PUBLIC HEALTH RESEARCH

Late Antenatal Booking and its Predictors in Lundu District of Sarawak, Malaysia

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ABSTRACT

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Introduction Antenatal care is widely acknowledged as an effective tool to prevent adverse outcomes in pregnant women and their children. In Malaysia, early entry to antenatal care refers to a first visit within the 12th week of gestation. Delayed access to antenatal care has not been extensively studied in Malaysia, whereas several studies have reported a high prevalence of late antenatal booking in developing countries. The objective of this study was to determine the factors and barriers associated with late antenatal booking and the level of knowledge about the timing of antenatal booking among women of childbearing age in the Lundu District of Sarawak.

Methods This was a cross-sectional study among 284 pregnant women in all five Maternal and Child Health (MCH) Clinics of Lundu.

Results The prevalence of late antenatal booking in Lundu was 28.2%. Unmarried women were more likely to book their pregnancy late compared to married women. The prevalence of late antenatal booking was also higher among unemployed women than those who were employed. Respondents without their own income also tended to book their pregnancy later than those who had their own income. Significantly, a high percentage of late antenatal booking was also reported among those who never utilize any contraceptive method, did not plan their pregnancy, those without a history of past medical illness or complications in a previous pregnancy and among those who have a problem with their marriage certificate. Those who booked their pregnancy beyond the 12th week of gestation were also reported to have a lower level of knowledge about the need for an antenatal booking, as compared to those who started their antenatal care early.

Conclusions Unplanned pregnancy, marriage certificate issues, an absence of past medical illness and past obstetric complications were significant predictors of late antenatal booking. Correct and appropriate information relating to antenatal care should be delivered to the public. Health education and advocacy are vital to promote the importance of early antenatal booking to achieve the goal of safe motherhood.

Keywords Antenatal care - Late antenatal booking - Predictors - Lundu district.

INTRODUCTION

Antenatal care (ANC) is widely acknowledged as an effective tool to prevent adverse outcomes in pregnant women and their children. ANC services include: information, education, screening for abnormalities and complications, ongoing assessment and care, and preparation for delivery and motherhood. Therefore, ANC is an effective means of detecting and treating ailments, providing time for intervention, promoting health and facilitating informed choice.[1] Fundamentally, antenatal visits allow medical personnel to screen pregnant women for health and socioeconomic conditions. Interventions are performed for any condition which is likely to increase the possibility of specific adverse pregnancy outcomes. Having a new life developing inside the womb is a journey full of emotion, challenges and at the same time wonderful for every woman. ANC provides pregnant women with guidance and all the basic knowledge necessary to plan and prepare for a safe birth.

Internationally, the current consensus states that pregnancy must be booked as early as the first trimester of pregnancy.[2] Early booking enables the mother to obtain correct dating of the pregnancy, which is important for monitoring the growth of the fetus. In addition, women who have early antenatal care benefit from early blood tests which can detect any abnormal blood counts, and immunity screening for different infections. Early diagnosis improves health outcomes by providing care at the earliest stage. Unlike most areas of public health, maternity care is a complex process that involves a wide range of preventive, curative, and emergency services as well as various levels of care. From 2006-2013, antenatal care coverage in Malaysia (at least 1 visit) was 97%. In the same period, 99% of births were attended by skilled health personnel.[3] Clearly, we can see the association between antenatal visits and safe delivery.

In Malaysia, antenatal care policy follows the latest guidelines. Its main priority is to promote safe pregnancy. The guidelines recommend that the first antenatal visit should be made prior to the 12th week of gestation.[4] Despite WHO endorsement and Malaysia's ANC policy, studies in several parts of Peninsular Malaysia show that late booking of pregnancy remains a problem for the Ministry of Health. Studies conducted in an Orang Asli (Indigenous peoples) community in the district of Jempol, Negeri Sembilan in 2011 indicated that only 48.1% of women made their antenatal booking in the first trimester. A high proportion of those with early bookings were young mothers aged less than 30.[5] This figure is lower than that in the studies done in 1998 to assess nutritional status among Orang Asli women in the Kuantan District of Pahang, in which 63.6% of respondents had their first antenatal checkup during the first trimester.[6] No similar study has ever been carried out in Sarawak. Therefore, this research was aimed at identifying the prevalence of late antenatal booking and the factors associated with it among pregnant women in the Lundu District of Sarawak. At the same time, knowledge about antenatal booking was also assessed among these women.

