3% frequency of complementary feeding according to recommendation) is almost the same as the conditions in other countries low and middle income, only 44% of infants received early initiation of breastfeeding, 42% of exclusive breastfeeding, only 53% of children received the minimum frequency of eating, only 29% of children received the minimum variety of food; and five out of six children did

TABLE 6: Risk factors of infant and young child feeding practice in urban and rural Indonesia.

Risk factors	Urban			Rural		
	β	p-Value	AOR (95% CI)	β	p-Value	AOR (95% CI)
Mother's age						
20–35 years	—	0.007	1	—	—	—
<20 years	0.501	0.167	1.559 (0.747–3.254)	—	—	—
>35 years old	0.428	0.003	1.484 (1.101–1.999)	—	—	—
Age of first marriage						
≥21 years	—	—	1	—	—	—
<21 years	0.631	0.0011	2.153 (1.304–3.555)	—	—	—
Socioeconomic						
Richest	—	<0.001	1	—	0.002	1
Richer	0.280	0.068	1.369 (1.004–1.865)	−0.005	0.980	0.995 (0.676–1.464)
Intermediate	0.640	<0.001	1.961 (1.401–2.746)	0.227	0.239	1.255 (0.860–1.833)
Poor	0.686	<0.001	2.010 (1.425–2.836)	0.167	0.399	1.182 (0.802–1.744)
Poorest	0.959	<0.001	2.429 (1.669–3.534)	0.727	<0.001	2.069 (1.382–3.098)
Mother's education						
Higher	—	—	—	—	0.009	1
Intermediate	—	—	—	−0.065	0.701	0.937 (0.671–1.307)
Elementary	—	—	—	0.419	0.044	1.520 (1.011–2.286)
ANC quantity						
Good	—	—	—	—	—	1
Not good	—	—	—	0.651	<0.001	11.917 (1.417–2.595)
ANC quality						
Good	—	—	—	—	—	1
Not good	—	—	—	0.440	0.002	1.553 (1.173–2.056)
Constant	0.134	—	—	1.090	—	—

ANC, antenatal care; AOR, adjusted odd ratio.

not receive the minimum acceptable diet (both the minimum eating frequency and minimum dietary diversity needed to reduce the risk of malnutrition) [18].

Exclusive breastfeeding practice among under-6-month infants was significantly associated with place of residence, maternal educational level, ANC visits, family size, mode of delivery, and place of delivery [19]. The findings of this study, the age of the mother at the time of having an infant is related to the practice of IYCF. In urban areas, mothers aged <20 years have a risk of 1.559 times the practice of IYCF not according to recommendations compared to the age of mothers aged 20–35 years. The age of 20–35 is a good age for the reproductive period, and at that age have a better lactation ability than mothers aged >35 years because the production of breast milk at the age of >35 years is less. Meanwhile, those aged <20 years are not psychologically ready to become mothers so they become a psychological burden that causes depression and makes it difficult for breast milk to come out [20]. Young mothers will be more at risk because mothers do not know much information about good child feeding, and mothers also do not have experience being a mother providing parenting to children. If a mother has experience and information about IYCF according to the recommendations, it will reduce the risk of children experiencing malnutrition or malnutrition. The results of this study also indicate that mothers aged >35 years are at risk of practicing IYCF not according to

the recommendations. This shows that a maternal age of >35 years does not guarantee that mothers can carry out IYCF practices well, this is influenced by many factors. Maternal factors such as education, maternal age, socioeconomic, culture, geographic location, and utilization of health services are related to minimum dietary diversity, minimum eating frequency, and minimum acceptable diet [21]. Maternal age, educational level, and nutrition knowledge significantly increased the age at which infants were introduced to solid foods, and the correct identification of the signs indicative of the child's readiness to explore new tastes and foods with a new consistency [22].

The results of the study in urban areas found that age at first marriage <20 years was a risk factor for IYCF practice not according to recommendations. At the age of children, the female reproductive organs are physically not well developed and psychologically not ready to give birth to offspring, so they are not ready to provide good parenting. In Indonesia, about 26.95% are married at the age of ≤16 years. The high rate of marriage at a young age will have a huge impact on life and parenting in the family. Mothers of child age and lack of knowledge about their duties and roles as mothers affect the ability of family parenting patterns. The impact of marriage at a young age will cause problems in the household, such as quarrels, squabbles, and clashes between husband and wife. Unstable emotions allow many quarrels in the family that are at risk of divorce [23]. Married mothers aged

>19 years enter adulthood so that their way of thinking will be more mature and more ready to get married and play a role as parents in caring for babies, especially breastfeeding through correct breastfeeding techniques [24].

