

*Article*

**Antenatal care practice and pregnancy outcome at Kudat area, Sabah, Northern Borneo**

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**Abstract:** Women have been fulfilling their reproductive responsibility of propagating human race, many have died and many more faced death in the process of delivering babies, but this can be prevented by taking appropriated antenatal care, clean and safe delivery and essential obstetric care. Antenatal care is the first phase to be encountered once a woman has conceived. The objective of the study was to assess the antenatal (AN) care practice and pregnancy outcome of ever-married women aged 18 to 49 years old having at least one pregnancy experience, residing in kampongs of Kudat area, Sabah, East Malaysia, Northern Borneo from December 2015 to October 2016. Cross-sectional analytical study, non-probability convenient sampling method was used and 300 eligible participants were interviewed face to face by trained interviewer using pretested questionnaire. 99.3% of all the women received AN care, and 97% of the women received AN care practice (AN visit of 4 times and above). Mean AN visit was 9 times. The study revealed that overall knowledge amongst the women with good knowledge was 47.2% and low knowledge was 52.8%. Additionally, there was significant association between education and knowledge, income and knowledge, AN care practices and knowledge. But there was no significant association between AN practice and complication. Despite these results, outcomes were good and all complications were properly and successfully addressed. This may reflect the effectiveness of current national maternal health programs.

**Keywords:** knowledge; antenatal care; AN care practice

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**1. Introduction**

Women have been fulfilling their reproductive responsibility of propagating human race, many have died and many more faced death in the process of delivering babies, but this can be prevented by taking appropriated antenatal care, clean and safe delivery and essential obstetric care. Antenatal care is the first phase to be encountered once a woman has conceived.

As recommended by WHO, regular antenatal (AN) care is essential during pregnancy. It suggested that a pregnant women should get at least minimum 4 antenatal visits. At each visit, regular blood pressure examination should be done and observation of any swelling of feet and face is also essential. She should have two tetanus toxoid injections at one month interval and be supplied with daily folic and iron tablets. During pregnancy period, she should consume a variety of food more often (WHO, 1999).

According to Maternal Mortality Review in Malaysia 2012, Maternal Mortality Ratio is 28/100,000 live birth in 2010 and Antenatal Coverage (ANC) for the year 2010 is also 98% of pregnant women. Utilization of antenatal care services was six visits in 1980 and it was increased up to 12visits in 2010 (Yadav, 2012). According to the Perinatal Care Manual edited by the Ministry of Health Malaysia, primigravida women are advised to go for a

total of ten visits during their pregnancy and for multigravida women, the total recommended antenatal visit is eight sessions (MOH Malaysia, 2013).

Proper antenatal care would promote reproductive health; prevent unforeseen complication, resulting in reduced maternal and foetal mortality. Hence it is the high time to assess on ante-natal care related knowledge, ante-natal practice and outcome of pregnancy among ever married women in Kudat, Sabah. It was expected that this study would provide some evidence on current maternal and child system has been moving on well track for MGD goal 5.

## 2. Materials and Methods

The objective of the study was to assess the antenatal (AN) care practice and pregnancy outcome of ever-married women aged 18 to 49 years old having at least one pregnancy experience, residing in kampongs of Kudat area, Sabah, East Malaysia, Northern Borneo. A community based cross-sectional analytical study was conducted in kampongs of Sikuati, Matunggong and Kudat, Sabah, East Malaysia from December 2015 to October 2016. Sample size was calculated using WHO sample size determination method and getting the sample size of 300 at 5% level of significance and margin of error at 6%. Non-probability convenient sampling method was used and 300 eligible participants were interviewed through face to face by trained interviewers using a semi-structured questionnaire and their knowledge of AN care, their AN care practices, outcomes and complications of their pregnancies were recorded. The questionnaire was developed in English and then translated into Bahasa Melayu with backward and forward translation. Pre-test was conducted in kampong Korina and modifications were made before data collection. Ethical approval was obtained from University Malaysia Sabah with the number of JKEtika 3/15(10). Consent was taken from the participants and confidentiality of the data was assured. Data entry, data cleaning and analysis were conducted by using SPSS version 22 software. Chi-square testing and appropriate statistical tests were used. Inclusion criteria were ever married women aged 18 to 49 years having at least one pregnancy experienced within five years and gave consent to participate in the study. Exclusion criteria was all ever married women who had no pregnancy experience within 5 years, who were unwilling to participate in this study and all women who were having their first pregnancy.

