Preferred child number as the primary determinant of higher parity in women aged 45-49 in Eastern Indonesia: the 2017 IDHS data analysis

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Abstract

Purpose: This research aims to determine the determinants of higher parity in women aged 45-49 years in Eastern Indonesia. **Methods:** This research uses a quantitative approach and analysis of secondary data from the 2017 IDHS, utilizing a cross-sectional study design. Meanwhile, this research was conducted on 1,055 samples of the 2017 IDHS and analyzed using a complex survey method. **Results:** The research finds that 72.2% of women aged 45-49 years in Eastern Indonesia have higher parity. Multiple logistic regression analysis indicates that women in this age group who gave birth for the first time before the age of 20 (p-value: 0.005; aOR: 2.04), those who have used a birth control method or device (p-value: 0.001; aOR: 0.30), those with the lowest welfare index (p-value: 0.015; aOR: 1.90), those who have experienced child mortality (p-value: 0.001; aOR: 4.46), and those preferred more than two children (p-value: 0.001; aOR: 5.47) are statistically significant related to higher parity. **Conclusion:** The research concludes that key determinants of higher parity in women aged 45-49 years in Eastern Indonesia include early age at first birth, previous use of a birth control method or device, lowest welfare index, experience of child mortality, and a preference for having more than two children. Among these, the preferred child number is the most dominant variable related to higher parity.

Keywords: preferred child number; parity; women aged 45-49 years

INTRODUCTION

Problems in the field population are more complex. Indonesia is faced with several problems principally in the field population, such as a relatively high population growth rate with a large population distribution of residents who aren't balanced in each province. The population with married status is still much higher than those with divorced status, and the socio-economic level is still relatively low [1]. The results of the Indonesian Population Census for the

1980-1990 period show that the average population growth rate per year reached 1.98 percent [2]. Then, in the 1990-2000 period, there was a significant decline, namely to 1.44 percent [2]. However, in the 2000-2010 period, there was an increase to 1.49 percent; in the 2010-2020 period, it fell again to 1.25 percent [2]. The fluctuations in the population growth rate are closely related to the influence of fertility, migration, and population mortality [3].

Fertility is an important part of population growth. Fertility is defined as the real reproductive

output (children ever born alive/parity) of a woman or group of women [4]. The number of births born to women of childbearing age (parity) in a region indicates the fertility rate in that region [5]. Fertility measurements are much more complex than mortality measurements. This is because a woman can only experience death once but can give birth to more than one child. Apart from that, a woman who dies on a certain date and time means that from that moment on, she is no longer at risk of dying. Meanwhile, just because a woman has given birth to a child does not mean that her risk of giving birth in the future has decreased [4]. The complexity of measuring fertility is because it involves two people, or a husband and wife, unlike mortality, which only involves one person who dies [6].

The indicator of the average number of children born alive in women aged 45-49 years can obtain information regarding complete family size [7]. This is in line with what is explained by National Statistics, that to get a true picture of complete family size, it would be more useful to look at actual complete fertility in women aged 45 years and over [8].

There are several well-known theoretical concepts regarding factors related to fertility. Davis and Blake, who conducted a social analysis related to fertility, explained that there are eleven intermediate variables that influence fertility (parity), where each variable is grouped into three stages of the reproductive process [9]. First, the sexual intercourse stage consists of the variables age when starting sexual relations, permanent celibacy, the length of time the woman has been married, voluntary abstinence, forced abstinence, and frequency of sexual intercourse. Second, the conception stage consists of unintentional fecundity or in fecundity, intentional fecundity or infecundity (sterilization, subincision, medical treatment), and use of birth control methods/devices variables. Third, the gestation stage consists of spontaneous abortion and induced abortion variables [9].

Then, Freedman explains that the intermediate variable proposed by Davis and Blake is the setting of "fertility norms" recognized by society, with the result of the number of children they have [10]. Social norms that develop in society can play a role in influencing intermediate variables, which in turn can influence the number of children born alive. So, in the end, a person's behavior will be influenced by existing norms [6].

