

Traditional Practices Influencing the Use of Maternal Health Services in Indonesia

Ni Ketut Aryastami (✉ aryastami@gmail.com)

Indonesian Ministry of Health

Rofingatul Mubasyiroh

National Institute Health Reserach and Development, Indonesian Ministry of Health

Research article

Keywords: traditional practices, maternal health, Indonesia, healthcare utilization

Posted Date: January 13th, 2020

DOI: <https://doi.org/10.21203/rs.2.20650/v1>

License:   This work is licensed under a Creative Commons Attribution 4.0 International License.

[Read Full License](#)

Abstract

Background

Although infrequent, use of traditional birth attendants (TBA) for delivery still exists in Indonesia. The maternal mortality ratio (MMR) at 305 deaths per 100,000 live births in Indonesia is higher than that of the Southeast Asian region (240), and continued use of TBA is suspected to be related to this high MMR. The objective of this analysis is to study the influence of traditional practices, family structure, and TBA density on the use of maternal health services in Indonesia.

Methods

Secondary data analysis involved data from two national surveys— Riset Kesehatan Dasar (Riskesdas) 2010 and the Village Potential Survey 2008. The sample included 14,798 mothers whose last delivery was between January 2005 and August 2010. The independent variables were the use of traditional practices, type of family structure, and density of TBA. The dependent variables were utilization of maternal healthcare, including receiving antenatal care (ANC) and having a facility-based delivery. Multivariate logistic regression was conducted for the analysis by controlling all the covariates.

Results

Disregarding the costs for delivery, traditional practices and high TBA density significantly influenced mother's access to maternal health utilization with a negative direction which is conversely to living in extended family structure. Mothers in villages with a high TBA density had significantly lower odds of receiving complete care and facility-based delivery compared to mothers in villages with low TBA density. Moreover, mothers who lived in an extended family had higher odds of using maternal health services.

Conclusions

Traditional practices significantly influenced the ideal utilization of maternal health care in Indonesia. Higher TBA density in the villages significantly decreased mother's odds of using ANC, skilled birth attendance (SBA), and the complete of maternal health services. Maternal care utilization was positively influenced by living with extended family.

Background

In 2015, the Indonesian maternal mortality ratio (MMR) was 305 per 100,000 live births, according to the Intercensus Population Survey (SUPAS) 2015 (1). Although it has remained high compared to neighboring countries (an average 240) in 2012, the Indonesian MMR dropped from 359 maternal deaths per 100,000 live births (2). The three common delays which adversely affect maternal mortality include: delays in family decision making due to mothers' inability to recognize danger signs in pregnancy; delays in accessing care at a healthcare facility related to geographic barriers and problems with transportation; and delays in receiving care because of the health service quality in healthcare facilities (3). These three

types of delays together caused 85.7 percent of maternal deaths. An analysis in Aceh province, Indonesia found that vaginal bleeding (59.7%), eclampsia (25.5%), and other problems (14.8%) were significant factors in the increased risk of maternal mortality (4).

Traditional beliefs and practices are prevalent in Indonesia similarly to other Asian countries and are known to influence maternal and child health (6, 7). Several studies, especially in Asia and Africa, have used quantitative and qualitative approaches to identify traditional beliefs and practices for pregnancy, which have included special dietary rules, personal hygiene, daily activities/isolation of pregnant women, taboo on informing about pregnancy, and prohibition of sexual intercourse (6,8–10). Traditional childbirth and postpartum practices include the choice of delivery place, fear of exposure to hospital equipment, rituals of cutting the umbilical cord and removing the placenta, breastfeeding and even the tradition of isolating the mother after childbirth and the baby (6,8,10–12).

Previous studies found the key risk factors associated with reduced use of antenatal care (ANC) and facility-based deliveries (FBDs) included low household wealth index, inability to pay for services, low maternal education level, sociocultural factors, low involvement of mothers in the decision-making process, mothers' limited exposure to mass media, far distance to health facilities, and adequate access to and quality healthcare (13–16). Other research examining factors that influence the use of skilled birth attendants (SBAs) for delivery has found that Jaminan Kesehatan Nasional (JKN), Indonesia's national health insurance, has significantly increased the use of SBAs for poor pregnant women. This analysis also found that education and supply-side factors, including the ratio of primary health centers per 1,000 people, significantly influenced SBA use in maternal health care utilization (17).

Indonesia's varied cultures and ethnic group practices underlie health-seeking behavior, particularly for maternal and neonatal health (MNH) services, whether or not these influences are recognized (18). These include the number of TBA in population, the use of traditional practices, and family composition. A study in Uganda found that cultural factors inhibit mothers in using modern ANC. Beliefs and myths often enforce the mothers to give birth at home and implement the practice of traditional umbilical cord cutting (UCC) (19).

Childbirth at home remains prevalent in rural areas in Indonesia. It is related to the presence of and preference for TBAs at the village level. Data from several small qualitative studies in Jakarta, Banten, and West Java found that TBA use was a major sociocultural barrier to MNH utilization (20), and that the traditional beliefs underlying TBA preference were particularly pervasive among low-income families (21). Research also showed that women tended to prefer TBAs because they believed it was easier to interact, have more experiences, are more accessible, and are more likely to encourage natural birth compared to midwives (22). Many types and styles of services performed by TBAs could result in unexpected maternal and newborn complications; such practices include ngolesi (to wet the vagina using coconut oil in the perception to ease the baby's delivery), kodok (the TBA inserting a hand into the uterus to take out mother's placenta), nyanda (having the mother sit in a straight-legged position for hours, with a consequent risk of bleeding and swelling) (23).

