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Socio-demographic factors affecting utilization of Antenatal Care Services in Botswana

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Abstract

This study was based on secondary data from BOTSWANA FAMILY HEALTH SURVEY of 2007 (BFHS, 2007). This research draws its findings from a population of women aged between 15 and 49, who have ever been pregnant and have had a child prior to the survey. Basically, the study focused on women who have ever been pregnant and /or those who have ever had a live birth. The results, show that education, place of residence and marital status of the respondent were strongly associated with use or none use of antenatal care. Use of antenatal care services is not only associated with many attendances to antenatal care services, socio-economic factors but also associated with the way antenatal care is implemented. The findings of this study provide insights to inform planners and policy makers to draft and implement policies that would be appropriate throughout the country in the delivery of reproductive health services that would be appropriate to both the mother and child. These findings indicate that there are differentials in the use of antenatal care services. The paper is based on a Master's thesis that used secondary data from BOTSWANA FAMILY HEALTH SURVEY of 2007 (BFHS, 2007).

Keywords: Factors, utilization, Antenatal care services

Introduction

Antenatal care program has been shown by various writers to improve maternal health, thereby reducing maternal and infant morbidity and mortality, (Nginya, 1980). It is generally recommended that antenatal care visits be made monthly for the first 7 months, fortnightly in the 8th month, and then weekly until birth, (Magadi, Madise and Rodrigues, 2000). The practice is that, the first visit is made during the third month of pregnancy. Using this starting period, women would have about twelve to thirteen antenatal visits during a pregnancy, (WHO, 1988). There are many conditions that are monitored during antenatal care service provision including checking blood pressure, and the baby's heartbeat. However, in many developing countries, women do not attend antenatal clinics regularly.

National governments and international community are interested in addressing the challenges of low antenatal attendance as portrayed by numerous national and international

conferences addressing issues on antenatal care (WHO & UNICEF, 2003). The Government of Botswana joined the rest of the world in signing the Plan of Action in line with guide lines in ICPD. The plan of Action signalled a major paradigm shift from a demographically driven focus on family planning to a health driven focus on sexual and reproductive health (Stephen, 2001). Through the reproductive health programme women are being empowered to consider their abilities to control their health issues, rights, needs and channelling them into the process development have been at the forefront of many such meetings and conferences, such as the UN Decade for women (1976-1985), World Women conference of Beijing in 2005 and beyond, (WHO & UNICEF, 2003).

In Botswana, primary health care operates within the framework of several programs that include antenatal care, PMH program, MCH program and SRH program. Within the primary health care programme, all pregnant mothers are expected to attend antenatal care regularly. The sexual and reproductive health approach is comprehensive, integrated and addresses the essential needs of individuals throughout their reproductive life cycle, (Kasabiiti and Asiimwe, 2007). In the post ICPD, the Government of Botswana reaffirmed its commitment by enacting responsive policies such as the Botswana National Health Policy which was approved by the government in 1995 (UNFPA, 2004). The objectives of the health policy were based on the principles of primary health care as contained in the Alma-Ata Declaration of 1978. Health objectives were set and special attention was focused on high-risk groups, such as children, adolescents, elderly, disabled persons and pregnant women (Botswana National Health Policy 1998). The impact of HIV/AIDS and the National STI/HIV/AIDS Policy (1998) was adopted. Among the objectives of the National STI/HIV/AIDS policy was to prevent transmission of human immunodeficiency virus from mother to child during delivery (Botswana National Health Policy, 1998).

The Botswana National Health Policy (1998), which has been revised, advocated for pregnant women to be tested for HIV/AIDS as they visit antenatal care clinic and appropriate action to be taken regarding prevention from mother to child. The aims of Botswana National Health Policy are to reduce maternal and perinatal morbidity and mortality. Consequently, many statutory instruments were developed by the Botswana government to acknowledge the importance of reducing maternal and perinatal morbidity and mortality. There-by making antenatal care provision key to reducing perinatal morbidity and mortality. It is in the forgoing that this study investigates factors influencing utilisation of antenatal care services in Botswana.