Based on data from the Central Bureau of Statistics, the average annual population growth rate (2010-2020 period) in several provinces is still quite high and exceeds the national average (1.25 percent) [11], especially in Eastern Indonesia. Based on Presidential Regulation Number 18 of 2020 concerning the 2020-2024 RPJMN, Eastern Indonesia includes the regions of Kalimantan, Nusa Tenggara, Sulawesi, Maluku, and Papua [12]. Therefore, there are 17 provinces in Eastern Indonesia, consisting of (1) Central Kalimantan; (2) West Kalimantan; (3) East Kalimantan; (4) North Kalimantan; (5) South Kalimantan; (6) East Nusa Tenggara; (7) West Nusa Tenggara; (8) Central Sulawesi; (9) West Sulawesi; (10) North Sulawesi; (11) South Sulawesi; (12) Gorontalo; (13) Southeast Sulawesi; (14) Maluku; (15) North Maluku; (16) Papua; (17) West Papua.

One of the reasons for the still high average population growth rate in Eastern Indonesia is that the fertility rate in this region is also still high (exceeding the national average Total Fertility Rate and Live Birth Rate). Therefore, fertility in Eastern Indonesia needs special attention to reduce the TFR to reach the replacement rate level (2.1). To reduce fertility levels in an area, it is necessary to know the determinants of higher parity in women in that area, especially in the group of women aged 45 years and over. The total number of women's average children born alive at the end of the reproductive period (age 45-49 years) will provide information regarding complete family size. Therefore, this research aims to determine the determinants of higher parity in Eastern Indonesia's women aged 45-49 years.

METHODS

This study uses a quantitative approach and secondary data analysis, namely, the 2017 IDHS, with a cross-sectional study design. The location of this study is in Eastern Indonesia. Research activities started from conducting literature reviews to data analysis and interpretation activities, which were carried out from May 2023 to September 2023. The population of this study was all women of childbearing age in Eastern Indonesia. Then, the sample for this research is all women aged 45-49 years in Eastern Indonesia who are respondents to the 2017 IDHS and meet the following inclusion criteria: 1) Women aged 45-49 years who live/domiciled in provinces in Eastern Indonesia at the time of the survey; 2) Women who have ever been married or lived together with a husband or partner. Then, women who meet the inclusion criteria will be excluded from the sample if they meet the exclusion criteria: 1) women who have never given birth to a living child; 2) women who provide incomplete information (missing).

Researchers select samples from the available population according to predetermined inclusion and exclusion criteria. The samples in this study amounted to 1,055 samples. The 2017 IDHS uses a stratified, two-stage sampling technique [13]. The first stage is stratifying the 2017 sample according to province. For each district in the province, several census blocks were selected using probability proportional to size sampling, with the total number of households as a result of the 2010 Population Survey list. Then, implicit stratification was carried out by sorting the census blocks one by one according to residential area, as well as the welfare index [13]. Then, in the second stage, namely, for each selected census block, 25 households were selected in a systematic way [13]. In each household, all household members who are female and aged 15-49 years will be selected to be the sample of women of childbearing age [13]. The 2017 IDHS data was taken using an interview questionnaire. The questionnaire consists of the household questionnaire, the women of childbearing age questionnaire, the married men questionnaire, and the young men questionnaire [13]. the questionnaires used in this research are the household questionnaire and the women of childbearing age questionnaire.

This study is aimed at variables related to t higher parity based on availability in the 2017 IDHS data. Researchers used dependent variables, namely, the higher parity, and independent variables, which include age at first marriage, age at first birth, use of birth control methods/devices, miscarriage/abortion, place of residence, education level, employment status, welfare index, child mortality, and preferred child number.