Traditional UCC using tools such as bamboo knives—sembilu—or unsterilized razors or scissors, is another traditional practice associated with maternal and newborn complications. It is widely practiced among the Dayak's ethnic group who mostly live in Senggau, West Kalimantan. Improper UCC may cause bleeding in the newborn. Similarly, cutting the placenta with the use of a bamboo knife may cause infection for the mother. Other risk factors associated with traditional UCC is the use of mixed kitchen dust or coffee and the saliva of a betel chewer as an antiseptic, also increase the risk of maternal and newborn complications (24).

Evidence of the influence of family composition on the use of maternal health services is very limited in Indonesia. A small qualitative study in the Klaten district of Central Java found that the social influences of the extended family were associated with increased use of postnatal care (25). Another study that used Indonesian Demographic and Health Survey data found that familial support was associated with a significant increase in the use of ANC services (13).

With regard to family planning methods, problems relating to unmet need are found in many countries. A number of cultural barriers exist, such as religious prohibitions, resistance from men, and misperceptions of the side effects of contraceptives (26–29). This study aims to analyze the evidence of traditional practices that influence the uptake of comprehensive maternal health service use in Indonesia.

Methods

Study design and participants

This study used cross-sectional data from the 2010 Indonesia Basic Health Research Study (Riskesdas 2010) and the 2008 Village Potential Survey (PODES). Although there are two newer Riskesdas datasets for 2013 and 2018, we used the Riskesdas 2010 dataset because it encompassed more variables related to maternal health than the latter. Riskesdas is nationally representative, conducted every five years in all 33 provinces and 441 districts in Indonesia by the National Institute of Health Research and Development (NIHRD), Indonesia Ministry of Health, and focuses on the measurement of health indicators mandated by the Millenium Development Goals or Sustainable Development Goals, such as reducing child mortality and improving maternal health.

The Riskesdas (2010) sampling technique was a two-stage stratified random sampling. The first stage used neighborhood census blocks selected from each district/municipality in proportion to population size. In total, 2,800 census blocks were selected randomly from all possible census blocks. In the second stage, 25 households were randomly selected from each census block, yielding a total of 251,388 individuals from 70,000 households (30). The study sample focuses on mothers who had a live birth in the five years before data collection (January 2005 to August 2010), for a total sample size of 14,798 mothers.

The 2008 PODES was used to generate a variable on TBA density per 1,000 population. PODES 2008 is also nationally representative and conducted every three years by the Central Bureau of Statistics (31).

PODES collected data on the following topics: availability of human resources, natural resources, infrastructure, public facilities, and economic and social facilities at the village level.

Measures

Outcome variables

We examined the factors that influence maternal healthcare use—specifically, four outcome variables describing the maternal health continuum of care:

- 1) ANC use: Defined as use of ANC services ≥ 4 times (ANC ≥ 4)
- 2) SBA use for first contact: Defined as use of a health professional (midwife or doctor, either at home or in a health facility) for the mother's first contact in delivery
- 3) ANC > 4 , SBA use for first and last contact: Defined as the use of ANC ≥ 4 and an SBA for the first and last contact in delivery
- 4) Use of all continuum maternal health services: Defined as use of ANC ≥ 4 , use of an SBA for the mother's first and last contact in delivery, and an FBD

Explanatory variables

This study examines how the use of several traditional practices influences the use of ANC, SBA, and FBD. Three variables were developed to measure cultural constraints that may influence maternal healthcare use: (1) non-medical or traditional practices, (2) family composition, and (3) TBA density. The first variable, "non-medical or traditional practices," refers to traditional beliefs or behaviors practiced by either the mother, her family, or her community. These beliefs and behaviors are proxied with a composite of two traditional practices: (a) use of traditional UCC care and (b) lack of family planning use for traditional reasons (20,25). We use a proximate approach to cultural factors to strengthen our argument regarding the impact of belief and tradition because using only one of these variables may not adequately represent cultural impact for the purposes of our analysis. "Non-medical or traditional practices" was coded as "yes" if the mother used either practice and "no" if the mother did not use either practice. Finally, for the purpose of the analysis we compare women who do not use family planning for traditional reasons to all other women (including women who are using family planning).

The second variable captures the mother's family composition, categorized as either nuclear or extended family (13,25,32). The third variable captures the availability of TBAs at the village level. Evidence shows that the more TBA in the community, the less likely the mother is to use modern MNH-seeking practices (20,21). We measure TBA density as the number of TBA per 1,000 population. TBA density is categorized in five quintiles, from Q1 (low) to Q5 (highest).

Covariates

Our analysis controlled for several demographic, household, and socioeconomic characteristics. Demographic characteristics included the following: mother's age; mother's education; parity; residence type; and region, based on five groups of islands. We also controlled for household socioeconomic status, measured using average expenditure per capita per month, which we divided by five quintiles, from Q1 (poorest) to Q5 (richest), with Q1 representing households spending less than Indonesia Rupiah (IDR) 190,000 per month and Q5 representing households spending more than IDR 1,500,000 per month.

Statistical analysis

Descriptive statistics were used to summarize sample characteristics (Table 1 and Table 2). Categorical variables were summarized using frequencies and their associated percentages.