METHODOLOGY

Study setting, design and participants

Lundu district is located at the Northwest of Kuching Division of Sarawak, Malaysia, and borders with Indonesian Province of West Kalimantan. It has surface area of 1,962.2 km^2 (757.6 sq. mi) with a total population of approximately 35000 (2016). Under the Lundu District Health Office's jurisdiction, there are five Maternal and Child Health Clinics (MCH) providing antenatal care services to the people of Lundu. The community of Lundu is diverse in ethnicities which include Malay, Bidayuh, Iban, Chinese and Melanau. This allows us to recruit participants from several types of communities and multi ethnic groups. This was a health facility based cross sectional study involving antenatal mothers attended Maternal and Child Health Care (MCH) Clinics. It involved all the 5 MCH Clinics in Lundu namely, MCH Lundu, MCH Sematan, MCH Biawak, MCH Sampadi and MCH Stoh.

Sample size, sampling and data collection

The required sample size was 206 based on the 16% prevalence of late antenatal booking from a pilot study that was conducted earlier in Bau district of Sarawak. Attrition rate of 20% was being added and hence total participants needed for this study was 248. Systematic random sampling method was applied in which every odd number of antenatal mothers attending Maternal and Child Health Clinic (MCH) from January 2016 to June 2016 were approached for this study. It was being done during the antenatal clinic days. MCH Lundu and Sematan is situated in the semi-urban part of Lundu, while the rest are located at the rural side. All the MCHs were included in this study for result and outcome to be representative of the whole Lundu District. Consented respondents were briefed on this study and self-administered questionnaire were given. In addition, participant's antenatal and medical record were reviewed to identify the exact antenatal booking timing for every respondent.

Data collection instrument

A set of questionnaires was constructed based on available literatures that consists of 5 constructs:

a) Socio demographic and economy status.
b) Current obstetric status.
c) Past Medical illness and obstetric history.

d) Other factors causing late antenatal booking.

- In this construct, the respondents were asked on barrier towards antenatal booking. It consists of 4 questions and for every question, they were requested to identify the magnitude of the barrier (Not a barrier to me, somewhat of a barrier, medium barrier to me or extreme barrier to me). For every level of barrier, points were given accordingly (table 2) Reliability test, the Cronbach's alpha value was 0.764.

e) Knowledge on late antenatal booking.

- This construct consists of 10 questions to assess the knowledge of respondents on antenatal booking. For every question, the respondents were required to select one correct answer out of 3 options (True, False or Don't Know). Reliability analysis, the Cronbach's alpha value was 0.794.

Data analysis

The collected data were coded and analysed using Statistical Package for Social Science (SPSS) version 22. All the data were being thoroughly checked and cleaned prior to analysis. First, data were analysed descriptively to determine the frequency, percentage, mean, median and standard deviation. For categorical data, Chi square test were used to assess the relationship between the independent variables and timing of antenatal booking. Independent *t* test was used if the independent variable was numerical. Subsequently, multivariate logistic regression was used to find the multivariate association between socio demographic characteristics, current obstetric status, past obstetrics and medical history and other potential barriers of late antenatal booking. Prior to multivariate analysis, univariate analysis was performed and all the independent variables with *p value* of less than 0.2 were selected to be analysed in multivariate analysis. In the meantime, multicollinearity, assumptions, outliers and interactions were checked. From the outcome in the multivariate logistic regression, odd ratio of more than one indicates an increased odd associated with late antenatal booking. At the same time, odds ratio of less than one indicates opposite result. In this test also, *p value* of less than 0.05 is considered statistically significant.

Ethical consideration

Approval to conduct this research was obtained from Medical Research Ethics Committee (MREC) of Universiti Malaysia Sarawak (UNIMAS). Subsequently, approval from Medical Research Ethics Committee of Ministry of Health Malaysia was granted. Permission to collect data from health care facilities was obtained from Divisional Health Office of Kuching. Participation in this research was voluntary.

RESULT

Socio demographic characteristics of respondents

A total of 284 respondents from 5 Maternal and Child Health Clinics in Lundu District took part in this study. All our respondents were pregnant mothers, aged between 16 to 44 years old with the age interval of 28 years. The mean age of respondents was 27.5 (6.0) years. More than half of the respondents (57.4%) was from the age group of 20 to 29 years old. Majority of the respondents were married (92.6%) and Malaysians (96.1%). About half of them were from the ethnic group of Bidayuh (45.4%) and Christians (51.5%). Most of them had obtained secondary education (81.3%), were unemployed, including housewives and students (15.8 %); and without own income (69.7%). Meanwhile, 93.7% of the respondents were non-dependant on public transportation and about a third of them (33.8%) lived less than 5 km away from the nearest Maternal and Child Health Clinic (MCH) and 11.3% lived within 15-20 km from the nearest MCH. From the univariate analysis, late booking was significantly associated with several demographic factors (Table 1), obstetric and medical history of the respondents (Table 2).

