KKU Journal for Public Health Research
Vol.9 No.3 July - September 2016

วารสารวิจัยสาธารณสุขศาสตร์ มหาวิทยาลัยขอนแก่น
ปีที่ 9 ฉบับที่ 3 เดือน กรกฎาคม – กันยายน 2559

Original Article

Barrier of Utilization of ANC Services in Rural Communities, Nepal

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Received Date: December 15, 2016
Accepted Date: January 6, 2017

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Abstract

In Nepal, the levels of maternal and infant morbidity and mortality are among the highest in the world. Antenatal care (ANC) is one of the key preventive health services used to prevent maternal mortality and morbidity around the world. Therefore, to reduce maternal mortality and morbidity, increasing use of reproductive and maternal health services is essential. This study was conducted with the objectives of determining the prevalence of utilization of maternal health care services and identifying factors affecting it. A community-based, cross-sectional study was conducted in Banke District in the Mid-Western Development Region (one of the five development regions of the country) from April to May 2016. A multi-stage sampling technique was used to select the study population in six village development communities (VDC). A total of 364 women in the age range 15-49 years were interviewed. The author used bivariate statistics and multivariate logistic regression. Overall, over half (56%) of the women had at least four ANC visits; 39% had one to three ANC visits and 5% had no ANC visits during their last pregnancy. The study found that religion, family support, information from TV, quality of service, travel and service cost, satisfaction with the ANC service and negative perception were significant barriers to utilization of ANC services. In particular, women who were not Hindus and incurred a high travel and service cost had statistically significant higher barriers to ANC services utilization compared to those who were Hindu and experienced low travel and service cost. Based on the findings of this study, reducing the barriers to ANC services utilization will require targeting women in the rural areas and non-Hindus, in addition to creating demand for delivery at a health facility. Improving ANC use by making it available and accessible will have a multiplier effect of improving facility-based deliveries and reducing barriers to ANC services utilization.

Keywords: *Barrier, ANC Services, Rural Communities, Nepal*

นิพนธ์ต้นฉบับ

อุปสรรคของการมารับบริการฝากครรภ์ในเขตชนบทของประเทศเนปาล

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บทคัดย่อ

ในประเทศเนปาลเป็นประเทศที่มีอัตราการเจ็บป่วยและเสียชีวิตของมารดาและทารกมากที่สุดในระดับโลก การฝากครรภ์ (ANC) เป็นหนึ่งในบริการสุขภาพเชิงป้องกันที่สำคัญที่ใช้ในการป้องกันไม่ให้เกิดการตายและเจ็บป่วยของมารดาและทารกทั่วโลก ดังนั้นเพื่อลดการตายของมารดาและการเจ็บป่วย การเพิ่มขึ้นของการบริการอนามัยการเจริญพันธุ์และมารดาจึงเป็นสิ่งจำเป็น จึงเป็นที่มาของการศึกษาในครั้งนี้ โดยมีวัตถุประสงค์เพื่อศึกษาความชุกของการมารับบริการฝากครรภ์ของมารดาและอุปสรรคต่อการมารับบริการ ใช้การศึกษาเชิงสำรวจแบบภาคตัดขวาง โดยดำเนินการในตำบลเบงเก ในพื้นที่ชนบทส่วนกลางของภูมิภาคตะวันตก (หนึ่งในห้าของพื้นที่ที่เป็นพื้นที่การพัฒนาของประเทศ) เก็บรวบรวมในช่วงเดือนเมษายน-พฤษภาคม 2559 ใช้เทคนิคการสุ่มตัวอย่างแบบหลายขั้นตอน ผู้วิจัยสุ่มหมู่บ้าน (VDC) จำนวน 6 หมู่บ้าน และสุ่มตัวอย่างที่เป็นผู้หญิงที่มีบุตรอายุต่ำกว่า 1 ปี และมีอายุในช่วง 15-49 ปี จำนวน 364 ราย ใช้สถิติ bivariate และการถดถอยโลจิสติกหลายตัวแปร ผลการศึกษาพบว่ามากกว่าครึ่งหนึ่ง (56%) มารับบริการฝากครรภ์ตามเกณฑ์ที่กำหนดโดยองค์การอนามัยโลก (อย่างน้อย 4 ครั้งตามกำหนด) ร้อยละ 39 มารับบริการฝากครรภ์น้อยกว่าเกณฑ์ที่กำหนดโดยองค์การอนามัยโลก (มารับบริการฝากครรภ์ 1-3 ครั้ง) และร้อยละ 5 ไม่มารับบริการฝากครรภ์ นอกจากนี้ยังพบว่าปัจจัยด้านการนับถือศาสนา การไม่ได้รับการสนับสนุนจากครอบครัว การไม่ได้รับข้อมูลข่าวสารจากทีวี คุณภาพของการบริการไม่ดี มีค่าใช้จ่ายการเดินทางและบริการสูง ไม่มีความพึงพอใจกับการบริการฝากครรภ์ และการรับรู้เชิงลบเป็นอุปสรรคสำคัญในการใช้ประโยชน์จากบริการฝากครรภ์ โดยเฉพาะผู้หญิงที่ไม่ได้นับถือศาสนาฮินดูซึ่งเป็นศาสนาของพื้นที่ที่ศึกษา มีค่าใช้จ่ายในการเดินทางและค่าใช้จ่ายบริการที่สูง เป็นปัญหาและอุปสรรคที่สำคัญอย่างมีนัยสำคัญทางสถิติ เมื่อเทียบกับผู้หญิงที่นับถือศาสนาฮินดู และมีต้นทุนในการเดินทางและค่าใช้จ่ายบริการที่ไม่ต่ำกว่า จากผลการวิจัยของการศึกษานี้ช่วยลดอุปสรรคในการมารับบริการฝากครรภ์ในกลุ่มเป้าหมายคือผู้หญิงในพื้นที่ชนบทและผู้หญิงที่ไม่ได้นับถือศาสนาฮินดู จึงควรต้องมีการปรับปรุงบริการฝากครรภ์ให้เอื้ออำนวย ความสะดวก และควรที่จะให้มีบริการฝากครรภ์ที่เข้าถึงกลุ่มเป้าหมาย จึงจะสามารถลดอุปสรรคในการรับบริการฝากครรภ์ ทำให้อัตราการเจ็บป่วยและเสียชีวิตของมารดาและทารกในประเทศเนปาลลดลง

คำสำคัญ: *อุปสรรค, บริการฝากครรภ์, ชุมชนชนบท, ประเทศเนปาล*

Introduction

According to the World Health Organization [WHO] (2013), worldwide, 292,982 women lost their lives due to complications related to pregnancy and child birth in a single year. This translates into 830 women dying each day because of these complication. Despite a 44% reduction in maternal deaths between 1990 and 2015 (WHO, 2015), maternal mortality is currently a major health problem globally. In 2000, the United Nations adopted the Millennium Declaration, and set eight Millennium Development Goals (MDG) (WHO, 2005). The fifth MDG aimed to reduce the maternal mortality ratio (MMR) by three-quarters by 2015, by improving the proportion of births attended by skilled health personal and providing universal access to ANC (WHO, 2007).