Data analysis in this study uses statistical applications with the complex samples analysis menu. Before analyzing, the first thing to do is create a CS Analysis Plan by entering strata, cluster, and sample weight normalization variables. The types of analysis used are univariate, bivariate, and multivariable analysis. Univariate analysis was used to see a picture of the frequency distribution and proportions of all the variables studied. Then, using the Chi-square test, bivariate analysis is used to determine the statistical relationship between the independent and dependent variables. Next, multivariable analysis is used to determine the influence or relationship of an independent variable on several dependent variables [14]. The multiple logistic regression test to analyze the influence or relationship of one or more categorical independent variables with one categorical dependent variable in two groups [14]. Then, this test uses a determinant

analysis model, which contains several of the best independent variables that can predict the occurrence of the dependent variable [14].

The data obtained by researchers is only used for this research and has gone through the registration process on the DHS Program website. Then, this study is a study with secondary data analysis. Therefore, there is no need for ethical approval in this study.

RESULTS

Table 1 shows the characteristics of 1,055 women aged 45-49 years in Eastern Indonesia. Most respondents had more than two children. 51.1% of respondents married before age 20, while 37% gave birth for the first time when they were under 20 years old. The majority of respondents utilized a birth control method or device to prevent or delay pregnancies and had no history of miscarriage or abortion. Approximately 67.2% of respondents reside in rural areas. The educational distribution includes 10.5% with higher education, 36.8% with secondary education, 44.2% with primary education, and 8.5% with no formal schooling. In addition, 35.9% of respondents are in the lowest welfare index segment. Many respondents are employed, have not experienced child mortality, and prefer more than two children.

Table 1. Characteristics of respondents (n=1,055)

Variables		%
Higher Parity	≤ 2 Children	27.8
	> 2 Children	72.2
Age at first marriage	≥ 20 years	48.9
	< 20 Years	51.1
Age at first birth	≥ 20 years	63.0
	< 20 Years	37.0
Usage birth control method/device	Ever	83.8
	Never	16.2
Miscarriage/abortion	Never	76.4
	Ever	23.6
Residences	Urban	32.8
	Rural	67.2
Education level	Tertiary	10.5
	Secondary	36.8
	Primary	44.2
	No schooling	8.5
Job-status	Work	71.3
	Doesn't work	28.7
Welfare index	Highest	11.8
	Upper middle	15.1
	Middle	15.7
	Lower Middle	21.5
	Lowest	35.9
Child mortality	Never	70.7
	Ever	29.3
Preferred child number	≤ 2 Children	35.8
	> 2 Children	64.2

Table 2. Relationship between variable independent with variable dependent on women aged 45-49 years in Eastern Indonesia in 2017

Variable Independent		Higher Parity						OR (95% CI)	P-Value
		≤ 2 Children		> 2 Children		Total			
		n	%	n	%	n	%		
Age at first marriage	≥ 20 Years	194	37.6	322	62.4	516	100	1*	0.001
	< 20 Years	99	18.4	440	81.6	539	100	2,676 (2,074-3,452)	
Age at first birth	≥ 20 Years	235	35.4	429	64.6	664	100	1*	0.001
	< 20 Years	58	14.8	333	85.2	391	100	3,163 (2,397-4,174)	
Usage birth control method/device	Ever	227	25.6	657	74.4	884	100	1*	0.001
	Never	66	38.8	105	61.2	171	100	0.543 (0.404-0.730)	
Miscarriage/abortion	Never	229	28.4	577	71.6	806	100	1*	0.338
	Ever	64	25.7	185	74.3	249	100	1,147 (0.865-1.520)	
Residences	Urban	117	33.8	230	66.2	347	100	1*	0.001
	Rural	176	24.8	532	75.2	708	100	1,544 (1,192-2,001)	
Education level	Tertiary	45	40.3	66	59.7	111	100	1*	0.001
	Secondary	127	32.9	261	67.1	388	100	1,382 (0.944-2.022)	
	Primary	103	22.1	364	77.9	467	100	2,396 (1,606-3,573)	
	No schooling	18	20.1	71	79.9	89	100	2,686 (1,490-4,862)	
Job-status	Work	208	27.6	545	72.4	753	100	1*	0.815
	Doesn't work	85	28.2	217	71.8	302	100	0.970 (0.753-1.250)	
Welfare index	Highest	49	39.0	76	61.0	125	100	1*	0.001
	Upper middle	60	37.3	100	62.7	160	100	1.072 (0.714-1.611)	
	Middle	53	32.1	112	67.9	165	100	1,351 (0.888-2.055)	
	Lower Middle	60	26.7	166	73.3	226	100	1,753 (1,162-2,646)	
	Lowest	71	18.8	308	81.2	379	100	2,753 (1,886-4,019)	
Child mortality	Never	265	35.5	481	64.5	746	100	1*	0.001
	Ever	28	9.1	281	90.9	309	100	5,575 (3,768-8,248)	
Prefereed child number	≤ 2 Children	192	50.9	186	49.1	378	100	1*	0.001
	> 2 Children	101	14.9	576	85.1	677	100	5,849 (4,610-7,423)	