The results of research in East Nusa Tenggara Province found that poverty was the dominant factor in inaccurate IYCF practice. Families with the poorest socioeconomic are at risk more than five times (OR 95% CI: 5.667:1.059–30.308), the IYCF practice is not according to the recommendations [15]. The wealth quintile is an important determinant of child-feeding practices in Nepal [25]. The results of this study found that socioeconomic is related to IYCF practice because the lower the socioeconomic, the higher the risk of IYCF practice not according to recommendations. Families in the rich category (43.7%) practice IYCF according to the recommendations. Socioeconomic status affects the mother's ability to consume varied and sufficient foods that can produce sufficient breast milk for the infant [26]. Providing complementary foods with a variety of foods is associated with average monthly family income and duration of food sufficiency [27]. Household socioeconomic status (wealth index, food security status, and household income) and child age were found to be among the actors statistically significantly associated with complementary feeding practices indicators [28]. Complementary feeding education for caregivers can also be used to improve nutrition outcomes among infants in both food-secure and -insecure populations [29]. The factors related to the earlier introduction of complementary feeding were lower education level (in Poland and Austria primary and vocational respectively), preterm birth, never breastfeeding, and receiving an infant formula after hospital discharge at maternal age [30]. Socioeconomic factors are factors related to the family's financial condition to meet the needs of purchasing various foodstuffs so that the consumption of various foods is lower and according to recommendations. The better the family's economy, the easier it will be to buy additional food. The family's ability to meet food needs, both in quantity and nutritional quality, greatly influences nutritional status. A high level of family income is closely related to the availability and sufficient food to fulfill family nutrition. Families who have high incomes will be able to meet all the needs of their families.

Low maternal education in rural areas as a risk factor for IYCF practice does not match the recommendations. Mother's education is very influential in the mother's knowledge and understanding in the practice of IYCF or parenting of children, if a mother has low education or just graduated from elementary school, she has not fully received further information or experience about IYCF, she is only IYCF who does not comply with the recommendations. In line with various research results that prove that maternal education is related to the provision of exclusive breastfeeding IBF [25, 26] and the provision of complementary feeding [31]. Mothers with higher education levels will be motivated to give exclusive breastfeeding [32]. Mothers with upper secondary education will be good in the practice of giving complementary feeding [31]. The practice of giving proper complementary feeding is still low and is associated with low levels of education [33]. Maternal education is

positively related to children's dietary diversity [34]. Maternal education and mode of feeding were associated with maternal feeding styles and practices over time [35]. A good mother's education and knowledge will increase the mother's ability to take care of her child. Children born to mothers with good education and knowledge will allow children to grow and develop optimally. A mother's level of knowledge about nutritious food and its practice is related to the level of education and sources of health information [36]. Raising healthy children is not enough with mere affection instincts, mothers need good knowledge and skills. Increased knowledge and ability in parenting is very important and must be obtained through formal education, as well as information from various media to increase the ability of mothers to take care of their children [23]. Increasing the level of education will make it easier for a person to receive information, including nutrition and health information to increase knowledge of nutrition and health which in turn will lead to positive traits in the health sector [37]. Low levels of education will be stronger in maintaining traditions related to food so it is difficult to receive new information in the field of nutrition. A high level of formal education can indeed form progressive values in a person, including the importance of good complementary feeding for infants [38].

The results showed that the quantity and quality of ANC in rural areas were related to the practice of IYCF. The practice of prenatal screening in Indonesia varies greatly between regions of Indonesia. Women in the Nusa Tenggara have 4.365 times (95% CI: 3.229–5.899), women in Java–Bali have 3.607 times (95% CI: 2.741–4.746), women in Sumatra have 1.370 times (95% CI: 1.066–1.761), women in Kalimantan have 2.232 times (95% CI: 1.664–2.994), and women in Sulawesi have 1.980 times (95% CI: 1.523–2.574) the chance of making more than four ANC visits compared to those in the Papua region [39]. The results of this study also show that there are differences in pregnancy screening practices in Indonesia varying according to urban and rural areas (Table 2).