The Cuzick's test for trend and Z-score were used to examine the outcome proportions for the dependent variables of ANC, SBA, FBD, and all maternal continuum services based on (across ordered groups) the independent variables of cultural barriers and the mother's characteristics (Table 3). Finally, multivariate logistic regression was used to quantify the relationship between potential explanatory variables for maternal health outcomes (Table 4). We analyzed data using STATA version 14.0. We conducted all analyses using the corresponding Riskesdas weights and accounting for the Riskesdas survey design, as published elsewhere (33,34). Plausible covariates for utilization of maternal care were the length of education, age, birth of first child, socioeconomic status, urban-rural location, and region by island group that divided by the big islands.

Results

Sample characteristics

A total of 14,798 mothers were involved in this analysis. Their individual characteristics can be seen at Table 1. The majority of mothers reported the use of non-traditional cultural practices (85.3%) and lived in a nuclear family structure (85.9%). Most mothers were ages 25–34 years at the time of their most recent live birth (53.5%) and had completed only primary school or less (43.1%); a significant proportion came from very poor or poor households (46.2%). The most recent birth was the second birth for most women in the study (33.3%), followed by first birth (28.6%). Approximately half of the women lived in rural areas and half in urban areas; the majority resided in the Java-Bali and Sumatra regions.

Table 1
Sample Characteristics

Variables	N	%
Mother's characteristics		
Mother's age at birth		
15–24 years old	3,962	26.6
25–34 years old	7,914	53.5
35–49 years old	2,922	19.9
Mother's education		
Primary school or less	6,482	43.1
Junior high school	3,267	22.3
Senior high school or more	5,049	34.6
Parity		
1	4,162	28.6
2	4,904	33.3
3	2,892	19.5
4+	2,840	18.7
Household socioeconomic status, by quintile		
Poorest	3,541	23.9
Poor	3,272	22.3
Middle	3,055	20.5
Rich	2,792	18.7
Richest	2,138	14.6
Residence type		
Rural	7,425	48.7
Urban	7,373	51.3
Region		
Java-Bali	7,097	53.0

Variables	N	%
Sumatra	3,724	24.2
Kalimantan	1,202	7.1
Sulawesi	1,352	7.7
Eastern Indonesia	1,423	8.0
Traditional practices measurement		
Non-medical traditional practices		
No	12,521	85.3
Yes	2,277	14.7
TBA density		
Low	3,541	24.2
Few	2,372	17.2
Moderate	2,964	20.2
High	2,968	19.9
Highest	2,953	18.5
Family composition		
Nuclear	12,673	85.9
Extended	2,125	14.1

Proportion of mothers who used maternal health services

The use of maternal health services by mothers is depicted in Table 2. The majority of mothers reported four or more antenatal visits (78.7%), but only 74.2 percent had their first delivery contact with a health professional or SBA. However, the percentage for the last contact for delivery increased to 80.3 percent. Slightly more than half of mothers delivered at a health facility (54.9%).

A total of 63.6 percent of mothers used ANC \geq 4 and SBA for their first and last delivery contact. A smaller proportion of mothers (48%) used the ideal maternal health continuum of services, including four or more ANC visits, use of an SBA for their first and last delivery contact, and use of an FBD.

Table 2
Proportion of mothers who used maternal health services

Mother's use	N	%
Number of ANC visits		
0	1,076	6.6
1–3	2,267	14.6
4+	11,455	78.7
SBA first contact	10,796	74.2
SBA last contact	11,703	80.3
FBD	7,817	54.9
ANC \geq 4 and SBA first and last contact	9,190	63.6
ANC \geq 4, SBA first and last contact, and FBD	6,792	48.0

Our bivariate analysis (Table 3) shows there are difference in the proportion for the dependent variables of ANC, SBA, FBD and all maternal continuum services based on cross ordered groups the dependent variables of cultural barriers and the mother's characteristics. The use of ANC \geq 4, SBAs for first and last contact, and all maternal health continuum services was significantly higher among mothers who did not use non-medical traditional practices. The table also shows the outcome distribution of the continuum of care according to its characteristics. The proxy of traditional practices seems consistent and was lower in all uses of maternal healthcare. The ratio of TBAs was also consistent; the higher the TBA ratio, the lower the proportion of mothers accessing proper ANC. The pattern of the continuum of care goes down for ideal service use; ANC \geq 4; SBA first contact; SBA first and last contact; and use of ANC \geq 4, SBA first and last contact, and FBD. The key outcome of the influence of traditional practices is related to family patterns; mothers who lived in an extended family were more likely to be using maternal healthcare services continuously. The plausible covariates for increasing the use of maternal care were better education (i.e., higher level of mother's education), optimal age (25–34), birth of first child, highest socioeconomic status, urban location, and region (Java-Bali).