## 3. Results

### 3.1. Socio-demographic characteristics of study population

A total of 300 eligible women participated in this study. Nearly half (47%) was between 25 and 34 years old. Mean age was 33.8 years with a SD of 7.4 years and the range was 19-49 years. Almost all of the women (95%) were married. Rungus made up the majority of study population (54%), followed by Ubian (24%) and others (22%).

Regarding occupation, majority was being housewives (83%), some was government employee (3%) and doing odd job (7%). Regarding occupation of husbands, they were farmers (28%), government employees including retirees (10%), and unemployed (19%). Type of families was mostly nuclear (72%).

Household income per month was ranged from RM 50 to 5500, with earning RM2000 and above (8%), and income below RM540 (38%). Mean income was RM 898.25. Majority of respondents attended lower secondary (36%) and upper secondary (23%) respectively while 11% of them were non formal education.

### 3.2. Knowledge on ante-natal care

Nearly all of the respondents could correctly state the definition and duration of pregnancy. Ninety five percent knew the timing for first AN visit. WHO recommended minimum ante-natal care should be 4 visits and frequency of AN visits were correctly responded in this study by at least 4 times (46%), and four and more than 4 times (40%).

Main source of ante-natal information was from health personnel (54%). Places of AN care were responded at hospitals (77%) and health centers (85%). Only 66% knew that ATT must be received twice while 8% knew the correct time for resting hours during day time. Seventy one percent of respondents knew the correct duration of exclusive breast feeding for 6 months. Most of the respondents knew correct frequency of AN visits for first trimester (93%), second trimester (99%), and 36 weeks onwards (99%). About 54% of mother knew the correct birth spacing interval. In this study, mothers were aware that high risks of pregnancy as diabetes mellitus (78%) and high blood pressure (92%) respectively. Respondents could answer correctly for warning signs in pregnancy were vaginal bleeding (97%), fits (97%), loss of consciousness (75%), headache and blurred vision (76%) and delivery attendants should be doctors (84%) and other health personnel (81%) for safe delivery. All respondents knew that AN care was important for pregnancy. Majority of respondents knew that AN care was needed for

ensuring mother and baby in the healthy state. Some responded that it was needed for safe delivery and avoiding complications.

### 3.3. Level of knowledge on ante-care of respondents

There were 15 questions testing on knowledge regarding AN care. Each correct answer earned one mark and incorrect answer earned none. For multiple answers, each correctly answer earned one mark. The range of knowledge score was between 12 and 23. Mean and median were being 18 with 2.62 as standard deviation. The knowledge scores were divided into two categories by using the median knowledge score (as the cutoff point) and found good knowledge category (47%) and poor knowledge category (53%) (Table 1).

### 3.4. Ante-natal practice of study population

Nearly all of the respondents received ante-natal care (99%). They were encouraged to get ante-natal care by health care providers (39%). They were taken ante-natal care from nurses (89%), doctors (9%) and by themselves (only two respondents). Ante-natal care was received at a health clinic (54%) and at clinic desa (38%). AN care was started to be taken at one month (11%), at two months (36%), at three months (40%) and late AN care (13%). Regarding frequency of ante-natal care, nearly 2% were taken less than 4 times and the rest (98%) were taken 4 AN visits and more. Mean ante-natal visits was 9 times. More than 80% of respondents received all types of AN care services.

### 3.5. Outcomes of pregnancies of studied respondents

Mode of delivery were by normal spontaneous vaginal delivery (91%), LSCS (8%) and instrumental delivery (1%). Birth attendants were by doctors (36%) and other health personnel (64%). All delivery was institutionalized at hospitals (97%) and health clinics (3%). About 92% of them had no maternal and infant complication. One baby was died in neonatal period.