Notes 1* = Reference

Table 2 shows that the factors of miscarriage or abortion and job status are not related to higher parity. However, there is a relationship between age at first marriage, age at first birth, use of birth control method or device, place of residence, education level, welfare index, child mortality, and preferred child number with higher parity (p-value < 0.05). Next, all independent variables were included in logistic regression modeling except for the employment status variable (p-value = 0.815). Even though the miscarriage or abortion variable shows a p-value > 0.25 (0.338), in substance, this variable is important and is included in the direct factors that influence fertility (the number of children born alive).

The results of the multivariable analysis in Table 3 show that the independent variables that are statistically significant related to higher parity in women aged 45-49 years in Eastern Indonesia are age at first birth, use of birth control method or device, welfare index, child mortality, and preferred child number. From the five variables, the preferred child number is the most dominant variable related to higher parity, with aOR=5.47 (95% CI: 3.98 - 7.54), meaning that the respondents who preferred more than two children are 5.5 times more likely to have higher parity than those who preferred two children or less, after being controlled by the variables age at first marriage, age at first birth, use of birth control method/device, welfare index, and child mortality.

Table 3. Multivariable test results

Variable	β	p-value	aOR	95%CI
Age at first marriage				
≥ 20 years			1*	
< 20 years	0.41	0.069	1.50	0.97-2.33
Age at first birth				
≥ 20 years			1*	
< 20 years	0.71	0.005	2.04	1.24-3.34
Usage birth control method/device				
Ever			1*	
Never	-1.20	0.001	0.30	0.20-0.46
Welfare index				
Highest			1*	
Upper middle	-0.05	0.86	0.95	0.55-1.65
Middle	0.11	0.69	1.12	0.64-1.96
Lower Middle	0.19	0.499	1.20	0.70-2.06
Lowest	0.64	0.015	1.90	1.13-3.21
Child mortality				
Never			1*	
Ever	1.50	0.001	4.46	2.83-7.04
Preferred child number				
≤ 2 children			1*	
> 2 children	1.70	0.001	5.47	3.98-7.54
Constant	-0.73	0.001	0.48	

Notes 1* = Reference

The variable "age at first birth" substantially impacts the respondents' parity. Those who experienced their first childbirth before the age of 20 have twice the likelihood of having higher parity compared to those who gave birth at age 20 or older, after being controlled by the variables age at first marriage, use of birth control method or device, welfare index, child mortality, and preferred child number.

When considering the use of birth control methods or devices as a variable, respondents who have never used a birth control method/device are 0.3 times less likely to have higher parity than those who have ever used it after being controlled by the variables age at first marriage, age at first birth, welfare index, child mortality, and preferred child number.

