ORIGINAL ARTICLE

ANTENATAL CARE (ANC) SERVICES UTILIZATION IN MATERNAL AND CHILD HEALTH (MCH) CLINICS OF KINABATANGAN (RURAL) AND SANDAKAN (URBAN) OF SABAH, MALAYSIA

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ABSTRACT

This paper investigates the antenatal care (ANC) services utilization in currently pregnant women during their visits to maternal and child health (MCH) clinics of rural (Kinabatangan) and urban (Sandakan), Sabah. A community clinic based, cross-sectional descriptive study was performed. In total, 800 currently pregnant women attending two MCH clinics, from April to September 2012, were participated using tested set questionnaires. Descriptive analysis was used for background characteristics and chi-square analysis was applied to identify the rural-urban differences among the variables.In both study areas, previous births delivered by skilled birth personnel were same. In pregnant women from rural, less income, more grand-multiparity, earlier antenatal care booking, more frequent post-natal care, more use of contraception compared to those in urban. In comparison, urban pregnant women had more anti-tetanus toxoid injection in their previous pregnancies, past history of antenatal care for at least four times, increase in household members. As this study found the differences in ANC services utilization at Rural and Urban, further study is needed to explore concrete reasons for above findings. By delivering services according to the needs of all clients, irrespective of their place of residence, it will improve ANC services utilization in both areas of Sabah and hence will improve more on existing health status of the Nation.

Keywords: Antenatal Care Services Utilization in MCH, Pregnant women, Rural, Urban, Sabah

INTRODUCTION

Appropriate antenatal (AN) care is one of the pillars of safe motherhood initiative. The aim of this is to assist pregnant women to remain healthy, to find and correct adverse conditions when present and thus aid the health of the unborn[1]. Antenatal care should also provide guidance to the woman and her partner or family by helping them in their transition to parenthood [2]. According to World Health Organization (WHO), all pregnant women are recommended to get their first antenatal checkup in first trimester to identify and manage any medical complications by screening of risk factors which may affect the progress and outcome of their pregnancy[3].

Moreover, the United Nation's Sustainable Development Goal No 3; Good Health and Well-being and No 5; Gender Equality highlight on the maternal health by providing good health and well-being of women, as well as ensuring universal access to sexual and reproductive health and reproductive rights for women, gender equality and reduced inequalities among regions and areas[4].

Maternal motivation is the antecedent to access the AN care and hence utilization is the consequence of motivation and access. Millennium Development Goals 5 (MDGs 5) was to achieve universal access to reproductive health by 2015. An analysis of World Health Statistics 2013 indicates there was a presence of health inequities in antenatal care coverage between urban and rural areas[5].

The Ministry of Health (MOH) Malaysia takes attention on AN care visit for pregnant women in order to improve health and well-being of mother and child. Malaysia's MOH recommends ten ANC visits for normal uncomplicated primigravida and seven visits for normal uncomplicated multigravida based on a 40-week pregnancy. Additionally, two routine visits to a medical doctor are included for each uncomplicated pregnancy attending ANC at the public sector health clinics[6].

As a consequence, Malaysia had made a significant progress towards achieving Millennium Development Goal (MDG) target 5A; reducing

Maternal Mortality Ratio (MMR) by 75% in 2015 compared to 1990. In Malaysia, MMR was 23.2 /100,000 live births in 2012 and had a prolonged plateau in the decline of MMR, despite 98.7% of childbirths were attended by skilled health personnel, 99.0% percent of deliveries were in health facilities and 97.3% of pregnant women had antenatal care coverage (at least one visit) [7].