Obstetric status, history and past medical history of respondents

More than half (51.1%) of the respondents had history of using contraception prior to the current pregnancy. More than half (58.8%) of the respondents had planned for their current pregnancy. Meanwhile, 50.4% of the respondents reported to have symptoms of hyperemesis gravidarum during the early pregnancy. Majority of the respondents (72.9%) were not in their first pregnancy i.e. multigravida. The remaining 27.1% were primigravida mothers. Only a total of 19.4% of the pregnant women had past medical illness like asthma, hypertension, diabetes mellitus, hyperthyroidism and others. A total of 62.3% of the respondents had history of uncomplicated spontaneous vaginal delivery (SVD) in their previous pregnancy. Those without history of delivery made up of 26.1% followed by complicated delivery which accounted for 11.6%. The complicated delivery included those who had history of caesarean section, assisted delivery and birth before arrival. During their previous pregnancy, half of the respondents (51.4%) had no obstetric complication and 22.9% had obstetric complication such as premature delivery, miscarriages, postpartum hemorrhage, mal-presentation, fetal distress, neonatal death and twin delivery.

Table 1 Socio demographic characteristics of respondents

Characteristics	n=284	Timing of antenatal booking		*p-value*
		Late booking (%)	Early booking (%)	
Age (years)				[2]0.320
<20	25	9 (36.0)	16 (64.0)	
20-29	163	50 (30.7)	113 (69.3)	
30-39	86	18 (20.9)	68 (79.1)	
>40	10	3 (30.0)	7 (70.0)	
Mean (SD)		26.5 (6.36)	27.9 (5.87)	[1]0.385
Marital status				[2]0.009
Married	263	68 (25.9)	195 (74.1)	
Not married	21	12 (57.9)	9 (42.1)	
Nationality				0.624
Malaysian		77(28.2)	196(71.8)	
Non-Malaysian		3(27.3)	8(72.7)	
Ethnicity				[2]0.066
Malay	97	23 (23.7)	74 (76.3)	
Bidayuh	129	45 (34.9)	84 (65.1)	
Others	58	12 (20.7)	46 (79.3)	
Religion				[2]0.476
Muslim	115	28 (24.3)	87 (75.7)	
Christian	145	44 (30.3)	101 (69.7)	
Others	24	8 (33.3)	16 (66.7)	
Education status				[2]0.117
Primary and below	32	11 (34.4)	21 (65.6)	
Secondary education	231	67 (29.0)	164 (71.0)	
Tertiary education	21	2 (9.5)	19 (90.5)	
Occupation				[2]0.048
Employed	86	18 (20.9)	68 (79.1)	
Unemployed	198	62 (31.3)	136 (68.7)	
Has own income?				[2]0.048
Yes	86	18 (20.9)	68 (79.1)	
No	198	62 (31.3)	136 (68.7)	
Dependent on public transportation?				[2]0.604
Yes	266	75 (28.2)	191 (71.8)	
No	18	5 (27.8)	13 (72.2)	
Distance of house				[2]0.615
< 5km	116	23 (24.0)	73 (76.0)	
5-10km	76	26 (34.2)	50 (65.8)	
10-15km	45	14 (31.1)	31 (68.9)	
15-20km	32	8 (25.0)	24 (75.0)	
> 20km	35	9 (25.7)	26 (74.3)	

P<0.05, [2]p-value from chi square, [1]p-value from independent t-test

Table 2 Obstetric and medical history of respondents

Characteristics	n=284	Timing of antenatal booking		*p-value*
		Late booking (%)	Early booking (%)	
Usage of family planning prior to this pregnancy				0.021
Yes	139	31 (22.3)	108 (77.7)	
No	145	49 (33.8)	96 (66.2)	
Current pregnancy being planned?				< 0.001
Yes	167	32 (19.2)	135 (80.8)	
No	117	48 (41.0)	69 (59.0)	