WHO has estimated that 90% of deaths related to pregnancy complication occurred in low- and middle-income countries, and one-third of them are in South Asia. In developing countries, maternal mortality still remains the leading cause of death among reproductive age women (Lynch, 2006). The most common causes of maternal death are severe bleeding (haemorrhage), hypersensitivity (pre-ecalmpsia and ecalmpsia) disorder, infections and unsafe abortion (Khan et al., 2006). Despite moderate success in reducing the MMR and increasing ANC coverage, the global targets associated with MDG 5 seem unlikely to be met by 2015, particularly in low- and middle-income countries (LMICs) where maternal mortality is high or very high. Maternal deaths are not uniformly distributed throughout the world, and are highest in sub-Saharan Africa and South Asia; developing countries share an unequal burden of maternal deaths worldwide (Kassebaum et al., 2014; WHO, 2013).

Interventions that can be routinely scheduled, such as immunization and ANC had much higher coverage than those that rely on functional health systems such as 24-hour availability of clinical services, skilled or emergency care at birth, and care of ill newborn babies and children. Coverage of different interventions varies widely, both between and within countries. Data for postnatal care were either unavailable or showed poor coverage in all 68 countries. The most rapid increase in coverage was seen for immunization, as it received significant investment during this period (Bryce et al., 2008).

ANC is one of the key health services used to prevent maternal mortality and morbidity around the world. Therefore, to reduce maternal mortality and morbidity, increasing use of reproductive and maternal health services is essential. Maternal health care means providing health care to women during their pregnancy, childbirth and immediately post-partum for the wellbeing of mother and newborn (Tucker et al., 1996). ANC is an important component of maternal health which helps to identify the complications and risk factors during pregnancy and also helps to plan a safe delivery. WHO recommends a minimum of four ANC visits during the 4th, 6th or 7th, 8th and 9th months of pregnancy. However, WHO figures show that, between 2005 and 2010, only 53% of pregnant women worldwide attended the recommended four ANC visits (Lincetto & Munjanja, 2010). In low-income countries the figure was a disappointing 36%. Despite a huge international effort to promote and provide ANC, there has been little improvement in these statistics over the past decade. Therefore, it is important to investigate the factors related to poor ANC attendance (Finlayson & Downe, 2013).

The Federal Democratic Republic of

Nepal is a developing country in South Asia with area of 147,181 square kilometers and population of around 28 million. It is located in the lap of the Himalayas, and borders China to the north and India to the south, east, and west (Central Bureau of Statistics, National Planning Commission Secretariat, Government of Nepal, 2012). Nepal still lacks precise data on maternal mortality, however the available data suggest that there is still high maternal mortality. The civil registration system of births and deaths is helpful but, in the absence of active case finding, may be misleading. For example, if the death registration form does not include a specific identifier of maternal death, then maternal deaths may be missed or misclassified (van den Broek & Falconer, 2011).

Nepal has a high maternal mortality ratio (229 per 100,000 live births) which can be reduced with appropriate interventions (Finlayson & Downe, 2013). Under-utilization of health services is one factor contributing to this. Only one-third of births occur in health facilities and only 50% women have the minimum of four recommended ANC visits (Ministry of Health and Population, Government of Nepal, 2012). Under half (47%) of the deliveries conducted at home are by a skilled birth attendant, and one-third are delivered at a health facility with a trained attendant. One out of five women delivered at home without a trained health worker (Pradhan et al., 2013). In Nepal, only 40% women received any ANC from a skilled professional (NDHS, 2011). According to the Nepal Demographic and Health Survey (NDHS) in 2001, 65% of women received ANC in the Terai zone while only 23% received ANC in the Hill and Mountain zones. Overall, in the NDHS 2011 survey, 80% of women in the Terai zone utilized ANC services, while only 50% or women in the Hill and Mountain zones received ANC. Utilization of ANC services across the ecological zone is due to the differences in education, occupation, religion, wealth index, and access to media (Tripathi & Singh, 2015). Almost all (98%) pregnant urban women had at least one ANC visit, however only half of rural woman had ANC. About half (48%) of women delivered within five hours of reaching a health care facility and 90% delivered within 25 hours of arrival (Karkee, Binns, & Lee, 2013).

A study of ANC in Nepal found that attending four ANC visits was positively associated with skilled birth attendants (SBA) utilization (Choulagai et al., 2013) -- however that study included women who delivered in the last 24 months or more, rendering the findings prone to recall bias (Matthews & Gubhaju, 2004; Pradhan et al., 2013). In addition, attending four ANC visit was found to be positively associated with SBA utilization (Choulagai et al., 2013). Thus, it is important to understand the factors related to more or less ANC coverage. Therefore, this study aims to identify factors related to achieving four ANC visits among women who delivered within the last 12 months prior to the survey in Village Development Communities (VDC) of Banke District, Nepal.

According to 2014 statistics, two-thirds (69%) of women in the mid-western region had received ANC service, however only 39% had four ANC visits in the last pregnancy (Ministry of Health and Population, Government of Nepal, 2012). In Banke District in 2014, having at least one ANC visit decreased to 90.3% from 93.5% in 2013. Among these woman only half (51.7%) had all four ANC visits in 2014 compared to 47.7% in 2013, (Department of Health Services, Ministry of Health and Population, Government of Nepal, 2014b). This shows that, while the

ANC caseload is decreasing slightly, completeness of ANC is on an upward trend in Banke District of Nepal.