Malaysia has an excellent infrastructural layout for Maternal and Child Health Services delivery in the community through a network of primary health centers such as rural clinic, mobile clinic, flying doctor service, health clinic, community clinic, maternal and child health clinic, district hospital, state medical college hospital, other clinics and hospitals in the public and private sectors. According to 2014 statistics, Malaysia has a population of 30.09 million and 25.3% live in rural areas[8]. In order to serve this population, the country is divided into 13 States which include Sabah and Sarawak and 3 federal territories. Sabah is subdivided into 15 districts which include our study areas of Kinabatangan and Sandakan. The Second Malaysia National Health Morbidity Survey (MNHMSII) showed that 88.5% of the population lives within 5 km of the health facilities, but in Sabah, only 67% of the rural population lived within 5 km to the nearest facility[7,8]. On the other hand, MMR in Malaysia was stagnated at 23.2 per 100,000 live births since 2013 after declining from 44 per 100,000 live births in 1990. At the current pace of decline, Malaysia did not meet the target of 11 deaths per 100,000 live births set in the MDG framework. Malaysia's ability to reduce MMR (41% from 1990 to 2007) was comparable to 30 -50 % of MMR declination in Egypt, Honduras, Sri Lanka and Mongolia. Therefore, it is highlighted that further attention to the under-served groups and rural areas are required for further reduction of MMR[5].

Moreover, Malaysian government recognized the maldistribution of health care personnel continues to pose problems in rural areas of Sabah and Sarawak[7,8]. Based on the reviewed literatures, there is no comparative study to investigate the differences of antenatal care services utilization between rural and urban areas in Malaysia. Hence, the objective of this research was to assess the ANC services utilization in MCH clinics of Kinabatangan (rural) and Sandakan (urban) in Sabah, thereby providing the information of rural and urban differences in antenatal care services utilization in Malaysia. This study also described the socio-demographic characteristics of women attending the antenatal clinics of MCH services in selected area of rural and urban of Sabah.

MATERIAL AND METHODS

This is a community clinic based, cross-sectional, descriptive study. Two clinics, one from urban area of Sabah (Sandakan) and one from rural area of Sabah (Kinabatangan) were selected by non-probability sampling (convenient sampling) method. All pregnant women attending antenatal care at these two MCH clinics of Kinabatangan and Sandakan during the study period were asked for informed consent to participate in this study. Post-natal women were excluded from the study. In total, eight hundred currently pregnant women; four hundred and one from urban, Sandakan and three hundred and ninety nine from rural, Kinabatangan, were consented and included in the study. After obtaining this, they were recruited to answer the tested set questionnaire which was questioned and filled by trained staffs of respective clinics supervised by researchers. The study period was 6 months from April 2012 till September 2012.

Frequency distribution for descriptive analysis and chi-square analysis was done using SPSS version 21. This study was conducted after the research proposal was approved by Rural Medicine Research Unit of Faculty of Medicine and Health Sciences, University Malaysia Sabah. Ethical approval to conduct the study was obtained from Medical research and ethics committee of Office of the Deputy Director General of Health, research and technical support, Ministry of Health, Malaysia on 12th March 2012. NMRR -11-316 -8764.

RESULTS

The descriptive findings in Table 1 showed there were Sabah Ethnics, Indonesians, Philippines, Malays and others were living in Sandakan and Kinabatangan. The majority of participants in both clinics were the same in 20-34 years age group, which was followed by 35-44 years and 15-19 years. More educated women with Pre University and University level were found in Sandakan; while more under graduated women were found in Kinabatangan. The majority of participants in both areas were married (96.3 % Vs 98.2%) followed by single mother (2.2 % Vs 0.8%) in rural and urban area respectively. Most of the participants in both clinics came from the larger family size, 5 to 9 (46.9% in Sandakan compared to 36.1% in Kinabatangan), followed by small family size of less than or equal 4. However, big family size of more than or equal 10 was still present in both areas; 14.2% Vs 8.5% in Sandakan and Kinabatangan respectively.