History of morning sickness?				0.418
Yes	143	39 (27.3)	104 (72.7)	
No	141	41 (29.1)	100 (70.9)	
Number of pregnancy				0.130
Primigravida	77	26 (33.8)	51 (66.2)	
Multigravida	207	54 (26.1)	153 (73.9)	
Past medical illness?				0.020
Yes	55	9 (16.4)	46 (83.6)	
No	229	71 (31.0)	158 (69.0)	
Smoking history				0.633
Yes	7	2 (28.6)	5 (71.4)	
No	277	78 (28.2)	199 (71.8)	
History of operation on reproductive system				0.451
Yes	12	4 (33.3)	8 (66.7)	
No	272	76 (27.9)	196 (72.1)	
History of blood transfusion				0.541
Yes	6	2 (33.3)	4 (66.7)	
No	278	78 (28.1)	200 (71.9)	
Previous delivery				0.442
Uncomplicated SVD	177	47 (26.6)	130 (73.4)	
Complicated delivery	57	8 (24.2)	49 (75.8)	
No history of delivery	50	25 (33.8)	25 (66.2)	
Previous pregnancy with complication				0.006
Yes	65	10 (15.4)	55 (84.6)	
No	219	70 (32.0)	149 (68.0)	
Permission				0.337
Not a barrier	265	76 (28.7)	189 (71.3)	
A barrier	19	4(21.1)	15 (78.9)	
Marriage certificate				0.001
Not a barrier	247	61 (24.7)	186 (75.3)	
A barrier	37	19 (51.4)	18 (48.6)	
Caretaker				0.269
Not a barrier	211	62 (29.4)	149 (70.6)	
A barrier	73	18 (24.7)	55 (75.3)	
Clinic distance				0.526
Not a barrier	221	62 (28.1)	159 (71.9)	
A barrier	53	18 (28.6)	45 (71.4)	

P<0.05, p-value from chi square

Respondents level of knowledge on antenatal booking

In the level of knowledge component, statistically late antenatal bookers had total mean score of 7.0 (2.28) and those who booked their pregnancy early had total mean score of 7.6 (1.75). Level of knowledge was discovered to have significant relationship with timing of antenatal booking (independent t test, $p < 0.05$). Those who booked their pregnancy late have lower level of knowledge on antenatal booking compared to those who initiated antenatal care early.

Table 3 Multivariate analysis of late antenatal booking

Characteristics	n= 284	Antenatal booking n (%)		Crude OR	Adjusted OR	95% CI		*p-value*
		Late	Early			Lower	Upper	
Current pregnancy being planned?								
Yes	167	32(19.2)	135(80.8)	1.00	-			

No	117	48(41.0)	69(59.0)	2.56	2.70	1.54	4.72	[a]0.001
Marriage certificate								
Not a barrier	247	61(24.7)	186(75.3)	1.00	-			
Barrier	37	19(51.4)	18(48.6)	3.02	3.02	1.40	6.51	[a]0.005
Past medical history								
Yes	55	9(16.4)	46(83.6)	1.00	-			
No	229	71(31.0)	158(69.0)	3.17	2.88	1.26	6.59	[a]0.012
Complication in previous pregnancy								
Yes	65	10(15.4)	55(84.6)	1.00	-			
No	219	70(32.0)	153(68.0)	2.37	2.34	1.10	4.99	[a]0.028
Marital status								
Married	263	68(25.9)	195(74.1)	1.00				
Not married	21	12(57.9)	9(42.1)	1.05		0.31	3.59	0.939
Ethnicity								
Malay	96	23(23.7)	74(76.3)	1.00				
Bidayuh	129	45(34.9)	84(65.1)	1.67		0.88	3.19	0.118
Others	58	12(20.7)	46(79.3)	0.90		0.38	2.16	0.817
Education status								
Primary or Lower	32	11(34.4)	21(65.6)	1.00				0.817
Secondary	231	67(29.0)	164(71.0)	0.64		0.08	4.99	0.667
Tertiary	21	2(9.5)	19(90.5)	0.56		0.09	3.60	0.541
Occupation								
Employed	86	18(20.9)	68(79.1)	1.00				
Unemployed	198	62(31.3)	136(68.7)	1.51		0.77	2.95	0.229
Family planning								
Yes	139	31(22.3)	108(77.7)	1.00				
No	145	49(33.8)	96(66.2)	1.70		0.83	3.48	0.150
Gravida								
Primigravida	77	26(33.8)	51(66.2)	1.00				
Multigravida	207	54(26.1)	153(73.9)	1.58		0.71	3.49	0.262

Model of chi square (df) = 36.09 (4) p-value < 0.001
n = 284
Hosmer and Lemeshow Test p-value = 0.826 > 0.05
CI = Confidence Interval
OR = Odd Ratio
[a]Multiple Logistic Regression (no multicollinearity, assumptions were all met)
Dependant variables = Timing of antenatal booking (late booking vs early booking)