Many research studies suggest that, along with supply and demand for health resources, individual and household factors, socio-cultural factors (e.g., women's autonomy) (Pallikadavath, Foss, & Stones, 2004), caste/ ethnicity, religion and beliefs (Sharma, 2004), and women's media exposure regarding pregnancy and health care (Navaneetham & Dharmalingam, 2002) influence health-seeking behavior. For example some ethnic group women are not allowed to go for ANC. Furthermore, socio-cultural factors are contextual and entrenched (Okolocha et al., 1998) and amplify geographical and financial barriers experienced by women to access maternal health services (Hodge et al., 2015). Many studies have documented poor utilization of institutional delivery by the Terai's (planning region) Muslims and Dalit's communities (Sharma, Sawangdee, & Sirirassamee, 2007; Furuta & Salway, 2006). A qualitative study conducted in Nepal showed that the heavy work-load of pregnant women, the mother-in-law's perception of benefit of ANC, a woman's power and control over resources, and relationship between the mother-in-law and pregnant woman play a vital role in a pregnant women's utilization of ANC (Simkhada, Porter, & van Teijlingen, 2010). However, the role of socio-cultural factors, including ethnicity, women's status, education, exposure to media and other demographic and economic factors affecting utilization of ANC services remain under-investigated in rural communities of Nepal.

This study was conducted to identify the prevalence and the factors associated with utilization of ANC services among mothers of children under one year of age in rural communities in Nepal.

Research methodology

- **Research design**

This was a community-based, cross-sectional study to determine factors related to regular use of ANC services in rural communities of Banke District, Nepal. The dependent variable was the utilization of ANC services in the last pregnancy by mothers who have a child under one year of age. The independent variables were hypothesized determinants of ANC utilization (i.e., predisposing, enabling and reinforcing factors) based on the Precede-Proceed Model.

- **Study area**

Health institutions in rural communities of Banke District were randomly selected. Banke District belongs to the Mid-Western Development Region, one of the five development region of the country. The total area of the district is 2,337 square kilometers. The district is composed of 46 VDC and one municipality with a total population of 512,222 (Central Bureau of Statistics, National Planning Commission Secretariat, Government of Nepal, 2012). This district borders with Surket, Salyan, and Dang to the north, Uttar Pradesh of India to the south and Bardiya District to the west. Banke District had 17,480 registered pregnancies in 2014 (source: DPHO Banke 2014). Banke has one government health institution, one zonal hospital, three primary health care centers, 20 health posts, and 24 sub-health posts. There is outreach from these outlets conducted by mid-level and grass roots health workers (Department of Health Services, Ministry of Health and Population, Government of Nepal, 2014a).

- **Population and sampling technique**

The target population of the study is married women of reproductive age (18-49 years) who had at least one child within the prior 12 months in a rural community of Banke

District. The sample size required for this study was calculated using the Krejcie and Morgan Formula. A multi-stage cluster sampling method was used in the sampling procedure in this study in order to obtain information about ANC services used in Banke District. Firstly, six VDC were randomly selected out of 46 VDC in Banke District on the basis of low ANC coverage in that area. Next, staff of the sub-health post/ health post provided lists of mothers of children born and immunized during the last year. Lastly, women who had delivered within the past year and consenting to participate, were interviewed. Data from the Banke District Health Office recorded 2,425 pregnant women in the six sampled VDC in 2014.

The inclusion criteria is married women of reproductive age (18-49 years) who had at least one child age under one year old, who can communicate with the researcher and are willing to participate in the study. The exclusion criteria is mothers who cannot communicate with the interviewer or have a hearing impairment. The prescribed sample size was increased by 10% to allow for incomplete data or withdrawal of participants. The final sample size is 364.

- **Instrument and Variables**

The questionnaire was developed by the researcher according to the research objectives, literature review, and theoretical framework of the study using the Precede-Proceed Model. The questionnaire consisted of the following four parts:

Socio-demographic factors: there were ten questions on socio-demographic status of postpartum women such as age, women's education, women's occupation, husband's education, husband's occupation, family income, ethnicity and caste. Age of the women was grouped into three categories based on the Nepal Ministry of Health and Population: 18-20 years, 20-35 years, and 36 to 43 years. Education status of women and husband were categorized into six groups: no education, primary school, secondary school, higher secondary, university/college and vocational training. Occupational status of women and husband were categorized into five groups: jobless, government job, private job, agriculture work (males) and housewife (females). Monthly household income was categorized into four groups: low income (rs. 500 to 10,000), medium income (rs.11000 to 20,000 rs,) medium-high income (rs.21,000 to 30,000) and high income (>rs.31,000) where rs.108=1$. Religion was divided into four categories: Hindu, Buddhist, Muslim, and Christian. Caste was divided into Brahmin, Chhetri, Janajati, Dalit, and other.

Predisposing factors: This part consisted of 18 questions including cultural factors, experience of past delivery, obstruction/complications in past delivery and during pregnancy, delivery status and family size. Knowledge consisted of nine true/false questions (scored from zero to nine) with mean value of less than seven denoting "poor knowledge" and seven or higher denoting "good knowledge" of ANC services. Perception had nine questions, with each having response options of "agree", "undecided" and "disagree" and scored for "poor" and "good" perception.

Enabling factors: This part consists of ten questions including accessibility to ANC services, time of first visit, services availability, environmental condition, quality of ANC services, satisfaction with ANC services, distance between the health center and home, traveling cost, waiting time, and whole time spent for each visit.

Reinforcing factors: This part consists of 19 questions including (a) Source of information on ANC (mass media, magazines, brochures, internet,

television, radio, mobile phone, the Female Community Health Volunteer (FCHV), friend, local leader, relative and health worker). (b) Support from husband/family includes social support from husband or family about ANC services in terms of information, encouragement, advice, money and participation/help with the ANC checkup.

The outcome/dependent variable for this investigation is ANC utilization. This variable is a trichotomy taking the value of '2' if the woman has had at least four ANC visits, '1' if the woman has had one to three ANC visits or '0' if she did not have ANC.

- **Data collection and analysis**

Data were collected using a questionnaire developed by the researcher according to the research objectives and based on the Precede-Proceed Model. The questionnaire was tested for content validity and then translated into Nepali before conducting a pre-test among 30 cases with similar characteristics as the intended sample. The reliability of the questionnaire was tested by using the Kuder-Richardson (KR) Formulae 21 and Cronbach's Alpha Coefficient for knowledge and perception, respectively. The KR 21 for knowledge was 0.83 and Cronbach's Alpha for perception was 0.90.