Table 1. Descriptive demographic characteristics in Sandakan and Kinabatangan

Variables	Sandakan (urban) (Frequency %)		Kinabatangan(rural) (Frequency %)		pvalue
Race (N= 800)					
▪ Malay	19	(4.7)	9	(2.3)	p = 0.146
▪ Sabah Ethnics (Bajau , Kadazandusun, Murut, Rungus,Sungai,Tidung)	202	(50.3)	195	(48.9)	
▪ Indonesians	68	(17.0)	153	(38.3)	
▪ Philippines	82	(20.4)	17	(4.3)	
▪ Others (Brunei, Iban, Kedayan, Melanau, Sarawak, Sino)	19	(4.7)	24	(6.0)	
▪ Chinese	9	(2.2)	1	(0.3)	
▪ Indians	1	(0.2)	0	(0)	
▪ Not Available	2	(0.2)	0	(0)	
Total	401	(100.0)	399	(100.0)	
Age (N= 800)					
▪ <15	2	(0.5)	2	(0.5)	p = 0.480
▪ 15 – 19	30	(7.5)	42	(10.5)	
▪ 20 – 34	294	(73.3)	296	(74.2)	
▪ 35 – 44	69	(17.2)	52	(13.0)	
▪ >= 45	2	(0.5)	2	(0.5)	
▪ Not Available	4	(1.0)	5	(1.3)	
Total	401	(100.0)	399	(100.0)	
Education Level (N= 800)					
▪ Illiterate	43	(10.7)	38	(9.5)	p = 0.164
▪ Primary	142	(35.5)	150	(37.6)	
▪ Secondary	159	(39.7)	176	(44.1)	
▪ Pre University	5	(1.2)	4	(1.0)	
▪ College/University	32	(7.9)	24	(6.0)	
▪ Others	19	(4.7)	7	(1.8)	
▪ Not Available	1	(0.3)	0	(0.0)	
Total	401	(100.0)	399	(100.0)	
Marital Status (N= 800)					
▪ Married	386	(96.3)	392	(98.2)	p = 0.233
▪ Single	9	(2.2)	3	(0.8)	
▪ Divorce	2	(0.5)	0	(0.0)	
▪ Separated	2	(0.5)	3	(0.8)	
▪ Others	2	(0.5)	1	(0.2)	
Total	401	(100.0)	399	(100.0)	
Household members (N= 800)					
▪ <=4	120	(29.9)	166	(41.6)	p = 0.000
▪ 5- 9	188	(46.9)	144	(36.1)	
▪ >=10	57	(14.2)	34	(8.5)	
▪ Not Available	36	(8.9)	55	(13.8)	
Total	401	(100)	399	(100)	
Income in RM (N= 800)					
▪ <500	86	(21.4)	135	(33.8)	p = 0.003
▪ 500 to 2499	280	(70.0)	234	(58.6)	
▪ 2500 to 4499	23	(5.7)	23	(5.8)	
▪ >= 4500	4	(0.9)	2	(0.5)	
▪ Not Available	8	(2.0)	5	(1.3)	
Total	401	(100)	399	(100)	

Most of the currently pregnant women in Sandakan and Kinabatangan had an income of RM 500.00 to RM 2,499.00 (70.0% Vs 58.6%). In Kinabatangan, there were more pregnant women who had less than RM 500.00 per month compared to Sandakan; 33.8% Vs 21.4%.

Table 2a. Obstetric history of currently pregnant women in Sandakan and Kinabatangan