The results of this study are in line with the results of a study in Semarang, Indonesia, which found that the frequency of ANC was significantly related to exclusive breastfeeding [40], having had information about breastfeeding during ANC and postnatal care follow-up. Likewise, research results in East Nusa Tenggara show that the quality of ANC is also a determining factor for the success of IYCF practices [15]. Antenatal visits are an important factor in the success of IYCF practice in Nepal [31]. Likewise, the results of a study in India found that the frequency of ANC visits (≥4 times) was associated with child-feeding practices [6]. The results of the study in Ethiopia also showed that the use of maternity services was related to the dietary diversity of children 6–23 months [8]. If a mother performs ANC relatively early in her pregnancy, she is more likely to receive the recommended services than a mother who receives ANC after 4 or 5 months of gestation. This indicates that providing knowledge about the need for early ANC examinations is likely to increase the mother's chances of getting knowledge of recommended care. The reason women delay ANC is that they are not informed about when to have an ANC visiting Indonesia, the quantity of ANC that meets the standards in urban (79%) and rural

areas (66.4%) has not yet reached the national target (95%). Compared to other countries, ANC coverage in Ethiopia is higher at 77.7% [41], while in Malaysia it is 78.0% [42] but lower in India (51.6%) [43]. The reasons for the inadequate use of services are ignorance, financial constraints, and the unavailability of transportation facilities. Knowledge about the number of ANC visits is still lacking, maternal education is the most consistent and important determinant of the use of maternal and child health services, educated women are more likely to seek higher quality services and have a greater ability to provide better health care [44]. Research in India found that mothers who frequently visited ANC were more likely to introduce complementary feeding to their babies compared to mothers who did not visit ANC [6]. Mothers who make ANC visits according to standards will get information about food intake and lifestyle that will improve the health of the mother and fetus and will detect early possible complications of pregnancy and childbirth so that early action can be taken to prevent possible maternal and infant mortality [45]. Regular prenatal care will prepare for the physical and mental condition of pregnant women, as well as prevent maternal and infant mortality from pregnancy to birth, preparation for EBI, newborn care, and exclusive breastfeeding [46]. Health services obtained by pregnant women during health checks will have an impact on increasing maternal knowledge. Providing counseling on the signs and dangers of pregnancy for pregnant women will change the knowledge of pregnant women to be good, thereby changing the attitude of pregnant women to be positive in recognizing and detecting early pregnancy danger signs [47]. Research in Nepal shows that the frequency of ANC visits is more than four times and delivery at a health facility is associated with breastfeeding, other factors related to infant and child feeding are maternal age, mother's education, occupation, parity, and postnatal care. All risk factors in urban and rural Indonesia that are associated with IYCF practices should be carefully considered when designing strategies and interventions.

6. Conclusion

The practice of IYCF in Indonesia according to recommendations is still low. In urban areas, the risk factors associated with the practice of IYCF are family: socioeconomic, the mother's age at first marriage, and the mother's age when having children. In rural areas, risk factors related to the practice of IYCF are family: socioeconomic, maternal education, quality, and quantity of ANC.

7. Recommendation

The priority of IYCF intervention through education and assistance to pregnant women needs to be a sustainable program. Improving the IYCF facilitator training program for health workers of community health centers and integrated service posthealth cadres that are evenly distributed throughout Indonesia so that they can provide education and assistance to mothers during pregnancy check-ups. The quality and quantity of prenatal care according to standards need to be improved so that mothers get correct information about the practice of IYCF. It is necessary to increase communication, information, and education activities for poor families, young mothers, and low education.

Abbreviations

ANC: Antenatal care
AR: According to the recommendation
EBI: Early breastfeeding initiation
ICF: International Classification of Functioning
IDHS: Indonesia Demographic and Health Survey
IYCF: Infants and young child feeding
LBW: Low birth weight
NAR: Not according to recommendation.

Data Availability

Datasets will be available upon request.

Additional Points

Limitations. The limitation of this study is the availability of data, the data analyzed depends on the availability of the 2017 IDHS data; however, the data available in the 2017 IDHS are quite large and describe the characteristics of families, mothers, and children in Indonesia. The results of this analysis describe the condition of IYCF in Indonesia about 5 years ago (2012–2017), which may vary under current conditions. However, the results of several studies show that the practice of IMD, exclusive breastfeeding, and complementary feeding in Indonesia has not changed significantly; so, the results of this study are still very relevant to be generalized to current conditions. For further researchers, it is necessary to analyze how the influence of IYCF practices on nutritional status in children, and whether there are differences in nutritional status between children in urban and rural areas as a result of differences in IYCF practices. It is also necessary to conduct qualitative research, on whether there is an influence of eating culture on IYCF in urban and rural areas.