Data collection from mothers of children under one year old was done by face-to-face interview by the researcher and interviewers using a structured questionnaire. Before obtaining consent, the respondents were informed about the purpose of the study, procedure of maintaining confidentiality, and the academic use of the findings.

1) After receiving approval from the Mahidol Ethical Review Board, the researcher introduced the study to the head of the Banke District Public Health Office to seek permission for the study.

2) The district office then issued a letter to each of the sample VDC to request cooperation.

3) No respondents were forced to participate in this study.

Data were analyzed using SPSS Software Program (version 16) including descriptive statistics (e.g., frequencies, percentage, median, mean and standard deviation) and logistic regression, with the level of confidence set at $p<0.05$.

Results

- **Prevalence of 4 ANC Coverage**

Figure 1 shows data on history of ANC at last pregnancy. Only 5% of the sample had no ANC, while 39% had less than the WHO-recommended four ANC check-ups, while 56% had four or more ANC visits.

- **Characteristics of the respondents**

The mean age of the women in this sample was 27 years, with 13% under age 20, and 7% over age 35. Fully 86% of the women had completed less than high school education, while 55% of their husbands had less than high school education. Most of the women were housewives, while over half of their husbands were farmers. Three-fourths had household income below the mean, and about half of the women were members of the Chhetri caste. Most of the sample were Hindu (see Table 2).

- **Percent distribution of ANC service utilization by women's characteristics**

Women under age 21 or over 35 years are considered to have elevated risk of complications of pregnancy and/or delivery, and it is alarming that these groups of women had no ANC or less than the recommended four ANC check-ups than women in the lower-risk age groups. Also, more of the less-educated women had no/less than the recommended ANC check-ups. Nearly

all the women who did not go for ANC were housewives or farmers. Three-fourths of husbands of women with no ANC at last pregnancy were farmers. Similarly, women with no history of ANC at last pregnancy (or less than the WHO-recommended four check-ups) had lower household income than the average. In Nepal, the Brahmin/Chhetri caste are higher status than the Dalit/ Janajati/other castes. Accordingly, fewer Brahmin/Chhetri women in this sample had a history of no ANC than women in the lower castes. About two-thirds of the Brahmin/Chhetri women had received four or more ANC check-ups during the last pregnancy. Fewer Hindu had no/less than the recommended ANC than other religious adherents.

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Women who had less family support also had a higher proportion with no ANC than women with more family support. However, there were no differences for family support for those with four or more or one to three ANC check-ups. Women with no history of ANC received less/no information on ANC from the media. That said, over 80% of the sample had good awareness of ANC. There was no significant difference in the knowledge of women who completed four or more ANC visits compared to those who hadn't. Two-thirds of the women with no ANC did not receive positive/motivational information about ANC.

About one-third of the women with complications during the last pregnancy had not gone for ANC, and a similar percent had less than four ANC check-ups. Women with four or more ANC visits reported that the attending staff were good quality. Those with less/no ANC reported a lower quality of attending staff. There was no difference in perception of the environment around the service facility for the different groups of women by ANC coverage, and two–thirds felt the environment was favorable.

More women with no ANC lived more than five km from the ANC outlet, waited more than 30 minutes for service and incurred a cost of over 50 Rs to attend ANC than women who had some/complete ANC. (Table 3)

- **Univariate and multivariate analyses of barriers to antenatal care utilization**

The authors analyzed factors which impeded women from going for ANC during the last pregnancy. The findings, shown in Table 4, are that non-Hindu women are 12 times more likely

to have no ANC than Hindu women (AOR=12.10, 95% CI=3.71-39.52). Women who incurred no costs in attending ANC were 14 times less likely to have no ANC than women who incurred costs (AOR=14.55 95% CI=2.22-95.28). Women with little family support to attend ANC were four times more likely to have no ANC than women whose family was supportive (AOR=4.15, 95% CI=1.04-16.56). Similarly, women who did not receive information from the media about ANC were four times more likely to have no ANC than women who did receive information (AOR=3.77, 95% CI=1.29-11.03). Women who viewed the attending staff as not good quality (AOR=4.62, 95% CI=2.34-19.54) were not satisfied with the service (AOR=3.89, 95% CI=1.60-6.92) and received negative information about ANC (AOR=4.26, 95% CI=1.08-17.89) were four times more likely to have no ANC than women who viewed the attending staff and service as good and received positive information about ANC. (Table 4)

Discussion

This study found that 95% of participants utilized ANC services during their last pregnancy. This result is slightly higher than a study from Nigeria which found that 91% of women utilized ANC services from a skilled ANC provider (Karkee, Binns, & Lee, 2013). This study found that 56% of women had four or more ANC check-ups during the last pregnancy. This result is lower than a study in Indonesia which found that 66% of women had the four recommended ANC check-ups (Kassebaum et al., 2014; Choulagai et al., 2013). Education did not show any association with utilization of ANC services, and this is similar to a study in Pakistan (Nisar & White, 2003). Women's education emerged as a key factor in a qualitative study leading to an appreciation of the importance of ANC (Mumtaz & Salway, 2005). In contrast, some studies found that women's education was the best predictor of ANC visits. Women with better education were more likely to receive the recommended number of ANC visits (Nielsen et al., 2001; Erci, 2003). Educated women are more likely to start ANC visits early than less educated women (Matsumura & Gubhaju, 2001). Women's age was not a significant predictor of utilization of ANC, and this finding is similar to some other studies (Adamu & Salihu, 2002; Celik & Hotchkiss, 2000; Griffith & Stephenson, 2001). Women whose husband worked as a local farmer had a higher level of ANC utilization compared to women whose husband worked outside the community. Women with one or more complications in the last pregnancy reported having ANC check-ups more often. A positive perception about ANC also was associated with increased ANC visits. These data are consistent with another study in the Eastern Terai region about ANC knowledge, complications and ANC visits (Matthews & Gubhaju, 2004).

Many studies identified cost as a barrier for poor people in developing countries. Cost of accessing care (travel cost, service fees, equipment cost) is an important determinant of whether to seek care or not, especially where distances to healthcare facilities are large. The financial constraints are reinforced in settings where local customs and values deny women the right to travel alone or to be in the company of men outside their immediate family (WHO, 2007). Women with higher living standards may also have better access to mass media informing them of the benefits of ANC (WHO,. 2013).