Variables	Sandakan(urban) (Frequency %)	Kinabatangan(rural) (Frequency %)	Chi square test (p value)
Pregnant women with number of pregnancies (Gravida)(N= 800)			
▪ 1 - 4	331 (82.5)	324 (81.2)	p = 0.286
▪ >= 5 - 9	60 (15.0)	70 (17.5)	
▪ >= 10	10 (2.5)	5 (1.3)	
Total	401 (100.0)	399 (100.0)	
Pregnant women with number of previous miscarriages (N= 561)			
▪ 0	221 (80.9)	220 (76.4)	
▪ 1	45 (16.5)	50 (17.4)	p = 0.154
▪ 2	7 (2.6)	13 (4.5)	
▪ 3	0 (0.0)	3 (1.0)	
▪ 4	0 (0.0)	2 (0.7)	
Total	273 (100.0)	288 (100.0)	
Pregnant women with number of previous still births (N= 561)			
▪ 0	259 (94.9)	271 (94.1)	
▪ 1	14 (5.1)	13 (4.6)	p = 0.271
▪ 2	0 (0.0)	3 (1.0)	
▪ 3	0 (0.0)	1 (0.3)	
Total	273 (100.0)	288 (100.0)	
Causes of still births (N=31)			
▪ Accident	3 (1.4)	0 (0.0)	
▪ Asphyxiated	1 (7.2)	1 (5.9)	p = 0.127
▪ Others	10 (91.4)	16 (94.1)	
Total	14 (100.0)	17 (100.0)	
Number of pregnant women with previous history of Under one year deaths (N= 561)			
▪ 0	262 (96.0)	277 (96.2)	
▪ 1	9 (3.3)	10 (3.5)	p = 0.818
▪ 2	2 (0.7)	1 (0.3)	
Total	273 (100.0)	288 (100.0)	
Causes of Under one year deaths (N=22)			
▪ Preterm birth	1 (9.1)	1 (9.1)	
▪ Severe infection	2 (18.2)	2 (18.2)	p = 0.663
▪ Birth asphyxia	2 (18.2)	2 (18.2)	
▪ Congenital anomalies	2 (18.2)	0 (0.0)	
▪ Others	4 (36.3)	6 (54.5)	
Total	11 (100.0)	11 (100.0)	
Number of pregnant women with previous history of Under 5 mortality (N= 561)			
▪ 0	272 (99.6)	284 (98.6)	p = 0.088
▪ 1	0 (0.0)	4 (1.4)	
▪ 2	1 (0.4)	0 (0.0)	
Total	273 (100.0)	288 (100.0)	
Causes of Under 5 mortality (N=5)			
▪ Acute respiratory tract infection	0 (0.0)	2 (50.0)	p = 0.361
▪ Others	1 (100.0)	2 (50.0)	
Total	1 (100.0)	4 (100.0)	

Table 2b. Obstetric history of currently pregnant women in Sandakan and Kinabatangan (cont)

Variables	Sandakan(urban) (Frequency %)		Kinabatangan(rural) (Frequency %)		Chi square test (*p* value)
Number of previous deliveries in multipara(Parity) (N= 561)					
▪ 0	14	(5.1)	31	(10.8)	*P* = 0.02
▪ 1-4	223	(81.7)	210	(72.9)	
▪ >=5-9	32	(11.7)	45	(15.6)	
▪ >=10	4	(1.5)	2	(0.7)	
Total	273	(100.0)	288	(100.0)	

Table 2 shows the obstetric history of pregnant women in both clinics. There was a significant association between the history of previous deliveries and the location. The urban pregnant women had delivered 1-4 babies; 81.7% Vs 72.9% and rural population had more grand multipara (>=5 deliveries); 15.6% Vs 11.7% (*p*< 0.02)

Table 3. Antenatal care services utilization status of currently pregnant women in Sandakan and Kinabatangan

Variables	Sandakan(urban) (Frequency %)		Kinabatangan(rural) (Frequency %)		Chi square test (*p* value)
Timing of antenatal care booking in gestational age(weeks) (N= 800)					
▪ Not Available	0	(0.0)	9	(2.3)	*P* = 0.001
▪ 1-12	129	(32.1)	221	(55.4)	
▪ 13-28	234	(58.4)	153	(38.3)	
▪ >28	38	(9.5)	16	(4.0)	
Total	401	(100.0)	399	(100.0)	

According to Table 3, there was a significant association between locations and ANC services utilization status: 'Timing of antenatal care booking in gestational age' in weeks, pregnant women in Kinabatangan booked earlier in first trimester compared to Sandakan (55.4% Vs 32.1%).