Table 3

Traditional practices and continuum of maternal health services utilization

Variables	ANC ≥ 4	SBA first contact	ANC ≥ 4, SBA first and last contact	All maternal continuum services
Cultural barrier measurement				
Non-medical traditional practices	***	***	***	***
No	82.1	79.0	68.1	51.6
Yes	59.0	46.5	37.9	27.3
TBA density				
Low	85.1	88.9	78.6	65.2
Few	89.9	87.6	80.6	72.5
Moderate	82.2	77.6	66.2	48.1
High	76.0	64.4	53.4	34.5
Highest	58.9	49.3	36.5	17.2
Family composition				
Nuclear	78.2	73.8	63.1	47.4
Extended	81.6	76.9	66.6	51.8
Mother's characteristics				
Mother's age at birth		***	***	***
15–24	76.3	69.4	58.7	42.6
25–34	80.9	76.9	67.1	51.2
35–49	75.8	73.3	60.9	46.7
Mother's education		***	***	***
Primary school or less	67.3	57.5	44.9	28.7
Junior high school	81.7	79.0	67.8	49.2
Senior high school or more	90.9	91.9	84.3	71.4

Variables	ANC ≥ 4	SBA first contact	ANC ≥ 4, SBA first and last contact	All maternal continuum services
Parity	***	***	***	***
1	84.0	79.0	70.2	55.2
2	82.7	78.4	69.1	53.1
3	77.1	73.1	62.1	46.4
4+	65.0	60.4	45.6	29.7
Household socioeconomic status	***	***	***	***
Poorest	63.7	57.3	42.8	27.6
Poor	75.9	68.5	56.9	39.4
Middle	81.3	77.9	66.9	49.2
Rich	87.4	84.8	77.0	61.6
Richest	92.6	91.9	86.5	75.8
Residence type	***	***	***	***
Rural	68.5	61.8	48.6	28.2
Urban	88.3	86.0	77.9	66.8
Region	***	***	***	***
Java-Bali	87.1	78.6	72.2	60.9
Sumatera	70.7	79.4	61.1	40
Kalimantan	69.4	67.4	54.1	31.9
Sulawesi	64.2	54.9	40.7	22.7
Eastern Indonesia	68.8	53.9	45.2	25.6
Total	78.7	74.2	63.6	48
Significance (p) at *(< 0.1), **(< 0.05), ***(< 0.01)				

Influence of traditional practices and other factors on maternal health utilization

Table 4 depicts the results of the logistic regression of traditional practices and other factors influencing the continuum of maternal healthcare services utilization. The results indicate that traditional practices

significantly influence maternal healthcare utilization, even when controlling for demographic and socioeconomic characteristics. Mothers who used non-medical traditional practices experienced significantly lower odds of using all services in the maternal health continuum of care compared to women who used modern practices. Specifically, the use of non-medical or traditional practices was associated with 2.1 times lower odds of using ANC ≥ 4 and 3.7 times lower odds of seeking an SBA for first delivery contact ($p < 0.01$). Mothers living in an extended family experienced 1.3 times higher odds of receiving comprehensive maternal care compared to women living in a nuclear family ($p < 0.01$).

Traditional practices more than doubled the odds that a mother would not use maternal health services. As shown in Table 4, the odds ratio of ANC ≥ 4 was 0.5, first contact with SBA (OR = 0.3); ANC ≥ 4 and skilled birth for the first and last contact (OR = 0.4); and finally use of ideal care of ANC ≥ 4 times, SBA first contact, and FBD (OR = 0.5).

Table 4

Multivariate logistic regression of traditional practices and continuum of maternal health services use

Variables	ANC \geq 4		SBA first contact		SBA first and last contact		All maternal continuum services	
	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)
Cultural barrier measurement								
Non-medical traditional practices								
No (ref)	1.00		1.00		1.00		1.00	
Yes	0.47***	(0.41–0.54)	0.27***	(0.24–0.31)	0.38***	(0.33–0.43)	0.5***	(0.43–0.58)
TBA density								
Low (ref)	1.00		1.00		1.00		1.00	
Few	1.04	(0.8–1.3)	0.68**	(0.49–0.92)	0.81*	(0.64–1.02)	0.94	(0.77–1.17)
Moderate	0.85	(0.68–1.04)	0.53***	(0.41–0.68)	0.60***	(0.49–0.73)	0.54***	(0.45–0.65)
High	0.81*	(0.64–1)	0.38***	(0.29–0.48)	0.49***	(0.4–0.59)	0.44***	(0.36–0.54)
Highest	0.55***	(0.44–0.7)	0.26***	(0.2–0.34)	0.35***	(0.28–0.44)	0.30***	(0.24–0.38)
Family composition								
Nuclear (ref)	1.00		1.00		1.00		1.00	
Extended	1.28***	(1.10–1.51)	1.34***	(1.15–1.55)	1.27***	(1.12–1.45)	1.33***	(1.17–1.52)
Mother's characteristics								
Mother's age at birth								