Access and availability are key concerns as potential barriers to ANC utilization. Transportation to distant healthcare facilities may discourage women because of both the time taken and costs involved. Distance to healthcare facilities

is important even in developed countries; women living farther away are less likely to use healthcare facilities (Mathole et al., 2004). Although there is some debate in the literature about location and the use of ANC, most studies found that rural women are less likely to use ANC than urban women. Pregnant women may find it difficult to travel in rural areas especially when the condition of the roads is poor. Shortages of skilled attendants are common throughout developing countries, especially in rural areas. In general, there is a lack of adequate staff in rural areas compared with cities (Mumtaz & Salway, 2005).

None of the selected studies examined women's satisfaction with ANC and, thus, we do not know whether usage is related to satisfaction with the experience in developing countries. Yet satisfaction is a major determinant of health service utilization in general (Mathole et al., 2004). Patient satisfaction, as a component of quality of care, has been given high priority in maternity care in developed countries (van Teijlingen et al., 2003). Lack of satisfaction with quality of care could be a major demotivating factor in the use of maternity care facilities. Complaints about the services offered in Kenya include shortage of drugs and essential supplies, lack of commitment by staff, poor quality of food and lack of cleanliness (Peabody et al., 2006). Only one study has looked at the effect of the quality of services on their uptake, reported negative attitudes of healthcare workers and poor relations between healthcare workers and women as major barriers. The recent neglect of quality of care in developing countries is now being addressed (Simkhada et al., 2008).

This study found that women who were not Hindu faced a statistically significant higher barrier to ANC services utilization compared to Hindu women. However, it is unclear whether religion and caste/ethnicity play an important role in ANC utilization, perhaps because the issues are so varied and the instruments used to examine them differ. Muslim women are less likely to use reproductive and sexual health services such as family planning because of lack of privacy (Mishra, 2004) and exposure of legs and arms, which is embarrassing for Muslim women. However, Muslim women have relatively high ANC use despite this cultural belief (Simkhada et al., 2008). Women in some cultures do not use ANC because of the perception that the modern healthcare sector is intended for curative services only (Simkhada et al., 2006). As cultural beliefs and ideas about pregnancy have an influence on women's use of ANC, it would be appropriate to explore how issues in the Muslim culture and beliefs may act as barriers to use of some reproductive healthcare services.

Conclusions and recommendation

ANC visitation increases with decreased distance from the health center, decreased travel cost, decreased waiting time for service, increased quality of ANC services and increased satisfaction of services. Women whose husband works as a local farmer increases ANC visits compared to women whose husband works outside the community. Women with one or more complications are likely to go for ANC more often. Furthermore, increasing the positive perception about ANC also increases ANC visitation. Advice and information from the local FCHV and TV helps to increase ANC visitation.

The main barriers to utilization of ANC services among lower-income, rural Nepalese women are distance from the health center, travel cost, waiting time and satisfaction of service. Perception also plays a key role in service utilization

In planning appropriate maternity services, policy makers have to consider whether these services are affordable and accessible to rural, lower-income Nepalese women.

Limitations of the study

This study has a small sample size. Furthermore, a researcher-developed questionnaire was used with minimal reliability and validity testing, and this may lead to selection bias. On the other hand, the ambiguous questions on availability of ANC service, knowledge and perception need to be clearer if those items are to be used for the next study. Based on our findings, there is a need to improve the knowledge and perception items in the questionnaire, and increase the sample size in order to generalize findings.

Previous research has documented the need for increasing awareness of women's health, especially increasing the number of ANC visits during pregnancy, and conducting health education and health promotion. However, this research contributes to understanding the determinants of ANC visitation among Nepalese woman and factors affecting their decision to seek ANC in a rural area of Nepal.

Acknowledgement

I wish to thank the MOHP in Nepal, Mahidol University, and the Banke District Public Health Office, Nepal. I am especially grateful to Mr. Basanta Gaire for advice and coordination in connection with the data collection.

References

Adamu, Y. M., & Salihu, H. M. (2002). Barriers to the use of antenatal and obstetric care services in rural Kano, Nigeria. **Journal of Obstetrics & Gynaecology, 22**(6), 600–603.

Bryce, J., Daelmans, B., Dwivedi, A., Fauveau, V., Lawn, J. E., Mason, E.,.et al. (2008). Countdown to 2015 for maternal, newborn, and child survival: the 2008 report on tracking coverage of interventions. **Lancet, 371**(9620), 1247–1258.

Celik, Y., & Hotchkiss, D. R. (2000). The socio-economic determinants of maternal health care utilisation in Turkey. **Social Science & Medicine, 50**(12), 1797–1806.

Central Bureau of Statistics, National Planning Commission Secretariat, Government of Nepal. (2012). **National population and housing census 2011 (National Report).** Retrieved March 13, 2017, from https://unstats.un.org/unsd/demographic/sources/ census/wphc/Nepal/Nepal-Census-2011-Vol1.pdf

Choulagai, B., Onta, S., Subedi, N., Mehata, S., Bhandari, G. P., Poudyal, A., et al. (2013). Barriers to using skilled birth attendants' services in mid- and far-western Nepal: a cross-sectional study. **BMC International Health and Human Rights, 13**, 49.

Department of Health Services, Ministry of Health and Population, Government of Nepal. (2014b). **Annual report: Department of Health Services 2070/71 (2013/2014).** Retrieved March 13, 2017, from http://dohs.gov.np/wp-content/uploads/2014/04/ Annual_Report_2070_71.pdf

Department of Health Services, Ministry of Health and Population, Government of Nepal. (2014a). **Annual report Department of Health Services 2069/70 (2012/2013).** Retrieved March 13, 2017, from http://dohs.gov.np/wp-content/uploads/2014/04/ Annual_Report_2069_70.pdf

Erci, B. (2003). Barriers to utilization of prenatal care services in Turkey. **Journal of Nursing Scholarship, 35**(3), 269–273.

Finlayson, K., & Downe, S. (2013). Why do women not use antenatal services in low- and middle-income countries?: A meta-synthesis of qualitative studies. **PLoS Medicine, 10**(1): e1001373.

Furuta, M., & Salway, S. (2006). Women's position within the household as a determinant of maternal health care use in Nepal. **International Family Planning Perspectives, 32**(1), 17–27.

Griffith, P., & Stephenson, R. (2001). Understanding users' perspectives of barriers to maternal health care use in Maharashtra, India. **Journal of Biosocial Science, 33**(3), 339–359.