Ethical Approval

Although this study used IDHS 2017 secondary data which has received ethical approval from the International Classification of Functioning (ICF) Institutional Review Board *Supplementary 2*. However, the research protocol for further analysis of secondary data was carried out by the principles of research ethics. The approval of the Health Research Ethics Commission from the Bengkulu Ministry of Health Poltekkes was obtained before the researchers carried out the stages of obtaining research permits, data collection, data processing and analysis, and preparation of research reports and manuscripts *Supplementary 3*.

Consent

The authors obtained written consent from all participants. Analysis was conducted on anonymized data.

Disclosure

The Bengkulu Ministry of Health Polytechnic did not contribute to research planning, collection, processing, analysis, and interpretation of data, drawing conclusions, and writing manuscripts. Researchers have obtained permission to use the IDHS data for this study through the following website: https://dhsprogram.com/data/new-user-registration.cfm Supplementary 1.

Conflicts of Interest

All authors declare that there are no conflicts of interest regarding the publication of this paper.

Authors' Contributions

Demsa Simbolon contributed to conceptualization, data curation, formal analysis, funding acquisition, investigation, methodology, resources, software, visualization, writing—original draft, writing—review, and editing. Desri Suryani contributed to project administration, resources, writing—original draft, and writing—review and editing. Heidy Dayanti contributed to data curation, formal analysis, funding acquisition, methodology, and project administration. Agustina Setia and Tobianus Hasan contributed to project administration, investigation, and visualization.

Acknowledgments

Supplementary Materials

Supplementary 1. The 2017 IDHS Questionnaire (file 3: QUESTIONNAIRE_IDHS FR342) [2]. File 3 contains an attachment to the research questionnaire used for IDHS 2017 data collection. The consideration of 2017 Indonesian Health Demographic Survey (IDHS) has a research ethics review by the ICF Institutional Review Board (International Classification of Functioning) with ICF Project Number 132989.0.00. Further analysis of the IDHS data received ethical approval from the Health Research Ethics Commission of the Bengkulu Ministry of Health Poltekkes. Ethical clearance number KEPK.M/151/09/2021. Mothers who had a 2-year-old child as respondents had given written consent by signing a form for their involvement in the study. For the analysis in this study, respondents' identities were all removed from the dataset.

Supplementary 2. A complete list of documents used for document review has been provided in supplementary material. Supplementary Material consists of the Approval of Ethics for conducting research (file 1). File 1 (EC IDHS 2017) is the ethical approval from the Health Research Ethics Commission of the Bengkulu Ministry of Health Poltekkes. Ethical clearance number KEPK.M/151/09/2021. Mothers who had a 2-year-old child as respondents had given written consent by signing a form for their involvement in the study. For the analysis in this study, respondents' identities were all removed from the dataset.

Supplementary 3. Approval of Ethics for Implementation of the 2017 IDHS (file 2). File 2 (EC PDUPT 2021) is the ethical approval Ethical clearance was obtained in the 2017 IDHS from the National Ethics Committee. The consideration of 2017 Indonesian Health Demographic Survey (IDHS) has a research ethics review by the ICF Institutional Review Board (International Classification of Functioning) with ICF Project Number 132989.0.00. The respondents' identities have all been deleted from the dataset. Respondents provided written approval for their involvement in the study. The survey uses informed consent during data collection, which pays attention to aspects of data collection procedures, voluntary and confidentiality. Respondents gave written consent.

References

[1] National Population and Family Planning Board, Central Statistics Agency, "Survei demografi dan kesehatan Indonesia 2017," Indonesian Ministry of Health, AUSAID, Jakarta: CSA, 2017.

[2] F. C. Powell, C. V. Farrow, and C. Meyer, "Food avoidance in children: the influence of maternal feeding practices and behaviors," *Food Avoidance Eating Behaviors in Children*, vol. 57, no. 3, pp. 683–692, 2011.

[3] WHO, "Global nutrition targets 2025: policy brief series," 2014, Geneva, https://www.who.int/teams/nutrition-and-food-safety/global-targets-2025.