Predictors of late antenatal booking

A binary regression model was applied to determine the predictors of late antenatal booking in the Lundu District of Sarawak. The timing of antenatal booking (dichotomous) was used as the dependent variable (late antenatal booking versus early antenatal booking), and selected socio-demographic characteristics, such as current obstetric status, past medical illness together with obstetric history and other barriers were assigned as the independent variables. Previous univariate analysis had shown that there are several factors which have a significant relationship with the timing of antenatal booking. After binary logistic regression analysis was performed, current pregnancy status (planned or unplanned), marriage certificate problems, past medical illness and complications in previous pregnancy appeared to be the significant factors *($p<0.05$*). Those who never planned to get pregnant (95% CI=1.54, 4.72) were 2.7 times more likely to book their pregnancy late, compared to those who planned it. The group of respondents who perceived marriage certificate issues as a barrier (95% CI=1.40, 6.51) were 3.02 times more at risk of late antenatal booking than those who did not regard this as a barrier. Those with no past medical history of medical illness (95% CI=1.26, 6.59) were 2.88 times more likely to book their pregnancy late than those with a history of medical illness. Pregnant mothers without a history of pregnancy complications (95% CI = 1.09, 4.99) were 2.34 times more likely to delay their antenatal booking, compared to those with a history of complications during pregnancy.

DISCUSSION

In Malaysia, late antenatal booking is defined as the initiation of pregnancy care at any health care facility (or Maternal and Child Health Clinic) after the 12th week of gestation. In this study, the prevalence of late antenatal booking in the Lundu District of Sarawak was 28.2%. This figure is lower than that in a study conducted in an ethnically diverse urban population in the United Kingdom[7]; and is also lower than that in a similar study in Myanmar[8] and Nigeria.[9] However, the figure in our study was higher than in developed countries such as Italy.[10] Maternal age was not a predictor of late antenatal booking in this study. The mean age of both early and late antenatal bookers was very similar, i.e. 27.9 (5.87) years of age for those who booked their pregnancy early and 26.5 (6.36) years of age for late bookers. This finding was not consistent with other studies elsewhere.[5,11] Older mothers tend to initiate their antenatal care early due to several factors. These include experience, level of knowledge and ability to make decisions. Marital status was discovered to be statistically significant in the timing of antenatal booking in this study. Unlike married women, single mothers were more prone to enter antenatal care late. Some even believed that, without a marriage certificate, they were not allowed to register their pregnancy at any health care facility. This incorrect belief proved to be risky because it affected the timing of antenatal booking. From this study it was noted that a higher percentage of unemployed women tended to be late antenatal bookers compared to their employed counterparts. "Unemployed" does not only refer to housewives, but also refers to single mothers who are unemployed, as well as students. Getting permission from a family member to visit a health care facility to initiate antenatal care was not an issue among women in Lundu District, unlike in other regions such as Nepal, India[14] and Uganda[20] where the husband was one of the people who had the most influence on the timing of respondents' decision to make an antenatal booking. However, statistically, there was no significant association between employment status and timing of antenatal booking. This was inconsistent with the findings from other developing countries, such as Ethiopia,[13] that reported that housewives were likely to book their pregnancy late as compared to other occupation groups.

Unplanned pregnancy was identified as the strongest predictor of late initiation of antenatal care. In this context, the term "unplanned pregnancy" can be applied to both married and unmarried women. In the case of married women, these are women who did not expect to conceive so soon, and in the case of unmarried women, these are women who were sexually active but did not expect to become pregnant. This finding was consistent with other studies around the world.[8,15] Our findings also demonstrated that women with a history of family planning use registered their pregnancy early. Women will stop their use of contraceptives when they plan to conceive, unless they have exceeded the childbearing age limit. They tend to be more aware and sensitive to any signs of early pregnancy. The finding that there was an association between the use of family planning and late antenatal booking was consistent with the findings from a community study in Kenya.[15] In this study, we also postulate that marriage certificate issues were one of the significant barriers for some women to register their pregnancy early. The marriage certificate could pose a problem for some couples, especially for those who only decide to get married once they have conceived. This might lead to a delay in the issuing of the marriage certificate. This situation can be very complicated in the case of a teenage pregnancy and much worse if it is a pregnancy outside wedlock. The stigma of being an unmarried mother deters some women from seeking earlier treatment or intervention. Negative public perception and discrimination towards these women must be addressed. Regardless of a woman's marital status, pregnancy care must be started early to protect both the unborn child and the mother. The Health Department's scope of services is not only restricted to an antenatal check-up and nursing care, but also includes social aspects, such as counselling and referral to the Social Welfare Department.