Table 4 showed that there were differences in utilization in antenatal and post-natal care services in Sandakan and Kinabatangan. In Sandakan urban study area, more pregnant women had past history of having antenatal care for 4 times (87.5%Vs 79.2%). More pregnant women attended urban Sandakan MCH took anti-tetanus toxoid in previous pregnancies (92.3% Vs 85.8%).More currently pregnant women attending rural Kinabatangan clinics had post-natal care at 6 weeks after their previous delivery (84.1% Vs 80.9%) and took contraception after deliveries (68 % Vs 57.5%).
While enquired about reasons not delivered by skilled birth personnel in previous pregnancies, pregnant women attending rural Kinabatangan clinics experienced transportation difficulties(23.4% Vs 13.7%), difficult access to health services(11.8% Vs 7.8%) while women in urban Sandakan clinics experienced financial difficulties (29.5% Vs 5.9%) and unexpected delivery (5.9% Vs 3.9%).

There were significant associations between locations and accessibility to health services; 'Time taken from home to clinic (minutes)', 'Types of transport from home to clinic' and 'Living condition' was shown in Table 5. The difference was 70% of women in Sandakan needed less than 30 minutes to reach clinic, while 53 % of women from Kinabatangan took less than 30 minutes. It seems that the transportation difficulties are major challenges for pregnant women in Kinabatangan area.

Table 4. Antenatal care and post-natal care services utilization status of previous pregnancies of currently pregnant women in Sandakan and Kinabatangan

Variables	Sandakan (urban) (Frequency %)	Kinabatangan (rural) (Frequency %)	Chi square test (*p* value)
Past history of having ANC at least 4 times in previous pregnancies (N= 561)			
▪ Yes	239 (87.5)	228 (79.2)	*P* = 0.001
▪ No	34 (12.5)	46 (15.9)	
▪ Not Available	0 (0.0)	14 (4.9)	
Reasons given why not having ANC at least 4 times in previous pregnancies (N= 65)			
▪ Financial problem	5 (14.7)	1 (2.2)	*P* = 0.000
▪ No time for AN Care	26 (76.5)	16 (34.8)	
▪ Not Available	3 (8.8)	29 (63.0)	
Previous births delivered by skilled birth personnel in multiparous pregnant women (N= 561)			
▪ Yes	221 (80.9)	233 (80.9)	*P* = 0.424
▪ No	51 (18.7)	51 (17.7)	
▪ Not Available	1 (0.4)	4 (1.4)	
Reason for not delivered by skilled birth personnel in previous pregnancies (N= 102)			
▪ Unexpected delivery	3 (5.9)	2 (3.9)	*P* = 0.002
▪ Transportation difficulties	7 (13.7)	12 (23.4)	
▪ No knowledge	1 (2.0)	1 (2.0)	
▪ Others	17 (33.3)	10 (19.6)	
▪ Difficult Accessibility to health clinic	4 (7.8)	6 (11.8)	
▪ No ANC	2 (3.9)	1 (2.0)	
▪ Financial problem	15 (29.5)	3 (5.9)	
▪ Not Available	2 (3.9)	16 (31.4)	
Previous postnatal care at 6 weeks after delivery (N= 561)			
▪ Yes	221 (80.9)	242 (84.1)	*P* = 0.010
▪ No	51 (18.7)	37 (12.8)	
▪ Not Available	1 (0.4)	9 (3.1)	
Reasons for not having Postnatal Care at 6 weeks (N= 85)			
▪ Transport problem	5 (9.8)	5 (13.5)	*P* = 0.001
▪ Financial problem	10 (19.6)	3 (8.2)	
▪ Others	30 (58.8)	11 (29.7)	
▪ Not Available	6 (11.8)	18 (48.6)	
Anti-Tetanus Toxoid (ATT) in previous pregnancies (N= 561)			
▪ Yes	252 (92.3)	247 (85.8)	*P* = 0.02
▪ No	19 (7.0)	31 (10.7)	
▪ Not Available	2 (0.7)	10 (3.5)	
History of taking contraception after previous pregnancies (N= 561)			
▪ Yes	157 (57.5)	196 (68.0)	*P* = 0.003
▪ No	115 (42.1)	86 (29.9)	
▪ Not Available	1 (0.4)	6 (2.1)	
Reason for not taking contraception after previous pregnancies (N= 201)			
▪ Wish to get pregnant	36 (31.3)	18 (20.9)	*P* = 0.000
▪ Husband doesn't allow	14 (12.2)	4 (4.7)	
▪ Natural method	29 (25.2)	19 (22.1)	
▪ Afraid of side effects	8 (6.9)	2 (2.3)	
▪ Others	24 (20.9)	12 (14.0)	
▪ Not Available	4 (3.5)	31 (36.0)	