[4] C. P. Stewart, L. Iannotti, K. G. Dewey, K. F. Michaelsen, and A. W. Onyango, "Contextualizing complementary feeding in a broader framework for stunting prevention," *Maternal & Child Nutrition*, vol. 9, no. S2, pp. 27–45, 2013.

[5] WHO, "Complementary feeding," 2017, https://www.who.int/health-topics/complementary-feeding#tab=tab_1.

[6] M. V. Dhami, F. A. Ogbo, U. L. Osuagwu, and K. E. Agho, "Prevalence and factors associated with complementary feeding practices among children aged 6–23 months in India: a regional analysis," *BMC Public Health*, vol. 19, no. 1, pp. 1–16, 2019.

[7] A. Tadesse, "Predictors of infant and young feeding practices among children 6–23 months old in Bennatsemayworeda, Ethiopia," *Journal of Nutritional Health & Food Engineering*, vol. 8, no. 6, pp. 7–16, 2018.

[8] H. Temesgen, T. Yeneabat, and M. Teshome, "Dietary diversity and associated factors among children aged 6–23 months in Sinan Woreda, Northwest Ethiopia: a cross-sectional study," *BMC Nutrition*, vol. 4, no. 1, pp. 1–8, 2018.

[9] A. Karnila and K. Bantas, "Hubungan wilayah tempat tinggal dengan pemberian ASI ekslusif pada anak 0–5 bulan di Indonesia (analisis data survei demografi kesehatan Indonesia) tahun 2017," *Jurnal Epidemiologi Kesehatan Indonesia*, vol. 3, no. 2, pp. 49–54, 2019.

[10] T. Beal, A. Tumilowicz, A. Sutrisna, D. Izwardy, and L. M. Neufeld, "A review of child stunting determinants in Indonesia," *Maternal & Child Nutrition*, vol. 14, no. 4, pp. 1–10, 2018.

[11] I. R. Irawan, S. Sudikno, J. E. Diana, N. Nurhidayati, R. Rachmawati, and S. Y. Diana, "Risk factors of underweight under-five children in urban and rural indonesia [data analysis of the study on nutritional status of Indonesian under-five child 2019," *Journal of Food and Nutrition Research*, vol. 45, no. 1, pp. 47–58, 2022.

[12] V. Ucianna, A. Pramono, A. Margawati, and A. Syauqy, "Differences in stunting risk factors in urban and rural areas in children aged 6–23 months in Indonesia: analysis of riskesdas data," *Journal of Nutrition College*, vol. 12, no. 1, pp. 27–32, 2023.

[13] Widodo Y. Sudikno, I. R. Irawan, D. Izwardy, V. Setiawaty, and B. Setyawati, "Sociodemography of stunting among children under-five year in Indonesia," *Penelitian Gizi dan Makanan (The Journal of Nutrition and Food Research)*, vol. 44, no. 2, pp. 71–78, 2021.

[14] P. Lestari, S. Susetyowati, and M. N. Sitaresmi, "Differences in food intake among children under five years in urban and rural areas in provinces with double burden of malnutrition," *Jurnal Gizi Klinik Indonesia*, vol. 17, no. 2, pp. 79–86, 2020.

[15] D. Simbolon, D. Suryani, H. Damayanti, A. Setia, and T. Hasan, "Poverty dominant factor problems in infant and young child feeding practices in East Nusa Tenggara, Indonesia," *International Journal of Innovative Research and Development*, vol. 11, no. 3, pp. 58–65, 2022.

[16] Z. K. Nantabah, Z. A. A, and A. D. Laksono, "Overview of health services access for toddlers in Indonesia," *Buletin Penelitian Sistem Kesehatan*, vol. 22, no. 1, pp. 54–61, 2019.

[17] L. C. Smith, M. T. Ruel, and A. Ndiaye, "Why is child malnutrition lower in urban than in rural areas? Evidence from 36 developing countries," *World Development*, vol. 33, no. 8, pp. 1285–1305, 2005.

[18] R. Kemenkes, *Pedoman Pelatihan Pelatih Konseling Pemberian Makan Bayi dan Anak (PMBA)*, Kementrian Kesehatan Republik Indonesia, Jakarta, 2019.