### 3.6. Association between knowledge score and education

It was found that as education level increased, knowledge score also increased. There was statistical significant association between education level and knowledge score on AN care ( $p=.023$ ) (Figure 1).

### 3.7. Association between income and knowledge score of respondents

A significant association between income and knowledge ( $p=0.006$ ) was found. As income increased, good knowledge score also increased (Table 2).

### 3.8. Association between education and income of respondents

A significant association between education and income ( $p=0.000$ ) (Table 3).

### 3.9. Association between AN care knowledge and AN care practice

AN care knowledge was found to be significantly associated with AN care practice. As number of AN visit increased, good knowledge score also increased ( $p=0.005$ ) (Table 4).

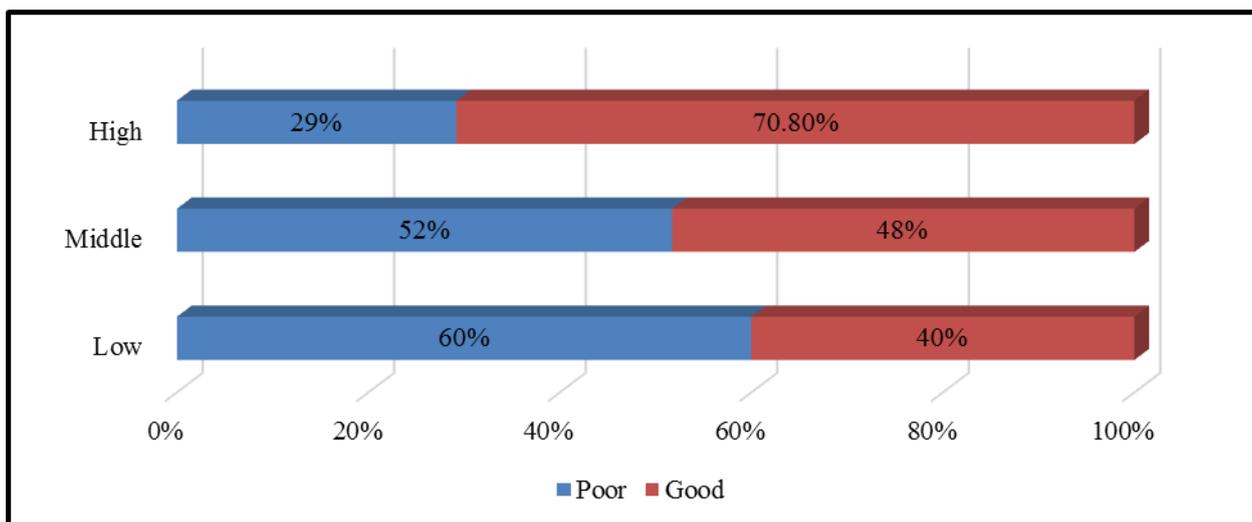
### 3.10. Association between AN care practice and complication after delivery

There was no significant association between AN practice and complication after delivery. But as the number of AN visit increased in frequency there were also decrease in number of complication after delivery (Table 5).

**Table 1. Level of knowledge on ante-natal care by respondents.**

Knowledge score	Frequency	%
Poor( $\leq 18$ )	158	52.67
Good ( $>18$ )	142	47.3
Total	300	100

Range=12 to 23; Mean = 18.04; SD = 2.62; Median=18



$\chi^2 = 7.539$ ; P value = 0.023

Figure 1. Association between education and knowledge on ante-natal care.

Table 2. Association between income and knowledge on ante-natal care.

Income group	Total knowledge score		Total
	Poor	Good	
Extremely poor	75(65.2%)	40(34.8%)	115(100%)
Poor	43(46.7%)	50(53.3%)	93(100%)
Moderate	31(43.6%)	36(53.7%)	67(100%)
High	9(36%)	16(64%)	25(100%)
Total	158(52.8)	142(47.2%)	300(100%)

$\chi^2 = 12.45$ ; P = 0.006

Table 3. Association between education and income of respondents.