Hodge, A., Byrne, A., Morgan, A., & Jimenez-Soto, E. (2015). Utilisation of health services and geography: deconstructing regional differences in barriers to facility-based delivery in Nepal. **Maternal and Child Health Journal, 19**(3), 566–577.

Karkee, R., Binns, C. W., & Lee, A. H. (2013). Determinants of facility delivery after implementation of safer mother programme in Nepal: a prospective cohort study. **BMC Pregnancy And Childbirth, 13**, 193.

Kassebaum, N. J., Bertozzi-Villa, A., Coggeshall, M. S., Shackelford, K. A., Steiner, C., Heuton, K. R., et al. (2014). Global, regional, and national levels and causes of maternal mortality during 1990-2013: A systematic analysis for the Global Burden of Disease Study 2013. **Lancet, 384**(9947), 980–1004.

Khan, K. S., Wojdyla, D., Say, L., Gülmezoglu, A. M., & Van Look, P. F. A. (2006). WHO analysis of causes of maternal death: A systematic review. **Lancet, 367**(9516), 1066–1074.

Lincetto, O., & Munjanja, S. (2010). **Opportunities for Africa's newborns.** Geneva: World Health Organization.

Lynch, C. B. (2006). **A Textbook Of Postpartum Hemorrhage: A Comprehensive Guide To Evaluation, Management And Surgical Intervention.** Duncow: Jaypee Brothers Publishers.

Mathole, T., Lindmark, G., Majoko, F., & Ahlberg, B. M. (2004). A qualitative study of women's perspectives of antenatal care in a rural area of Zimbabwe. **Midwifery, 20**(2), 122–132.

Matsumura, M., & Gubhaju, B. (2001). Women's status household structure and the utilisation of maternal health services in Nepal. **Asia-Pacific Population Journal, 16**(1), 23–44.

Matthews, S. A., & Gubhaju, B. (2004). **Contextual influences on the use of antenatal care in Nepal: DHS Geographic Studies 2.** Retrieved March 13, 2017, from https://dhsprogram.com/pubs/pdf/SAR6/GS2.pdf

Ministry of Health and Population, Government of Nepal. (2012). **2011 Nepal demographic and health survey: Key findings.** Nepal: Ministry of Health and Population, New ERA and ICF International.

Mishra, V. K. (2004). **Muslim/non-Muslim differentials in fertility and family planning in India.** Retrieved March 13, 2017, from http://scholarspace.manoa.hawaii.edu/handle/10125/3749

Mumtaz, Z.. & Salway, S. (2005). I never go anywhere: extricating the links between women's mobility and uptake of reproductive health services in Pakistan. **Social Science & Medicine, 60**(8), 1751–1765.

Navaneetham, K., & Dharmalingam, A. (2002). Utilization of maternal health care services in Southern India. **Social Science & Medicine, 55**(10), 1849–1869.

Nielsen, B. B., Hedegaard, M., Liljestrand, J., Thilsted, S. H., & Joseph, A. (2001). Characteristics of antenatal care attenders in a rural population in Tamil Nadu, South India: A community-based crosssectional study. **Health & Social Care in the Community, 9**(6), 327–333.

Nisar, N., & White, F. (2003). Factors affecting utilization of antenatal care among reproductive age group women (15-49 years) in an urban squatter settlement of Karachi. **The Journal of the Pakistan Medical Association, 53**(2), 47–53.

Okolocha, C., Chiwuzie, J., Braimoh, S., Unuigbe, J., & Olumeko, P. (1998). Socio-cultural factors in maternal morbidity and mortality: a study of a semi-urban community in southern Nigeria. **Journal of Epidemiology and Community Health, 52**(5), 293–297.

Pallikadavath, S., Foss, M., & Stones, R. W. (2004). Antenatal care: provision and inequality in rural north India. **Social Science & Medicine, 59**(6), 1147–1158.

Peabody, J. W., Nordyke, R. J., Tozija, F., Bertenthal, D. S., McCulloch, C. E., DeSalvo, K. B., et al. (2006). Quality of care and its impact on population health: A crosssectional study from Macedonia. **Social Science & Medicine, 62**(9), 2216–2224.

Pradhan, P. M. S., Bhattarai, S., Paudel, I. S., Gaurav, K., & Pokharel, P. K. (2013). Factors contributing to antenatal care and delivery practices in Village Development Committees of Ilam District, Nepal. **Kathmandu University Medical Journal, 11**(41), 60–65.

Pradhan, P. M. S., Bhattarai, S., Paudel, I. S., Gaurav, K., & Pokharel, P. K. (2013). Factors contributing to antenatal care and delivery practices in Village Development Committees of Ilam district, Nepal. **Kathmandu University Medical Journal, 11**(41), 60–65.

Sharma, B. (2004). Utilisation of antenatal care services in Nepal. **Nepal Population Journal, 11**(10), 79-97.

Sharma, S. K., Sawangdee, Y., & Sirirassamee, B. (2007). Access to health: women's status and utilization of maternal health services in Nepal. **Journal of Biosocial Science**, **39**(5), 671–692.

Simkhada, B. D., van Teijlingen, E. R., Porter, M., & Simkhada, P. (2006). Major problems and key issues in maternal health in Nepal. **Kathmandu University Medical Journal, 4**(2), 258–263.

Simkhada, B., Porter, M. A., & van Teijlingen, E. R. (2010). The role of mothers-in-law in antenatal care decision-making in Nepal: a qualitative study. **BMC Pregnancy and Childbirth**, **10**, 34.

Simkhada, B., Teijlingen, E. R. V., Porter, M., & Simkhada, P. (2008). Factors affecting the utilization of antenatal care in developing countries: systematic review of the literature. **Journal of Advanced Nursing, 61**(3), 244-260.

Tripathi, V., & Singh, R. (2015). Ecological and socio-demographic differences in maternal care services in Nepal. **PeerJ, 3**, e1215.

Tucker, J. S., Hall, M. H., Howie, P. W., Reid, M. E., Barbour, R. S., Florey, C. D., et al. (1996). Should obstetricians see women with normal pregnancies? A multicentre randomised controlled trial of routine antenatal care by general practitioners and midwives compared with shared care led by obstetricians. **BMJ, 312**(7030), 554–559.

Van den Broek, N. R., & Falconer, A. D. (2011). Maternal mortality and Millennium Development Goal 5. **British Medical Bulletin, 99**(1), 25-38.