DISCUSSION

Sandakan, urban study area is located in the North East coast of Sabah. Our urban study area, primary care clinic of Sandakan, covered a population of 110,748 in 2011[9].

Kinabatangan, rural study area is also located in the North East coast of Sabah with 7,549 km square making it the largest district in Sabah. The total population of Kinabatangan is 156,296 in 2011(10). The population in both study areas consist of various tribes of Sabah ethnics namely Sungai, Dusun, Bajau, Idahan, Murut, Mysticism and other bumiputera.

Regarding socio demographic factors, this study analyzed user related items namely age, ethnicity, household members, education, income, marital status and number of pregnancies and deliveries.

The 15-19 year age group of currently pregnant women in rural Kinabatangan and urban Sandakan was of 10.5% and 7.5%but young adolescent pregnancy was same in both study areas of 0.5% each. Adolescent birth rate (births per 1,000 women aged 15-19 years) in Malaysia was 14 in 2012and on average, adolescent mothers delivered close to 17,000 live births a year in the period of 2000-2012 according to Millennium Development Goals Report of Malaysia in 2015[11].

In the findings, majority were Sabah ethnics of 48.9 % and 50.3% in rural Kinabatangan and urban Sandakan and the rest were Malays (2.3 % Vs 4.7%), Indonesians (38.3% Vs 17%), Philippines (4.3%Vs 20.4%), others (6.0% Vs 4.7%) includes Brunei, Iban, Kedayan, Melanau, Sarawak and Sino. Chinese and Indians contribute small percentage (0.3%Vs 2.2% and 0% Vs 0.2%) in both rural and urban areas.

Regarding household members, it was found that more small household members (41.6%) in rural compared to urban (29.9%) with the reason that household members from rural mobilized to urban for job opportunity.

In Malaysia, the literacy rate among adults aged more than or equal to 15 years was 93.1% in 2010 (7) which was in accord with our findings of 90.5% and 89.3% were literates in Kinabatangan and Sandakan.

In 2014, Gross national income per capita was (ppp int. $) of Malaysia was 37,486. Our findings showed majority had an income of less than RM 2, 500.00 per month (92.4% in Kinabatangan Vs 91.4% in Sandakan). More people from rural had income of less than RM 500.00 per month compared to urban people (33.8% Vs 21.4%).