Variables	ANC ≥ 4		SBA first contact		SBA first and last contact		All maternal continuum services	
	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)
15–24 years old (ref)	1.00		1.00		1.00		1.00	
25–34 years old	1.61***	(1.4–1.85)	1.78***	(1.55–2.04)	1.73***	(1.52–1.97)	1.62***	(1.43–1.84)
35–49 years old	1.62***	(1.33–1.98)	2.28***	(1.9–2.77)	1.97***	(1.65–2.35)	2.03***	(1.71–2.4)
Mother's education								
Primary school or less (ref)	1.00		1.00		1.00		1.00	
Junior high school	1.69***	(1.47–1.94)	2.08***	(1.83–2.36)	1.99***	(1.76–2.24)	1.87***	(1.66–2.11)
Senior high school or more	2.61***	(2.26–3.01)	4.06***	(3.45–4.77)	3.35***	(2.95–3.80)	3.23***	(2.86–3.65)
Parity								
1 (ref)	1.00		1.00		1.00		1.00	
2	0.84**	(0.72–0.98)	0.88*	(0.76–1.02)	0.87**	(0.76–0.99)	0.84**	(0.74–0.96)
3	0.64***	(0.54–0.76)	0.65***	(0.54–0.78)	0.66***	(0.56–0.78)	0.67***	(0.57–0.78)
4+	0.49***	(0.4–0.60)	0.48***	(0.39–0.59)	0.46***	(0.38–0.55)	0.44***	(0.36–0.52)
Household socioeconomic status								
Poorest (ref)	1.00		1.00		1.00		1.00	
Poor	1.45***	(1.26–1.66)	1.14**	(0.99–1.32)	1.33***	(1.17–1.51)	1.25***	(1.09–1.42)
Middle	1.68***	(1.44–1.97)	1.47***	(1.26–1.72)	1.64***	(1.43–1.89)	1.50***	(1.30–1.73)
Rich	2.12***	(1.77–2.55)	1.64***	(1.38–1.96)	2.06***	(1.76–2.41)	1.89***	(1.62–2.21)

Variables	ANC ≥ 4		SBA first contact		SBA first and last contact		All maternal continuum services	
	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)
Richest	2.88***	(2.28–3.63)	2.50***	(1.96–3.20)	2.97***	(2.44–3.62)	2.83***	(2.37–3.38)
Residence type								
Rural (ref)	1.00		1.00		1.00		1.00	
Urban	1.40***	(1.20–1.63)	1.51***	(1.28–1.8)	1.43***	(1.24–1.64)	1.85***	(1.62–2.11)
Region								
Java-Bali (ref)	1.00		1.00		1.00		1.00	
Sumatra	0.40***	(0.34–0.47)	1.52***	(1.26–1.84)	0.69***	(0.59–0.80)	0.45***	(0.39–0.52)
Kalimantan	0.42***	(0.34–0.52)	0,94	(0.72–1.21)	0.58***	(0.47–0.70)	0.32***	(0.25–0.41)
Sulawesi	0.42***	(0.33–0.53)	0.57***	(0.45–0.73)	0.39***	(0.32–0.49)	0.27***	(0.22–0.34)
Eastern Indonesia	0.66***	(0.51–0.84)	0.70**	(0.56–0.89)	0.64***	(0.51–0.80)	0.41***	(0.32–0.53)
Significance (p) at *(< 0.1), **(< 0.05), ***(< 0.01)								

Finally, the results show that higher TBA density in the village significantly decreases a mother's odds of using ANC, SBA, and the complete continuum of maternal health services. For example, mothers in villages with the highest TBA-to-population ratios experienced 3.2 times lower odds of receiving the complete maternal health continuum of services compared to mothers residing in villages with the lowest TBA density ratios ($p < 0.01$). It is important to note that the strength, significance, and direction of these relationships hold when analyzing the effects by rural/urban residence. This pattern of association was consistently significant for mothers in Java-Bali islands and was conversely associated with the extended family structure (see Table 1 in the appendix).

Of the demographic and socioeconomic characteristics included in this analysis, the results indicate that mothers' education and socioeconomic status were the two most important predictors of maternal health usage. Mothers who reported finishing high school or more were more likely to use any maternal health services than those who had finished primary school or less. Mothers in the richest socioeconomic status quintile experienced 2.8 times higher odds of using the continuum of maternal health services and 3.0

times higher odds of using ANC ≥ 4 and SBA for first and last delivery contact compared to mothers in the poorest quintile ($p < 0.01$).

Discussion

As expected, the findings of this study confirmed that various factors associated with traditional practices influence use of maternal health services. Mothers who adhered to traditional practices were less likely to use maternal health services, compared to their counterparts who used more modern practices. These results apply to all types of maternal health services and are shown to be a barrier to mothers' use of such services in Indonesia. Research in Uganda and sub-Saharan Africa on the influence of traditional practices such as UCC (specifically using the practice of tying and disposing the placenta as a proxy for cultural barriers) has also found a negative influence on maternal health services use (20).

The use of family planning as part of this study's composite variable has been studied in other countries. From the beginning, the assumption was that the use of contraceptive devices may be influenced by cultural issues and thus could be used as a cultural proxy. Our study's findings are in line with those presented by a study in Mexico where cultural barriers related to family planning were attributable to religious reasons, prohibition by husbands, and fear of side effects. Moreover, this study showed that gender roles and religious objections acted intergenerationally to influence the refusal to use modern methods of contraception. In addition, a low education level resulted in lack of information and misconceptions about the long-term fertility risks due to hormonal exposure from using modern methods (26,28).

The study results also indicate that family structure is an important factor that influences mothers use of ANC ≥ 4 , SBA, and FBD. Extended family structure has a positive influence on the use of MNH services as a whole. These findings are consistent with a study in central Java that found that the extended family is significantly associated with the use of antenatal and postnatal care (13,32). Our study's findings are also consistent with one United States-based study which found no significant influence on MNH utilization for mothers within an extended family comprising other adult members or coparents (35). In addition, a study from Madhya Pradesh, India found that women living in an extended family and who had good family relationships were more likely to receive antenatal services (36); nevertheless, after controlling for sociodemographic characteristics, women living in extended households were less likely to receive either ANC services or an FBD (37). Results from qualitative studies in Egypt, Nepal, and China have also been inconclusive (38–40).