Education	Income				Total
	Extremely poor RM <540	Poor RM541-959	Moderate RM 960-1999	High RM 2000 and above	
Low	64 (64%)	27 (27%)	7 (7%)	2 (2%)	100(100%)
Middle	45 (25%)	61 (35%)	53 (30%)	17 (10%)	176 (100%)
High	6 (25%)	5 (21%)	7 (29%)	6 (25%)	24 (100%)
Total	115 (39%)	93 (31%)	67 (22%)	25 (8%)	300 (100%)

$\chi^2 = 56.841$ , P value = 0.000

Table 4. Association between antenatal care knowledge and AN care practice.

AN practice	Total Knowledge Score		Total
	Poor(= $\leq$ 18)	Good(>18)	
1 to 3 visits	4(80.0%)	1(20.0%)	5(100%)
4 to 9 visits	96(60.4%)	63(39.6%)	159(100%)
10 to 20 visit	57(42.5%)	77(57.5%)	134(100%)
Total	157(52.7%)	141(47.3%)	298(100%)

$\chi^2 = 10.806$ ; P value = 0.005

**Table 5. Association between ante-natal care practice and complications after delivery.**

AN practice	Complication after delivery		Total
	Yes	No	
1 to 3 visits	0 (0.00%)	5 (100%)	5 (100%)
4 to 9 visits	14 (8.8%)	145 (91.2%)	159 (100%)
10 to 20 visits	9 (6.7%)	125 (93.3%)	134 (100%)
Total	23 (7.7 %)	275 (92.3%)	298 (100)

$\chi^2 = 0.871$ ; P value = 0.647

#### 4. Discussion

##### 4.1. Knowledge on ante-natal care

Lothian (2009) recommended about every pregnant woman needs to know the most important way to ensure a healthy and safe birth by choosing an appropriate provider and safe place of birth. In this study, places of ante-natal care were responded at hospitals (77%) and health centers (85%), and all respondents knew that hospitals were safe places for delivery.

WHO (2006) recommended that pregnant women should go for their first ANC visit as early as possible in pregnancy preferably in the first trimester. In this study, only 39% of respondents knew about visiting as early as possible and 56% of them knew correctly about first ANC visit within first trimester.

UNICEF, UNFPA and WHO recommended that a minimum of four antenatal care visits should be taken during pregnancy (UNICEF, 2015). In this study, respondents knew correctly as at least 4 times (46%), 4 to 6 times (13%) and more than 4 times (40%). This study finding on correct frequency of ante-natal visits needed to know was only 1% which was much lower than that of (Rosliza and Muhamad, 2011) in which 25% did not know correctly. This study was comparable with (Halle, 2015) conducted at Cameroon, where pregnant women's knowledge about the timing, goals of ANC visits, and the number of antenatal visits were key parameters for knowledge on ante-natal care.

Ghanaian mothers on knowledge of birth spacing revealed that a greater proportion of women (98%) had heard about birth spacing, however only a few (10%) had in depth knowledge (Christina, 2014).

In this study, only 54% of respondents knew correctly the birth spacing interval. So health education during post-natal care should be highlighted for birth spacing interval.

In this study, mothers were aware that high risks of pregnancy as diabetes mellitus (78%) and high blood pressure (92%) respectively. Rosliza and Muhamad (2011) revealed only about half of these women were aware of the complications of diabetes and high blood pressure. In this study, respondents could answer correctly for warning signs in pregnancy were vaginal bleeding (97%), fits (97%), loss of consciousness (75%), headache and blurred vision (76%). Shirin (2011) stated that pregnant women's knowledge of the danger signs was poor, as only 42% knew about swelling of the feet, 36% were aware of fits, 26% knew about severe headaches and 25% knew about unusual bleeding. Matyukira (2014) stated that women had good knowledge about vaginal bleeding as a danger sign during pregnancy (93%), and pregnancy risks as diabetes and high blood pressure (82%). Results of Rosliza and Muhamad (2011) also indicated that it was not easy for women to identify the complications which may arise with such conditions during pregnancy.