Table 5. Accessibility to health clinics in Sandakan and Kinabatangan

Variables	Sandakan (urban) (Frequency %)	Kinabatangan (rural) (Frequency %)	Chi square test (p value)
Time taken from home to clinic (minutes) (N= 800)			
▪ < 30	282 (70.3)	211 (52.9)	*P*= 0.000
▪ 30-60	104 (25.9)	131 (32.8)	
▪ >60	8 (2.1)	55 (13.8)	
▪ Not Available	7 (1.7)	2 (0.5)	
Different types of transport from home to clinic (N= 800)			
▪ Boat	16 (4.0)	22 (5.5)	*P*= 0.000
▪ Own Car	143 (35.7)	213 (53.4)	
▪ Motorbike	4 (1.0)	36 (9.0)	
▪ Walking	25 (6.2)	48 (12.0)	
▪ Public Transport	204 (50.9)	66 (16.6)	
▪ Others	5 (1.2)	14 (3.5)	
▪ Not Available	4 (1.0)	0 (0.0)	
Living condition (N= 800)			
▪ Village	284 (70.8)	206 (51.6)	*P*= 0.000
▪ Palm oil estate	22 (5.5)	178 (44.6)	
▪ Island	7 (1.7)	0 (0.0)	
▪ Lodging camp	0 (0.0)	11 (2.8)	
▪ Others	83 (20.7)	4 (1.0)	
▪ Not Available	5 (1.3)	0 (0.0)	

Majority in the study population were married women (98.2% in Kinabatangan Vs 96.3 % in Sandakan) and the rest were single parents, divorced and separated. Most of the respondents

from rural and urban were multi-parity (parity 1-4) with 81.2% Vs 82.5% , however grand multipara and great grand-multipara were less than 20% in both study areas (18.8% in Kinabatangan Vs 17.5 % in Sandakan).

In WHO health statistics of 2013, Malaysia health inequities statistics were not available yet (5). The neighboring country, Indonesia showed that their under 5 mortality had rural - urban difference of 60 % Vs 38%. In this study, there was no significant difference between Kinabatangan and Sandakan regarding under 5 mortality (1.4% Vs 0.4 %). When the causes of under 5 mortality were analyzed; 2 died of acute respiratory tract infection and 2 died of other causes in Kinabatangan. Regarding under 1 mortality, it was same in rural and urban (3.8% Vs 4.0%). The causes were congenital anomalies, prematurity, birth asphyxia and infections. The first two were major causes for under 1 mortality in Malaysia[7].

When the timing of antenatal care booking was reviewed, there was a significant difference between Kinabatangan and Sandakan; more pregnant women from rural had early antenatal care booking (55.4% in Kinabatangan Vs 32.1% in Sandakan). This finding was also found in Jamaica where urban female were significantly less likely to attend the antenatal care during first trimester with the reason that it was associated with increased household expenditure [12].

The Millennium development goals (MDG) 5 A stated that AN care should be received at least 4 times in every pregnancy[13]. In this study, both areas have achieved this as 79.2% of the study population in Kinabatangan and 87.5% in Sandakan have had at least antenatal care 4 times in their previous pregnancies. In our study, the reasons of not having antenatal care for at least 4 times in their previous pregnancies were financial constraints (14.7% Vs 2.2%) and not having time to attend antenatal clinic (76.5% Vs 34.8%)in urban and rural areas respectively. In 2013, Antenatal care coverage (at least one visit) was 98.0% in Millennium Development Goals Report of Malaysia in 2015. Regarding health inequities, the antenatal care coverage for rural and urban Malaysia was not available in WHO 2013 health statistics, but in Indonesia, this was 75% for the rural and 90% for urban[5].

In Malaysia, 98.7% of births were attended by skilled health personnel in 2012but in both study areas, skilled birth attendants delivery rate was of 80.9% which was the same in rural and urban and was left behind the national figure[7]. The reasons for not delivered by skilled health personnel in study areas were transportation difficulties in nearly one quarter in Kinabatangan (23.4% in rural Vs 13.7% in urban) and difficult

accessibility to health clinic (11.8% in Kinabatangan Vs 7.8% in Sandakan). The financial problem accounted for 30% of the study population in urban Sandakan and 6% in rural Kinabatangan. In 2013 WHO health statistics, Indonesia showed that rural- urban difference of delivery by skilled health personnel was 63 % Vs 88% (5) which was not similar to our study where rural and urban had the same delivery rate by skilled birth personnel (80.9% in each area) .