Finally, this study found that the presence of TBAs was also associated with decreased utilization of the full cascade of maternal health services. Mothers who live in an area with a high prevalence of TBAs were less likely to use any maternal health services. In general, mothers may view TBAs as being familiar and of known competence. Indeed, other studies in Indonesia have confirmed the phenomenon of TBAs assisting mothers completely throughout the maternal healthcare continuum, from pregnancy up to delivery and postnatal care hence up to 40 days after birth (41). In some ethnic groups in Indonesia, a

TBA, known as a dukun, is considered to be someone with supernatural power without formal learning, gained through cultural tradition (42). Moreover, mothers who use TBAs receive mantras and herbs believed to make the delivery process more comfortable (22). A study in Bogor district found that using a TBA for delivery was inexpensive and more convenient because TBAs were perceived to be friendlier and have more patience regarding the mother's condition (41). Nevertheless, a study in Cirebon, West Java found, some mothers preferred to delivery with a TBA even though she paid more than SBA (43).

Use of maternal healthcare was also influenced by the mother's age and educational attainment. Study results show that the older and better educated the mother, the greater the odds of using maternal health services. These findings are consistent with those from a study in a Midwestern city in the United States, in which years of education were significantly associated with use of adequate prenatal care (44). Conversely, a study in South Jakarta found that mothers' age, education, occupation, and number of pregnancies had no influence on antenatal care seeking at the appropriate time (45). This contradiction may be due to the different studies' criteria for choosing their subjects and those subjects' socioeconomics background; the first study chose low-income women in a developed country, whereas the latter chose women in a middle-income country with free antenatal services provided by the government. Nevertheless, these free services are not necessarily inexpensive, as geographical access and transportation barriers remain. As a large country with great socioeconomic diversity, the gaps between poor and rich remain very wide, as was found by a study conducted in three districts in West Java (13).

Urban and rural residence and region were two demographic variables signify the difference of maternal health utilization. In Indonesia, economic development has occurred more extensively in the western part of the country, such as in Java-Bali, compared to Nusa Tenggara, Maluku, and Papua in the eastern part. Similarly, the distribution of healthcare facilities is greater in urban areas and the western part of the country. Access to a health facility depends not only on free service provision and distribution of facilities, but also the availability of transportation. Again, a study in West Java showed that distances from health facilities and poor road conditions constrained mothers' access to antenatal care, particularly for those living in the remote areas (13,46).

This study used 2010 Riskesdas data to analyze quantitative evidence on the influence of cultural factors or traditional practices on the utilization of maternal health services in Indonesia. One limitation is that the 2010 Riskesdas is an older dataset. However, it provides the only available data that allow us to analyze the influence of traditional practices at a nationally representative level. As cross-sectional data, this analysis can measure only association, not causation; however, the findings clearly indicate that traditional beliefs and cultural issues are associated with maternal health.

Conclusion

The ideal utilization of maternal care so called continuum maternal health care in Indonesia were significantly influenced by traditional practices after controlling for demographic and socioeconomic

characteristics. Most mothers access incomplete maternal health services from pregnancy to delivery as recommended by the program. Some mothers who have received proper antenatal care preferred to deliver outside of health care facilities or without SBA. We conclude that the traditional practices to the use of maternal health services in Indonesia present a problem that may lead to a high prevalence of maternal mortality. Disregarding costs for delivery, traditional practices and high TBA density significantly influenced mother's access to maternal health utilization with a negative direction conversely to living in extended family structure.

Higher TBA density in the village significantly decreases mother's odds of using ANC, SBA, and the complete continuum of maternal health services. It is important to note that the strength, significance, and direction of these relationships hold when analyzing the effects by rural/urban residence. Mothers' education and socioeconomic status were the two most important predictors of maternal health usage. The pattern of association was consistently significant for mothers in Java-Bali islands and was conversely associated with the extended family structure.

Extended family structures frequently exist in Sulawesi and Eastern Indonesia, and traditional UCC practices occur more often in Eastern Indonesia and Kalimantan. Moreover, Sulawesi and Java-Bali have the highest occurrence of traditional beliefs and practices regarding contraceptive use as a family planning method.

Recommendation

An innovative SBA-TBA partnership could be developed in villages with a high number of TBAs. Such partnerships may provide a "win-win solution." The TBA, in addition to providing some traditional services, may encourage the pregnant women to visit a midwife. The TBA could also report to the SBA so the SBA could follow up the pregnant mothers to have antenatal care and so on. Incentives to foster this prospective solution may need to be considered.

Maternal health is not merely a responsibility of a mother's family, as the community and government also needs to play a role. Due to the decentralization, the involvement of other sectors need to be considered regarding their function. For example, district health offices could help improve the number and quality of health services points; the Ministry of Education could add curricula on reproductive health; and the Ministry of Public Works could ease access of transportation to the health facilities. A comprehensive strategy to increase maternal health services utilization would be the responsibility of the Ministry of Health; such a strategy would include providing qualified health personnel and empowering health providers to implement the standard of basic and comprehensive obstetric neonatal services (PONED/PONEK) at health centers and hospitals.

Finally, future research is needed on the SBA-TBA partnership by taking into account the local tradition in the decentralization era.