The Problem

Use of antenatal care services are not effectively used. This is because there are cases regarding complications during delivery and deaths related to pregnancy in some developing countries. Countries like Zimbabwe the situation might be bad as antenatal care services may not be effectively provided because the poor may not be able to buy whatever is prescribed to them. They are variables that impact the utilisation of antenatal care. The study explores the use of antenatal service in Botswana and the researcher used a secondary source of data which was gathered during the 2007 Botswana Family Health Survey. The 2007 Botswana Family Health Survey IV showed that the use of antenatal care for the most recent birth in the five years preceding the survey was 26.7%. Moreover, there was significant variation of use of antenatal care service by the Kenyans (Owino, 2009). In another report, women from Addis Ababa tended to exhibit the highest use of antenatal care 85 percent, whereby women from urban (63.4) percent while from rural areas it was (21.6) percent (UNFPA,2004). Similarly, a

study conducted in southern Ethiopia in 2003 showed that the proportion of women who received antenatal care for their most recent birth in the six years preceding the survey was 26.1 percent. Women living in rural areas were less likely to receive antenatal care than those women in urban areas (Young, McMahon and Bowman, 1990). In this regard, good examples are maternal age, education and parity, which have been examined as determinants of health care use repeatedly (Ekeroma, 1999 and UNFPA, 2004). Another important factor in utilization of maternity care services, especially in Africa, is the cultural background of the woman. With this information, the question then became "how is the situation in Botswana about antenatal care service utilisation?" It is reported that a large proportion of pregnant women in Botswana seek antenatal care from health facilities. 95% of births occurring during the five years preceding the Botswana Family Health Survey 2007 went for antenatal care (Botswana CSO, 2009). In rural areas, a small proportion of women gave birth at home without having gone for antenatal care (Bour, 2004).

Objectives of the study are to:

- find out the distribution of women 15-49 years by selected socio-demographic characteristics
- find out the stage at which mothers first attend antenatal care by socio-demographic factors
- find the relationship between the stage at which mothers first attend antenatal care by socio-demographic factors
- find out the health personnel consulted at antenatal care visit by socio-economic demographic factors
- find out the number of antenatal care visit by socio-demographic factors
- Identify the socio-demographic factors that influence the up-take of antenatal care services in Botswana.

Significance of The Study

The study is consistent with the goals of International Conference on Population and Development (ICPD 10), the World Health Organization (WHO), and United Nation Children's Funds (UNICEF), Conference on Women and the MDG Goal 5, which is on improving maternal health care. Millennium Development Goals (MDG 5) has two sub targets and the targets are to reduce by three quarters, between 1990 and 2015, the maternal mortality ratio and to achieve, by 2015, universal access to reproductive health (United Nations Millennium Development Goals website, 2006). Secondly, the study provides a systematic body of knowledge that can be explored for appropriate policy formulation and enables the responsible authorities to come up with initiatives that encourage the utilization of antenatal care services in Botswana. Finally, it is breaking ground for new knowledge in the discipline and useful for programs that target relevant risk groups among them being the pregnant women. The need to conduct the study was to establish factors that hinders women from attending to antenatal care so that ways to address that can be put in place. Maternal health is critical in our societies and knowing what hinders progress would help in addressing the issues that affect communities in depth.

Related Literature Review

The purpose of this section is to show what other researchers have done and written about antenatal care utilisation, in Botswana. In a study by Letamo and Rakgoasi (2003) which

used secondary data from the Botswana Family Health Survey of 1996. The study focused at factors associated with non-use of maternal health services in Botswana. The independent variables used in the study were age, parity, education, marital status, socio-economic status as well as the place of residence. This research is different from that which was conducted by Letamo and Rakgoasi (2003) focused on factors that influence non utilisation of antenatal care services in Botswana.

Another study that was conducted in Botswana was on the role of men in antenatal care and prevention of mother to child transmission program in Botswana (Nair and Rakgoasi, 2005). The focus of this study was on the levels of knowledge, attitudes and perceptions of men and women towards the utilisation of antenatal care services, Voluntary and counselling testing services (VCT) for HIV and prevention strategies of HIV/AIDS especially PMTCT. Age and place of residence were captured as independent variables. The study recommended that the government was supposed to stipulate that ANC attendance should include both the female and the male partner. This was meant to foster awareness and the importance of ANC on both parties. Involving men on antenatal care issues is a factor that influences utilisation of antenatal care. The other recommendation (Nair and Rakgoasi, 2005) was on the perception that ANC services for pregnant women was massaging of the abdomen by nurses or doctors. It was suggested that there should be a strong (Individual education and counselling) IEC component targeting males on the details of ANC services. The deficiencies that will be addressed by this study are that it will investigate the factors that influence the utilisation of antenatal care services in Botswana.

Socio- demographic Factors influencing antenatal care utilization are discussed below
Education and antenatal care utilisation

Education helps men and women claim their rights and realize their potential in the economic, political, health and social arenas. Education increases female autonomy, decision-making power within the household, and builds greater confidence and capability to make decisions regarding their own health (Matsumura & Gubhaju, 2001 and WHO & UNICEF, 2003). According to Sharma (2004), empowered women can stand for their rights and they can even make sound decisions about their health.