Currently pregnant women who had previous postnatal care at 6 weeks were 80.9% Vs 84.1% in urban and rural areas. In WHO country cooperative strategy (CCS) of Malaysia, 90% had postnatal care at 2 days after delivery (5). When our study looked for reasons of not having postnatal care at 6 weeks after delivery, both study areas revealed financial problem was more in Sandakan (19.6% Vs 8.2%) and transport problem was more in Kinabatangan(13.5% Vs 9.8%).

In Malaysia, it was evident that the national coverage against neonatal tetanus was 90% in 2013 WHO health statistics. In present study, history of having ATT in previous pregnancies was of 86% and 92% in rural Kinabatangan and urban Sandakan.

In this study, urban dwellers were less contraceptive users (57.5 % Vs 68.0%) than rural dwellers. The contraceptive prevalence rate with modern methods was 54.0% in Millennium Development Goals Report of Malaysia in 2015 as per data for 2014 which was the preliminary result of the 5th Malaysian Population and Family Survey. In Indonesia, the contraceptive prevalence rate with modern methods were same for the rural and urban (58% vs. 57%) which was different from our study[5]. When the reasons for not having contraception was reviewed, it was revealed that most of them wish to get pregnant after preceding delivery (31.3% Vs 20.9%), prefer to use natural methods (25.2%Vs 22.1%), husband did not allowed them to use it (12.2%Vs 4.7%) and some were afraid of contraceptives' side effects (6.9% Vs 2.3%) in urban and rural areas respectively. The MDG of Malaysia, 2010 also showed that higher proportion of urban women (42.1%) had an unmet need compared to rural women (30 % per cent)[13].

When supply related items of Antenatal care services utilization were analysed in terms of distance to nearest health clinic, in this study, nearly half (47.1%) of the pregnant women from rural area took more than 30 minutes to get access

to the nearest health clinics. This was in accord with the Ministry of Health, Malaysia profile showed that 33 % of the rural people in Sabah were living more than 5 kilometres away from the nearest health clinic[7,8].

Regarding transportation system, half of the study population in the rural areas used their own cars (53.4% Vs 35.7%) followed by public transport (16.6% Vs 50.9%), by walking (12% Vs 6.2%), by boat (5.5% Vs 4%) compared to urban areas. Nearly half of the rural population in this study (44.6%) lived in palm oil estate. It was found that one fifth of the study population (20.7%) in Sandakan did not have proper living conditions. The reason was they were immigrants from Philippines and Indonesians.

Strength and Limitation
The strength of the study was two co-researchers supervised the whole data collection process for each study area. They counter-checked the entire questionnaires which were asked by their staffs before sending to two research assistants for data entry.

There were limitations in this study that some important information was related with women's self-reported history of previous pregnancies and deliveries which could lead to recall bias. It also leads to non-available information of some variables in both study areas and more on rural.

CONCLUSION

In this study, the rural-urban difference was found not only in antenatal care but also postnatal and contraception services utilization. The rural area (Kinabatangan) has advantageous in services utilizations than urban area (Sandakan) in spite of the previous births delivered by skilled birth personnel were same during study period. The most challenging problem for accessibility in rural area was transportation barrier, while financial problem is major concern for urban area. In Kinabatangan, rural area, more pregnant women have early booking in first trimester, more post-natal care at 6 weeks after previous delivery, more used contraception after previous pregnancies. In Sandakan, urban area, more people had their anti-tetanus toxoid injection in previous pregnancies, past history of having antenatal care for at least 4 times and increase in household members compared to those residing at Kinabatangan, rural area. From these findings of our study, it is concluded that future research is needed to explore concrete reasons of significant findings for the differences of antenatal, postnatal care services and contraceptives utilization between rural and urban areas of Malaysia.

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