Abbreviations

ANC: antenatal care; FBD: facility-based delivery; IDR: Indonesia Rupiah; JKN: *Jaminan Kesehatan Nasional*, or managed care; MMR: Maternal mortality ratio; MNH: maternal neonatal health; NIHRD: National Institute of Health Research and Development; PODES: *Potensi Desa* (Village Potential Survey); SBA: skilled birth attendant; SUPAS: Intercensal Population Survey; TBA: traditional birth attendant; UCC: umbilical cord cutting

Declarations

Acknowledgements

We thank the Ministry of Health, Republic of Indonesia for allowing the use of the Riskesdas dataset. We thank the Health Policy Plus (HP+) project and the U.S Agency for International Development (USAID) for providing technical assistance and funding for publication. Last but not least, many thanks to all of the HP+ team and consultants.

Funding

Support for this work was provided by HP+, a five-year cooperative agreement funded by USAID with Palladium under Agreement No. AID-OAA-A-15-00051. The information provided in this article does not necessarily reflect the views or positions of USAID, the U.S. Government, or Palladium and its partners.

Authors' contributions

NKA and RM contributed equally—NKA for the concept, design of the study and for manuscript writing; RM for running the data analysis. Both authors read and approved the final manuscript.

Ethics approval and consent to participate

Ethical approval for the primary data collection was provided by the Ethic Committee of the NIHRD. Because we conducted a secondary data analysis, the prerequisite of ethics approval is not applicable.

Consent for publication

Not applicable.

Competing interests

The authors declare that they have no competing interests.

References

1. Central Bureau for Statistics. Profil Penduduk Indonesia Hasil SUPAS 2015. Jakarta; 2016.

2. Central Bureau for Statistics. Indonesia Demographic and Health Survey 2012. Jakarta; 2012.
3. Thaddeus S. Too To Walk: Maternal Mortality In Context. *Sm Sci Med Vol.* 1994;38(8):1091–110.
4. Ramli N, Purwita E. Study of maternal mortality risk factor 2016 in Aceh Province midwifery. *Int J Soc Sci Humanit Invent.* 2018;5(06):4776–80.
5. Kotecha P V, Patel S V, Shah S, Katara P, Madan G. Health seeking behavior and utilization of health services by pregnant mothers in Vadodara slums. *h e a l t h l i n e.* 2012;3(1):30–5.
6. Choudhury N, Moran AC, Alam MA, Ahsan KZ, Rashid SF, Streatfield PK. Beliefs and practices during pregnancy and childbirth in urban slums of Dhaka , Bangladesh. *BMC Public Health [Internet].* 2012;12(1):1. Available from: BMC Public Health
7. Withers, Mellissa; Kharazmi, Nina; Lim E. Traditional beliefs and practices in pregnancy, childbirth and postpartum: A review of the evidence from Asian countries. *Midwifery.* 2018;56.
8. Raven JH, Chen Q, Tolhurst RJ, Garner P. Traditional beliefs and practices in the postpartum period in Fujian Province , China : a qualitative study. *BMC Pregnancy Childbirth.* 2007;11:1–11.
9. Finlayson K, Downe S. Why Do Women Not Use Antenatal Services in Low- and Middle-Income Countries? A Meta-Synthesis of Qualitative Studies. 2013;10(1).
10. Akeju DO, Oladapo OT, Vidler M, Akinmade AA, Sawchuck D, Qureshi R, et al. Determinants of health care seeking behaviour during pregnancy in Ogun State , Nigeria. *Reprod Health.* 2016;13(Suppl 1).
11. Nalwadda CK, Waiswa P, Guwatudde D, Kerber K, Peterson S, Kiguli J. 'As soon as the umbilical cord gets off, the child ceases to be called a newborn': sociocultural beliefs and newborn referral in rural Uganda. 2015;1:1–10.
12. Kaphle S, Promotion H, Community D, Hancock H, Psych BA, Associate A, et al. Childbirth traditions and cultural perceptions of safety in Nepal : Critical spaces to ensure the survival of mothers and newborns in remote mountain villages. *Midwifery [Internet].* 2013;29(10):1173–81. Available from: <http://dx.doi.org/10.1016/j.midw.2013.06.002>
13. Titaley CR, Hunter CL, Heywood P, Dibley MJ. Why don ' t some women attend antenatal and postnatal care services ? : a qualitative study of community members ' perspectives in Garut , Sukabumi and Ciamis districts of West Java Province , Indonesia. *BMC Pregnancy Childbirth.* 2010;10(61):1–12.
14. Eryando T. Aksesibilitas Kesehatan Maternal. *MAKARA, Kesehat.* 2007;11(2):76–83.
15. Titaley CR, Dibley MJ, Roberts CL. Factors associated with underutilization of antenatal care services in Indonesia : results of Indonesia Demographic and Health Survey 2002 / 2003 and 2007. *BMC Public Health.* 2010;10(485).
16. Najafizada SAM, Bourgeault IL LR. Social Determinants of Maternal Health in Afghanistan : A Review Social Determinants of Maternal Health in Afghanistan : A Review. *Cent Asian J Glob Heal.* 2017;6(1).
17. Titaley CR, Hunter CL, Dibley MJ, Heywood P. Why do some women still prefer traditional birth attendants and home delivery ? : a qualitative study on delivery care services in West Java Province , Indonesia. *BMC Pregnancy Childbirth.* 2010;10(43):1–14.