Van Teijlingen, E.R., Hundley, V., Rennie, A.M., Graham, W., & Fitzmaurice, A. (2003). Maternity satisfaction studies and their limitations: what is, must still be best. **Birth, 30**, 75–82.

World Health Organization [WHO]. (2007). **Maternal Mortalityin 2005: Estimates developed by WHO, UNICEF, UNFPA and the World Bank.** Geneva: The Organization.

World Health Organization [WHO]. (2013). **Trends in maternal mortality 1990 to 2013: Estimates by WHO, UNICEF, UNFPA, the World Bank.** Geneva: The Organization.

World Health Organization [WHO]. (2015). **Saving mothers lives.** From http://www.who.int/reproductivehealth/ publications/monitoring/ Full-infographic.pdf?ua=1

Table 1 Measures: scores range and reliability

Measure (source)	No. of items	Scores range	Reliability
Demographics	10	-	-
Predisposing factors			
Knowledge	9	1 (true), 0 (false and do not know)	Kuder-
Perception	9	1 (Strong agree) to 5 (Strong	Richardson(.83)
Enabling factors (accessibility to antenatal		disagree)	Cronbach's alpha
care services, time of first visit, services		1 (Certainly yes) to 0 (Certainly no)	(.90)
availability, environmental condition, quality of			-
ANC services, satisfaction of ANC services)			
Reinforcing factors (Source of information&	21	1 (Certainly yes) to 0 (Certainly no)	-
Support from husband/ family)			

Table 2 Frequency and percentage of respondents by socio-demographic characteristics

Socio-demographic characteristics	Frequency	Percentage	Socio-demographic characteristics	Frequency	Percentage
Age Group			**Religion**		
- 18 to 20	46	12.6	- Hindu	302	83.0
- 21 to 35	291	79.9	- Buddha	35	9.6
- 36 to 43	27	7.4	- Muslim	22	6.O
			- Christian	5	1.4
Mean=26.9, S.D.=5.6, Min=18, Max=43					
Education of pregnant women			**Husband's Education**		
- No schooling	44	12.1	- No schooling	6	1.6
- Primary school	181	49.7	- Primary school	49	13.5
- Secondary school	87	23.9	- Secondary school	145	39.8
- High school	37	10.2	- High school	131	36.0
- University	11	3.0	- University	30	8.2
- Vocational training	4	1.1	- Vocational training	3	0.9
Occupation of mothers			**Husband's Occupation**		
- Government	13	3.6	- Government	16	4.4
- Private	40	11.0	- Private	74	20.3
- Housewife	291	79.9	- labour	61	16.8
- Agriculture	20	5.5	- Agriculture	213	58.5
Monthly income			**Caste**		
- Rs.500 to Rs.10,000	245	67.3	- Brahmin	30	8.2
- Rs.11,000 to Rs20,000	88	24.2	- Chhetri	173	47.6
- Rs.21,000 to Rs.30,000	27	7.4	- Dalit	52	14.3
- Rs.31,000 to Rs.35,000	4	1.1	- Janajati	95	26.1
			- Other (Kumal)	14	3.8
Mean=9,549, S.D.=6,570, Min=500, Max=35,000					

Table 3 Percent distribution of ANC Service Utilization by women's characteristics and other

Characteristics	<4 times		≥4 times		No ANC		Total		Characteristics	<4 times		≥4 times		No ANC		Total	
	N	%	N	%	N	%	N	%		N	%	N	%	N	%	N	%
Age Group									**Distance**								
18 to 20	15	10.6	28	13.8	3	15.0	46	12.6	≤2 km	78	55.3	104	51.2	6	30.0	188	51.6
21 to 35	113	80.1	163	80.3	15	75.0	291	79.9	2 to 5 km	32	22.7	70	34.5	2	10.0	104	28.6
36 to 43	13	9.2	12	5.9	2	10.0	27	7.4	>5 km	31	22.0	29	14.3	12	60.0	72	19.8
Education of									**Environment**								
pregnant women	85	60.3	127	62.6	13	65.0	225	61.8	**ANC clinic**								
Illiterate	56	39.7	76	37.4	7	35.0	139	39.2	Good	91	64.5	142	70.0	14	70.0	247	67.9
Literate									Not good	50	35.5	61	30.0	6	30.0	117	32.1
Husband									**ANC services**								
Education									**available**								
Illiterate	19	13.5	33	16.3	3	15.0	55	15.1	Yes	102	72.3	149	73.4	14	70.0	265	72.8
Literate	122	86.5	170	83.7	17	85.0	309	84.9	No	39	27.7	54	26.6	6	30.0	99	27.2

Table 3 Percent distribution of ANC Service Utilization by women's characteristics and other (cont.)

Characteristics	<4 times		≥4 times		No ANC		Total	
	N	%	N	%	N	%	N	%
Occupation of pregnant women								
other	26	18.4	26	12.8	1	5.0	53	14.6
Housewife/ Agriculture	115	81.6	177	87.2	19	95.0	311	85.4
Occupation of husbands								
other	35	24.8	96	17.7	5	25.0	136	37.4
Agriculture	106	75.2	107	82.3	15	75.0	228	62.6
Monthly income								
≤9,549	87	61.7	117	57.6	15	75.0	219	60.2
> 9,549	54	38.3	86	42.4	5	25.0	145	39.8
Caste								
Brahmin/ Chhetri	90	63.8	108	53.2	5	25.0	203	55.8
Dalit/Janajati/ Other	51	36.3	95	46.8	15	75.0	161	44.2
Religion								
Hindu	125	88.7	171	84.2	6	30.0	302	83.0
other	16	11.3	32	15.8	14	70.0	62	17.0
Information from FCHV								
Yes	104	73.8	164	80.8	8	40.0	276	75.8
No	37	26.2	39	19.2	12	60.0	88	24.2
Knowledge about antenatal care service utilization	125	88.7	179	88.2	17	85.0	321	88.2
Good	16	11.3	24	11.8	3	15.0	43	11.8
Poor								
Mean=7.5, S.D.=0.9, Minimum=4, Maximum=9								
Perception about antenatal care service utilization	105	74.5	129	63.5	3	15.0	237	65.1
	36	25.5	74	36.5	17	85.0	127	34.9
Positive								
Negative								
Mean=20, S.D.=2.38, Minimum=13, Maximum=26								