[19] G. G. Mekebo, A. S. Argawu, H. T. Likassa et al., "Factors influencing exclusive breastfeeding practice among under-six months infants in Ethiopia," *BMC Pregnancy and Childbirth*, vol. 22, no. 1, pp. 1–10, 2022.

[20] S. A. Hanifah, S. Astuti, and A. I. Susanti, "Gambaran karakteristik ibu menyusui tidak memberikan asi eksklusif di desa cikeruh kecamatan jatinangor kabupaten sumedang tahun 2015," *Jurnal Sistem Kesehatan*, vol. 3, no. 1, pp. 38–43, 2017.

[21] L. Shaker-Berbari, V. Qahoush Tyler, C. Akik, Z. Jamaluddine, and H. Ghattas, "Predictors of complementary feeding practices among children aged 6–23 months in five countries in the middle East and north Africa region," *Maternal & Child Nutrition*, vol. 17, no. 4, pp. 1–27, 2021.

[22] M. Kostecka, I. Jackowska, and J. Kostecka, "Factors affecting complementary feeding of infants. A pilot study was conducted after the introduction of new infant feeding guidelines in Poland," *Nutrients*, vol. 13, no. 1, pp. 1–13, 2021.

[23] I. J. Loppies and L. E. Nurrokhmah, "Dampak perkawinan usia muda terhadap perkembangan pola asuh keluarga pada kampung inggiri distrik biak kota kabupaten biak numfor," *Gema Kampus IISIP YAPIS Biak*, vol. 15, no. 2, pp. 51–63, 2020.

[24] E. Rinata and D. Iflahah, "Teknik menyusui yang benar ditinjau dari usia ibu, paritas, usia gestasi dan berat badan lahir di RSUD sidoarjo," *Midwiferia*, vol. 1, no. 1, pp. 51–59, 2016.

[25] D. Acharya, J. K. Singh, R. Kandel, J.-H. Park, S.-J. Yoo, and K. Lee, "Maternal factors and the utilization of maternal care services associated with infant feeding practices among mothers in rural southern Nepal," *International Journal of Environmental Research and Public Health*, vol. 16, no. 11, pp. 1–15, 2019.

[26] Mirawati and N. W. W. Asthiningsih, "Hubungan status sosial ekonomi dan dukungan keluarga dengan pemberian ASI eksklusif pada bayi usia 6–12 Bulan," *Borneo Student Research*, vol. 2, no. 2, pp. 887–894, 2021.

[27] N. Subedi, S. Paudel, T. Rana, and A. K. Poudyal, "Infant and young child feeding practices in Chepang communities," *Journal of Nepal Health Research Council*, vol. 10, no. 21, pp. 141–146, 2012.

[28] J. A. Ahmed, K. K. Sadeta, and K. H. Lembo, "Complementary feeding practices and household food insecurity status of children aged 6–23 months in Shashemene city west Arsi zone," *Nursing Research and Practice*, vol. 2022, Article ID 9387031, 14 pages, 2022.

[29] L. Harrison, Z. Padhani, R. Salam, C. Oh, K. Rahim, and M. Maqsood, "Dietary strategies for complementary feeding between 6 and 24 months of age: the evidence," *Nutrients*, vol. 15, no. 13, Article ID 3041, 2023.

[30] M. A. Zielinska, P. Rust, D. Masztalerz-Kozubek, J. Bichler, and J. Hamułka, "Factors influencing the age of complementary feeding—a cross-sectional study from two European countries," *International Journal of Environmental Research and Public Health*, vol. 16, no. 20, pp. 1–18, 2019.

[31] M. Adhikari, V. Khanal, R. Karkee, and T. Gavidia, "Factors associated with early initiation of breastfeeding among Nepalese mothers: further analysis of Nepal Demographic and Health Survey, 2011," *International Breastfeeding Journal*, vol. 9, no. 1, pp. 1–9, 2014.

[32] H. Assriyah, R. Indriasari, H. Hidayanti, A. R. Thaha, and N. Jafar, "Relations of knowledge, attitude, age, education, jobs, psychological, and early asking initiations with exclusive assessment in Sudiang Puskesmas," *Jurnal Gizi Masyarakat Indonesia: The Journal of Indonesian Community Nutrition*, vol. 9, no. 1, pp. 30–38, 2020.