In this study, delivery attendants should be doctors (84%) and other health personnel (81%) for safe delivery. All respondents knew that AN care was important for pregnancy. Majority of respondents knew that AN care was needed for ensuring mother and baby in the healthy state. Some responded that it was needed for safe delivery and avoiding complications. In the South-West zone of Nigeria study stated that 94% of the respondents agreed that the goal of focused antenatal was to prepare the pregnant mothers for delivery and possible complications (Amosu *et al.*, 2011).

Considerably less women knew that anti-tetanus toxoid (ATT) must be received twice (66%). It could reveal the gap for the importance of second dose of Tetanus Toxoid vaccination during pregnancy although all knew that vitamin supplements and nutritious foods were essential.

Good knowledge score on AN care 47% found in this study was comparable with that of 44% found out in Rosliza and Muhamad (2011) study but could be lower than that stated by Ojong *et al.* (2015) study at Nigeria having nearly 80% and by Matyukira (2014) study revealed 68%. It could reflect the need of health education program to be reviewed on imparting the components and benefits of AN care.

#### 4.2. Practice on ante-natal care

In this study, nearly 87% of respondents started to take ante-natal care within first three months which was much higher than that of 43% revealed by Matyukira (2014) study.

WHO (2015) stated that only 64% of pregnant women received the recommended minimum of four antenatal care visits or more globally suggesting that large expansions in antenatal care coverage are still needed. This study finding on ante-natal care at least 4 times was 98% could be regarded as quite satisfactory and even much higher than global indicator of women receiving ante-natal care at least once 83% for the period 2007-2014.

In this study, more than 92% of respondents received all ante-natal care related service during pregnancy. Only 81% of them answered for blood glucose testing and 86% stated that they had done ultrasound examination. It might be due to recall bias or not knowing the types of blood test examined.

#### 4.3. Knowledge on ante-natal care and socio-economic conditions

In this study, higher education level was statistically significant association with higher knowledge score on AN care. According to Zhao *et al.* (2009) education is the most powerful influence on the knowledge score of maternal health. One anecdotal evidence from China study revealed that women who had education of junior high school or higher had a better knowledge level than those who were less educated. Onasoga *et al.* (2012) stated that an educated woman was more aware of health problems, availability of health services and utilization of this information more effectively than someone who was not educated. In this study, higher income was also related with higher knowledge score which was consistent with findings of the study done in Bangladesh (Kabir and Khan, 2013). Higher income was also associated with higher education which in turn related with higher knowledge score.

#### 4.4. Ante-natal care practice and associated factors

In this study, there was significant association between ante-natal care visit and ante-natal care knowledge ( $p=0.005$ ). It could not be differentiated that higher ante-natal care knowledge promoted ante-natal care practice or the repeated knowledge had gained through multiple ante-natal visits. But YeY *et al.* (2010) studied in Lao PDR confirmed that level of education and ante-natal knowledge were most important predictors of ante-natal utilization, women who were highly knowledgeable were 6.5 times (95% CI: 2.4to17.6) more likely to do so than those who were deficient in knowledge.

#### 4.5. Outcome of pregnancy

There was no significant association between frequency of antenatal visits and complication after delivery. This might be due to all mothers were delivered by skilled birth attendants at hospital or clinic facilities. The direct relationship between antenatal care visits and pregnancy outcomes could not be elucidated.

### 5. Conclusions

Access to ante-natal care practice could be regarded as highly satisfactory but thorough knowledge about the importance of ante-natal care should be strengthened. Lower education and poor people could be assumed as vulnerable and marginalized group as ante-natal care knowledge was related with education and income, and ante-natal visit at least four times was also related with ante-natal care knowledge. The pregnancy outcomes and complications were favorable with all the deliveries were institutionalized and attended by skilled health personnel. It could be assumed that current maternal and child health system had been moving on well track in the pursuit of MGD goal 5.

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#### Conflict of interest

None to declare.

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