18. Teplitskaya L, Ross R, Dutta A. Has Indonesia ' s National Health Insurance Scheme Improved Family Planning Use? 2018;(May 2018).
19. Kasnodihardjo. Praktek Budaya Perawatan Kehamilan Di Desa Gadingsari Yogyakarta. *J Kesehat Reproduksi*. 2013;3(3):113–23.
20. Wilunda C, Quaglio G, Putoto G, Lochoro P, Oglio GD, Manenti F, et al. A qualitative study on barriers to utilisation of institutional delivery services in Moroto and Napak districts , Uganda : implications for programming. *BMC Pregnancy Childbirth*. 2014;14(259):1–12.
21. Brooks MI, Thabrany H, Fox MP, Wirtz VJ, Feeley FG, Sabin LL. Health facility and skilled birth deliveries among poor women with Jamkesmas health insurance in Indonesia : a mixed- methods study. *BMC Health Serv Res*. 2017;17(105):1–12.
22. Agus Y, Horiuchi S. Factors influencing the use of antenatal care in rural West Sumatra , Indonesia. *BMC Pregnancy Childbirth*. 2012;12(9):1–8.
23. Agus Y, Horiuchi S, Porter SE. Rural Indonesia women ' s traditional beliefs about antenatal care. *BMC Res Notes*. 2012;5(1):1.
24. Iskandar MB. *Mengungkap Misteri Kematian Ibu di Jawa Barat*. Depok; 1996.
25. Suprabowo E. *Praktik Budaya dalam Kehamilan , Persalinan dan Nifas pada Suku Dayak Sanggau , Tahun 2006*. *J Kesehat Masy Nas*. 2006;1(3):112–21.
26. Jackson A. *Socio-cultural barriers to family planning access*. 2013.
27. Stephenson R, Hennink M. *Barriers to Family Planning Service Use among the Urban Poor in Pakistan*. 2004. p. 1–34.
28. Dansereau E, Schaefer A, Hernández B, Nelson J, Palmisano E, Ríos-zertuche D, et al. Perceptions of and barriers to family planning services in the poorest regions of Chiapas , Mexico : a qualitative study of men , women , and adolescents. *Reprod Health*. 2017;14(129):1–10.
29. Mustafa G, Azmat SK, Hameed W, Ali S, Ishaque M, Hussain W, et al. Family Planning Knowledge , Attitudes , and Practices among Married Men and Women in Rural Areas of Pakistan : Findings from a Qualitative Need Assessment Study. *Int J Reprod Med*. 2015;
30. NIHRD IM. *Riset Kesehatan Dasar 2010*. 2010.
31. Statistics CB of. *Village Potential Statistics of Indonesia*. Jakarta; 2008.
32. Probandari A, Arcita A, Kothijah K, Pamungkasari EP. Barriers to utilization of postnatal care at village level in Klaten district , central Java Province , Indonesia. *BMC Health Serv Res*. 2017;17(541):1–9.
33. Mihardja L, Siswoyo H, Ghani L, Soegondo S. Prevalence and Determinants of Diabetes Mellitus and Impaired Glucose Tolerance in Indonesia (A Part of Basic Health Research / Riskesdas). *Acta Med Indones-Indones J Intern Med*. 2009;41(4):169–74.
34. Afifah T. *Perkawinan Dini dan Dampak Status Gizi pada Anak*. *Gizi Indones*. 2011;34(2):109–19.
35. Gonzalez M, Jones D, Parent J. *Coparenting Experiences in African American Families : An Examination of Single Mothers and their Nonmarital Coparents*. *Fam Process*. 2014;53(1):33–54.

36. Allendorf K. The Quality of Family Relationships and Maternal Health Care Use in India. *Stud Fam Plann.* 2010;41(4):263–76.
37. Saikia N, Singh A. Does Type Of Household Affect Maternal Health? Evidence From India. *J.biosocSci.* 2017;41:329–53.
38. Zhang L, Xue C, Wang Y, Zhang L, Liang Y. Family characteristics and the use of maternal health services: a population - based survey in Eastern China. *Asia Pac Fam Med.* 2016;15(5):1–8.
39. Ayumi O. Family Support For Women ' S Health-Seeking Behavior: A Qualitative Study In Rural Southern Egypt (Upper Egypt). *Nagoya J Med Sci.* 2014;17–25.
40. Morrison J, Thapa R, Basnet M, Budhathoki B, Tumbahangphe K, Manandhar D, et al. Exploring the first delay: a qualitative study of home deliveries in Makwanpur district Nepal. *BMC Pregnancy Childbirth.* 2014;14(1):1–7.
41. Khasanah N. Dampak persepsi budaya. *MUWÂZÂH.* 2011;3(2):487–92.
42. Suparlan. *The Javanese dukun.* Jakarta: Peka Publication; 1991.
43. Anggorodi R. Dukun Bayi Dalam Persalinan Oleh Masyarakat Indonesia. *MAKARA, Kesehat.* 2009;13(1):9–14.
44. Schaffer MA, Lia-hoagberg B. and Health Behaviors of Low-Income Women. *JOGNN.* 1997;26(4):433–40.
45. Aryastami NK, Shankar A, Kusumawardani N, Besral B, Jahari AB. Low birth weight was the most dominant predictor associated with stunting among children aged 12 – 23 months in Indonesia. *BMC Nutr.* 2017;3(16):1–6.
46. Gamelia E, Sistiarani C, Masfiah S, Kesehatan J, Fakultas M, Universitas IK, et al. Determinant of mother ' s prenatal care behaviour. *J Kesehat Masy Nas.* 2013;8(3):109–14.