Characteristics	<4 times		≥4 times		No ANC		Total	
	N	%	N	%	N	%	N	%
Waiting time to see health workers								
<30 minutes	132	93.6	167	82.3	2	10.0	301	82.7
≥30 minutes	9	6.4	36	17.7	18	90.0	63	17.3
Time spent (including travel time)								
≤2 hour	89	63.1	123	60.6	10	50.0	222	61.0
>2 hour	52	36.9	80	39.4	10	50.0	142	39.0
Quality of ANC services								
Good	46	32.6	45	22.2	5	25.0	96	26.4
Poor	95	67.4	158	77.8	15	75.0	268	73.6
Satisfaction of ANC services								
Yes	78	55.3	144	70.9	6	30.0	238	65.4
No	63	44.7	59	29.1	14	70.0	126	34.6
Complications								
No	85	60.3	150	73.9	14	70.0	253	69.5
Yes	56	39.7	53	26.1	6	30.0	111	30.5
Information from TV								
Yes	76	53.9	129	63.5	6	30.0	211	57.9
No	65	46.1	74	36.5	14	70.0	153	42.1
Travel costs from home to health Service								
No travel costs	28	19.9	11	5.4	4	20.0	43	11.8
Rs.1 to 50	78	55.3	161	79.3	6	30.0	245	67.3
> Rs.50	35	24.8	31	15.3	10	50.0	76	20.9
Mean=30, S.D.=2.33, Minimum=0, Maximum=100								
family support								
Poor	19	13.5	21	10.3	11	55.0	51	14.0
Moderate	52	36.9	73	36.0	7	35.0	132	36.3
Good	70	49.6	109	53.7	2	10.0	181	49.7
Mean=11.77, S.D.=1.77, Minimum=8, Maximum=16								

Table 4 Univariate and Multivariate analyses of barrier of antenatal care utilization

Independent Variables	ANC Utilization		Crude	95% CI	Adjusted	95% CI
	YES	NO	OR		OR	
	N (%)	N (%)				
Religion						
Hindu	296 (86.0)	6 (30.0)	1		1	
Other	48 (14.0)	14 (70.0)	**14.39***	5.27–39.26	**12.10***	3.71–39.52
Caste						
Brahmins &Chhetris	198 (57.6)	5 (25.0)	1		1	
Other	146 (42.4)	15 (75.0)	**3.86***	1.27–11.79	2.06	.51–8.29
Family support						
Poor	40 (11.6)	11 (55.0)	**3.84***	1.22–12.03	**4.15***	1.04–16.56
Moderate	125 (36.3)	7 (35.0)	1.43	.49–4.18	1.750	.51–6.03
Good	179 (52.0)	2 (10.0)	1		1	
Information from TV						
Yes	103 (29.9)	6 (30.0)	1		1	
No	241 (70.1)	14 (70.0)	**2.86***	1.15–7.11	**3.77***	1.29–11.03
Information from FCHV						
Yes	268 (73.6)	8 (40.0)	1		1	
No	96 (26.4)	12(60.0)	**5.08***	1.61–2.78	1.07	.16–1.87
Quality of ANC service						
Good	275 (79.9)	5 (25.0)	1		1	
Not good	69 (20.1)	15 (75.0)	**5.25***	1.09–12.73	**4.56***	2.34–19.54
Distance to Health institution for ANC services						
≤ 2 km	284(82.6)	6 (30.0)	1		1	
>2 km	60 (17.4)	14 (70.0)	3.46*	2.10–5.31	1.73	.96–2.61
Travel costs from home to health institution						
No travel costs	207 (60.2)	4 (20.0)	1		1	
Rs.1 to 50	124 (36.0)	6 (30.0)	.541	.16–1.61	.392	.10–1.52
> Rs.50	13 (3.8)	10 (50.0)	**3.68***	1.93–14.53	**14.55***	2.22–95.28
Waiting time to see health workers	299 (86.9)	2 (10.0)	1		1	
<30 minutes	45 (13.1)	18 (90.0)	**6.32***	2.65–6.45	2.09	.65–5.43
≥30 minutes						
Satisfaction of ANC services						
Yes	222 (64.5)	6 (30.0)	1		1	
No	122 (35.5)	14 (70.0)	**2.49***	1.03–3.69	**3.89***	1.60–6.92
Complications						
No	235 (68.3)	18 (90.0)	**3.92***	2.08–4.32	1.97	.87–2.31
Yes	109 (31.7)	2 (10.0)	1		1	
Perception about antenatal care service utilization						
Positive	234 (68.0)	3 (15.0)	1		1	
Negative	110 (32.0)	17 (85.0)	**3.68***	1.93–14.53	**4.26***	1.08–17.89

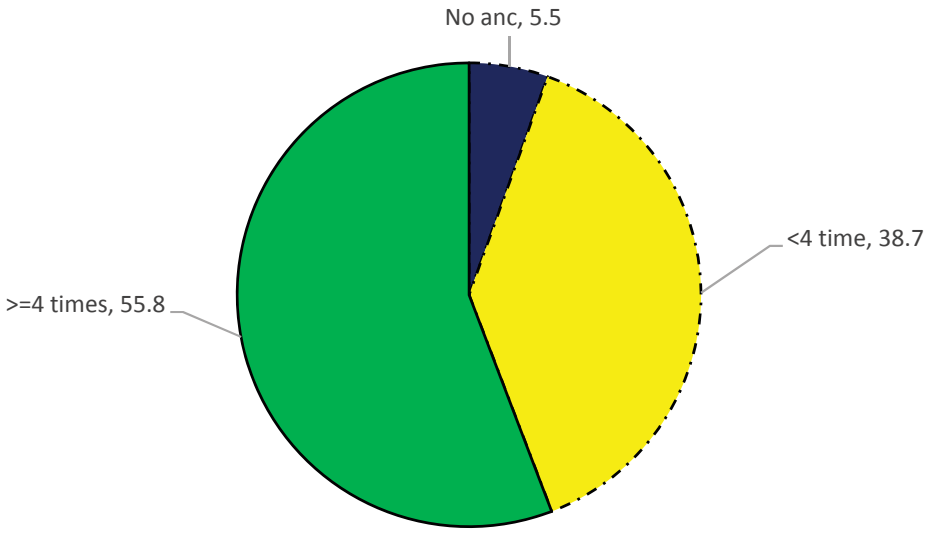

Figure 1 ANC Service Utilization