Respondents found at the lowest end of the welfare index are 1.9 times more likely to have higher parity in comparison to those located at the highest end of the welfare index after being controlled by the variables age at first marriage, age at first birth, use of birth control method/device, child mortality, and preferred child number.When examining the child mortality variable, respondents who have experienced child mortality are 4.5 times more likely to have higher parity in comparison to those who have not encountered child mortality after being controlled by the variables age at first marriage, age at first birth, use of birth control method or device, welfare index, child mortality, and preferred child number.

DISCUSSION

Findings from this study indicate that women aged 45-49 years in Eastern Indonesia who entered their first marriage before the age of 20 had a significantly increased probability of having higher parity in comparison to their counterparts in the same age group who married at the age of 20 or older. This result aligns with previous research, which suggests that as the age at first marriage increases, the average number of live births decreases [15]. Therefore, a negative correlation exists between the age at first marriage and the average parity. Conversely, the study revealed that women in the 45-49 age group in Eastern Indonesia who gave birth for the first time at the age of 20 or older were more likely to have a higher parity than those who had their first child before the age of 20. This phenomenon can be attributed to the fact that, in this region, the average age at first marriage is 20.0 years, while the average age at first childbirth is 21.7 years [13].

It is evident from statistical analysis that the age at which women have their first child is significantly associated with higher parity, consistent with previous research [16–18]. The Marriage Age Maturation Program, aimed at establishing a marriageable age of 21 years for women, endeavors to reduce first births among women under the age of 21 [19]. In cases where a woman does not attain the age of her first marriage, the program recommends delaying the birth of her first child. In the realm of Communication, Information, and Education, this approach is akin to advocating the replacement of the traditional honeymoon period with what is figuratively referred to as the "honey year" [16].

Birth control methods are categorized into two groups: modern and traditional. Modern methods encompass birth control pills, IUDs, birth control injections, diaphragms, female surgical methods, female sterilization, lactational amenorrhea, condoms, male surgical methods, male sterilization, and emergency contraception [13]. In contrast, traditional methods include practices such as interrupted intercourse and periodic abstinence [13]. The findings in this study show that women aged 45-49 years in Eastern Indonesia who have higher parity are most often found to be women who have used a birth control method or device. In addition, statistically, the use of a birth control method or device has a significant relationship with higher parity. These findings are in line with previous research in Indonesia [20].

Statistically, miscarriage or abortion does not have a significant relationship with having higher parity. The same as the results of previous research [3]. This means that whether a woman has experienced a miscarriage or abortion or one who has never experienced one, it does not matter if the number of children is more than two. Information develops much faster in urban areas than in rural areas. Similarly, with the availability of information regarding family planning, women in urban areas should be more knowledgeable and familiar with birth control methods/devices, where they will demand better birth control services [16]. However, the findings of this study show that although the proportion of women aged 45–49 years in Eastern Indonesia who have higher parity is highest among women who live in rural areas, both those living in urban and rural areas are equally likely to have higher parity. Statistically, place of residence has a significant relationship with higher parity. Likewise with previous research results [20].

Then, women aged 45-49 years in Eastern Indonesia who have primary education tend to have higher parity compared to women aged 45-49 years who have tertiary, secondary, or no formal schooling. Statistically, the level of education is significantly related to higher parity. Previous researchers explained that education is significantly related to reproductive behavior in developing countries [21]. Similar research results show that education significantly negatively affects parity directly and

indirectly through age at first marriage [18]. Empirical evidence shows that education is associated with reduced parity, increased use of birth control methods/devices, and delayed marriage [21]. In several countries in Sub-Saharan Africa, women who do not attend school have 2-3 times more children than women who have completed secondary school or above [21]. In several countries, including Indonesia, previous researchers found differences between educated women and uneducated women, where highly educated women had fewer children than those with low education [22].