[33] F. A. Olatona, J. O. Adenihun, S. A. Aderibigbe, and O. F. Adeniyi, "Complementary feeding knowledge, practices, and dietary diversity among mothers of under-five children in an urban community in Lagos state, Nigeria," *International Journal of Maternal and Child Health and AIDS (IJMA)*, vol. 6, no. 1, pp. 46–59, 2017.

[34] A. Reinbott and I. Jordan, "Determinants of child malnutrition and infant and young child feeding approaches in Cambodia," *World Review of Nutrition and Dietetics*, vol. 115, pp. 61–67, 2016.

[35] C. Helle, E. R. Hillesund, and N. C. Øverby, "Associations between infant and maternal characteristics were measured at the child's age of 5 months and maternal feeding styles and practices up to the child's age of 2 years," *PLoS One*, vol. 17, pp. 1–19, 2022.

[36] T. Tasnim, L. Mwanri, and G. Dasvarma, "Mother's child feeding knowledge and practices associated with underweight in children under-five years: a study from rural Konawe, Indonesia," *Public Health of Indonesia*, vol. 4, no. 1, pp. 9–18, 2018.

[37] P. Swandari, O. W. K. Handayani, and S. B. Mukarromah, "Karakteristik ibu dalam pemberian makanan pendamping ASI (MPASI) dini terhadap status gizi balita usia 6-24 bulan di wilayah kerja puskesmas umbulharjo i kota yogyakarta tahun 2017," *Public Heal Perspect Journal*, vol. 2, no. 3, pp. 191–201, 2017.

[38] W. S. Karakteristik and K. Hubungan, "Pengetahuan dan sikap ibu dengan pemberian MP-ASI pada bayi di wilayah kerja puskesmas siantan tengah," *Jurnal Mahasiswa PSPD FK Universitas Tanjungpura*, vol. 3, no. 1, pp. 1–8, 2013.

[39] A. D. Laksono, R. Rukmini, R. D. Wulandari, and S. A. Woreta, "Regional disparities in antenatal care utilization in Indonesia," *PLOS ONE*, vol. 15, no. 2, Article ID e0224006, 2020.

[40] C. E. Agustina, "The relationship of frequency antenatal care, counseling lactation with exclusive breastfeeding in Sambi Rejo Semarang District," Salatiga, 2016.

[41] A. Tariku, K. Alemu, Z. Gizaw et al., "Mothers' education and ANC visit improved exclusive breastfeeding in dabat health and demographic surveillance system site, northwest Ethiopia," *PLOS ONE*, vol. 12, no. 6, Article ID e0179056, 2017.

[42] T. A. Keya, K. Fernandez, K. C. Kharkwal, and N. Habib, "Impact of antenatal care on pregnancy outcomes: A cross-sectional study in a rural community in Malaysia," *Medical Journal of Dr. D.Y. Patil Vidyapeeth*, vol. 14, no. 2, pp. 172–179, 2021.

[43] G. Kumar, T. S. Choudhary, A. Srivastava, R. P. Upadhyay, S. Taneja, and R. Bahl, "Utilization, equity, and determinants of full antenatal care in India: analysis from the national family health survey 4," *BMC Pregnancy and Childbirth*, vol. 19, no. 1, Article ID 327, 2019.

[44] J.-W. Noh, Y.-M. Kim, L. J. Lee et al., "Factors associated with the use of antenatal care in Sindh province, Pakistan: a population-based study," *PLOS ONE*, vol. 14, no. 4, Article ID e0213987, 2019.

[45] V. Z. Kuuire, J. Kangmennaang, K. N. Atuoye, R. Antabe, S. A. Boamah, and S. Vercillo, "Timing and utilization of antenatal care service in Nigeria and Malawi," *Global Public Health*, vol. 3, no. 6, pp. 711–727, 2017.

[46] V. J. R. Lumempouw, R. M. Kundre, and Y. Bataha, "Hubungan faktor sosial ekonomi ibu hamil dengan keteraturan pemeriksaan antental care (ANC)dDi puskesmas ranotana weru kecamatan wanea kota manado," *Jurnal Keperawatan UNSRAT*, vol. 4, no. 2, pp. 1–7, 2016.

[47] Y. Eppang, "Pengaruh konseling saat antenatal care (ANC) terhadap pengetahuan dan sikap ibu hamil tentang tanda-tanda bahaya kehamilan di wilayah kerja puskesmas kapasa," *Jurnal Keperawatan Muhammadiyah*, vol. 5, no. 2, pp. 254–264, 2020.