A history of past medical illness was found to have a significant relationship with late antenatal booking. Examples of medical illnesses reported by the respondents in this study were hypertension, diabetes mellitus, asthma, thyrotoxicosis and hypothyroidism. Those with a history of medical illness tended to register their pregnancy early because they were concerned that their co-morbidities might affect the outcome of their pregnancy. In addition, women of childbearing age who are undergoing a follow up for their medical illness would also be referred to Pre-Pregnancy Care (PPC) clinics if they intend to get pregnant. Early intervention enables these women to receive adequate and proper advice from medical health professionals prior to conception. During the consultation with a Pre-Pregnancy Care doctor, these high-risk women will be advised to book their pregnancy early once they become pregnant. The association found between a history of medical illness and the timing of antenatal booking was consistent with the findings from a study in Nigeria,[16] where it was found that a history of complications in a previous pregnancy influenced a considerable number of women to start their pregnancy check-up early. This outcome was supported by findings from Uganda,[17] but

another study conducted in Nigeria suggested otherwise.[9] The level of risk for a woman's current pregnancy can also be determined and affected by their history of past deliveries. Those who have a history of assisted delivery (vacuum delivery or forceps delivery) and cesarean section are categorized as high-risk mothers if they get pregnant again in the future. The method of past delivery did not contribute to late antenatal booking in this study. One study in Nigeria was consistent with this outcome.[18] In this study, a history of caesarean section was of no statistical significance in connection with late antenatal booking. The term "birth before arrival" is used in some literature to refer to home deliveries. Home deliveries are not a big concern in Malaysia when compared to certain countries in Africa

Respondents with a low level of knowledge about antenatal booking tend to register their pregnancy late. Also, the level of knowledge is also greatly influenced by the mother's socio-economic status such as education status, type of occupation and income. This finding was consistent with other studies in the world.[16,19] A lack of knowledge about antenatal booking could be due to women not being well informed about the importance of antenatal booking. Although we expected gravidity to be one of the predictors for late antenatal booking, our study did not support this. This finding was inconsistent with studies conducted elsewhere which postulated that those who had a history of delivery tend to visit antenatal care facilities early in the next pregnancy.[7,20] This group of pregnant mothers are given advice on the proper timing of antenatal booking once they have delivered in a health care facility.

This study has several limitations. One of these was that we did not include women who underwent follow-up in private health care facilities, as this study only covered government health care facilities. Furthermore, we could not rule out the possibility that some foreign women might have returned to their country of origin once they had conceived. This could be because health care subsidies are not extended to non-Malaysian citizens. Maternity fees could be too expensive for some foreign women, depending on their socio-economic status. A community-based study would be appropriate to capture those who were left out of this study. An interventional study is beneficial for testing the efficacy of intervention programs or activities. Another limitation is that we did not include those women who chose to have their delivery overseen by a traditional midwife. The role of traditional midwives is still significant in some parts of the country, especially in rural areas. The study design was cross-sectional, such that independent and outcome variables were collected simultaneously. Hence, associations could be identified, but causality could not be inferred.

CONCLUSIONS

According to this study, the prevalence of late antenatal booking in the Lundu District of Sarawak is lower than in most developing countries. Factors that were identified as being the cause of late antenatal booking were unplanned pregnancy, marriage certificate issues, and the absence of past medical illness and past obstetric complications. Detection of those who are unaware of their pregnancy could be improved by expanding the role of current community health programs. The scope of mobile clinics or home nursing could be extended to detect those who are at risk of getting pregnant. Correct and appropriate information can be obtained from family planning clinics. The public should be made aware of the importance of early entry into antenatal care. These messages could be delivered both via mass media and social media. It is also important for the general population to know that documents such as a marriage certificate are not a prerequisite for obtaining antenatal care. These documents might be necessary for registration purposes, but any pregnant woman has the right to receive health care regardless of whether they are legally married or not. Women without a history of obstetric complications or any medical illness should not be overlooked. It is customary practice in Malaysia to counsel women upon discharge from the maternity ward to space their pregnancies. There is a variety of contraceptive methods which can be recommended by primary health care facilities. However, it is also vital to advise those who are planning to conceive again to book their next pregnancy early. This information should be delivered during the postnatal routine check-up or home visit.

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