The analysis results show that more women aged 45-49 years who have worked have higher parity than those who do not. Statistically, employment status does not have a significant relationship with higher parity. This result is in line with the results of previous research, which stated that the wife's participation in work does not have a significant influence. This means that whether a wife works or does not work does not influence the number of live-born children she has [3]. Apart from that, other findings say that there is almost no difference in parity between women who do not work and women who work [15]. The problem of the sequence of events as a condition for a causal relationship to occur is not fulfilled because working status reflects the situation at the time of the survey, while fertility (parity) reflects the situation long before the survey.

The lower the respondent's welfare index, the greater the proportion of respondents who have higher parity. The respondents at the bottom of the welfare index tend to have higher parity than those at the lower middle, middle, upper middle, or top welfare index. Then, statistically, the welfare index has a significant relationship with higher parity. The results of this study are in line with the results of previous studies [7,17]. Previous researchers suggested that there was a correlation between fertility and mortality [23]. The high infant and child mortality rate causes families to want to have lots of children so that if a child dies someday, the family will still have children [23]. This study also found that women aged 45-49 years who had higher parity were most often found among women who had never experienced child mortality. Then, statistically, child mortality has a significant relationship with higher parity. The results of this study are in line with previous research; as the number of child deaths increases, the number of children born alive will also increase [17,24].

The high and low parity rates in the future can be described indirectly through estimates of the number of children and the preferred child number. The results of this study show that women aged 45-49 years who have higher parity are most often found among women who preferred child numbers. Statistically, the preferred child number correlates statistically with higher parity. In general, the preferred child number is related to higher parity. When a woman wants to have more children and implements her wish, the woman tends to have many children too, and the woman may even increase the ideal number of children as she has more children [16].

The Head of Representative of BKKBN East Nusa Tenggara Province said that many families still believe that having lots of children means lots of good fortune [25]. Apart from that, cultural factors on children's values also greatly influence the number of children they want to have [26]. In East Nusa Tenggara Province, especially in the Sumbanese people, the term 'belis' encourages every couple to want children of both genders and the same number [26]. They won't feel complete if they don't have a daughter, so they will keep trying until they get one. 'Belis' has metaphysical, physical, and social prestige meaning [27]. 'Belis' is an obligation to pay or give a dowry to the woman's family, which can be in the form of livestock or objects, such as gold, silver, and woven cloth, before marriage [27]. Therefore, 'belis' is a very important aspect for the Sumbanese people. On the other hand, these customs or beliefs make men and their families feel like they have great authority in the family and tend to dominate in all family matters, including determining the preferred child number [27].

Limitations in this research are that not all variables in fertility theory are available in the 2017 IDHS data or do not meet the needs of this research, such as variables related to environmental factors (family planning programs), such as visits by family planning field officers and exposure to family planning through various media, does not meet research needs, where questions regarding these variables in the 2017 IDHS questionnaire use a period of six months before the survey so they are not suitable for respondents (women aged 45-49 years) in this study.

CONCLUSION

Several determinants exhibit a statistically significant relationship with higher parity in Eastern Indonesia. These include early age at first birth (below 20 years), previous use of a birth control method or device, lowest welfare index, experience of child mortality, and a preference for having more

than two children. Among these, the preferred child number is the most dominant variable related to higher parity.

Health program managers are encouraged to develop comprehensive strategies to support the government's efforts in reducing fertility rates, especially in Eastern Indonesia. One such strategy involves implementing youth-focused information and counseling programs through institutions like Youth Information and Counseling Centers 'PIK-R' in educational and community settings. These programs aim to enhance the younger generation's understanding and knowledge of family planning. Key objectives include promoting delayed marriage, planning desired family sizes, and imparting knowledge about birth control methods and devices from an early age. By preventing early marriages and childbirth, as well as reducing maternal and child mortality rates, these initiatives can contribute to lowering fertility rates. Empowering the next generation with these insights is essential for shaping ideal family planning practices and a brighter future.

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