In addition, WHO & UNICEF (2003), emphasised that education and emancipation in its broadest sense can change anything including the full participation of women in their health. It is also the single most powerful way to uplift people out of poverty and ill-health (Alam; Qureshi; Adil & Ali, 2005). Education plays an important role and gives a foundation for mother's development towards healthy living. Education is an intrinsic part of any strategy that can be used to address the health challenges that are prevalent in many societies, such as maternal mortality. Education is the gateway to women's empowerment (Sharma, 2004). Education is one of the social sectors that have received continues government attention in Botswana since the country attained independence in 1966. This sector has always had the largest share of government budget (DailyNews Wednesday February 6, 2013, No. 23 page 4). A study conducted by Navaneetham and Dharmalingam (2002), revealed that women's education level and living standards were found to be an important factor in seeking antenatal care in Karnataka but not in Andhra Pradesh in India. The study found that, women with high school education and above were more likely to use antenatal care services when compared to illiterate women in Karnataka (Navaneetham and Dharmalingam, 2002). It was realised that women whose husbands had at least high school education were more likely to use antenatal care services compared to women whose husbands had no education at all.

In comparison to those without any formal education, women with secondary education, were 2.2 times more likely to utilise antenatal care services and established a significant relationship between two of the variables, (p=0.011), **(**Kasabiiti and Asiimwe, 2007). Education has been found in several studies that it positively influenced antenatal care utilization, (Owino 2009; and Navaneetham & Dharmalingam, 2002). It was also observed that other factors like the provision of free antenatal care can also contribute towards utilisation of antenatal care services. In Zaria and Nigeria, Jimoh (2003), found that more women who had formal education attended antenatal care clinic earlier and were more likely to follow instructions given by the attending health officer than mothers with low education. It was also indicated that, the higher the formal education a woman had the less likely she was to book late in pregnancy, (Kroeger, 1993). Educated women are more likely to realize the benefits of using antenatal care services, (Matsumura and Gubhaju, 2001).

In contrast to illiterate women, educated women bear fewer children and achieve better child survival, because they avoid early marriage, teenage pregnancy, and high parity and this is because they attend antenatal services more frequent. It was noted by some scholars that attendance to antenatal care is an important activity in the prevention of maternal deaths**, (**Lee. & Grubbs, 1995; Misra & Guyer, 1998 and Akukwe, 2000). Education on antenatal care issues should be provided at an early stage to teenagers so that they may put value to the program rather than to wait for them to become pregnant. Antenatal awareness programs can be put in place at village level were teenagers can be sensitized on issues related to antenatal care services. This early education will enable adolescents to acquire the necessary knowledge to make informed decisions about issues regarding antenatal care services, (Ehlers, Maja, Sellers & Gololo, 2000).

Psycho-social Factors

There are two major types of pregnancies, namely planned (intended) and the unplanned (unintended) pregnancy. Intended pregnancy occurs when the mother is consciously motivated to fall pregnant. The unintended pregnancy usually occurs due to many factors, for example the family planning method may fail resulting in pregnancy. It may also result from rape and at times the myths that mothers believe in can be a contributing factor to unplanned pregnancy, for example in some communities, mothers believe that by washing the body immediately after having sexual intercourse one would not fall pregnant, which according scientific knowledge that may not be correct. As a result, these mothers may fail to recognise that they are pregnant and therefore seek antenatal care services late, (Nichols & Zwelling, 1997 and O'Callaghan, Bororkowski, Whitman, Maxwell & Keogh, 1999). It was captured in literature that at times women may fail to notice that they are pregnant as a result they may fail to seek early antenatal care services.

The use of antenatal care services can also be limited by the woman's attitude towards her pregnancy and other psychological factors. This is because there are different situations that can lead to pregnancy. For the cases of unplanned pregnancies, some occur accidentally, especially with teenagers still at school and such a pregnancy can be concealed leading to none attendance to an antenatal care clinic. This is because attending antenatal clinic would expose the teenager to the community and the parents, the teenager would rather not attend antenatal clinic. The other situation is when pregnancy was a result of rape. The psychological aspects relating to what happened will make the pregnant women to fail to accept what has happened. It would lead to self-denial to the reality, leading to nonattendance to antenatal care services, (Ehlers, Maja, Sellers & Gololo, 2000).

Age and Antenatal Attendance

Age and culture may be seen to go hand in hand because older women have their own understanding of life and the traditional beliefs they subscribe to have both positive and negative impact to antenatal attendance. The antenatal care services may not be youth friendly and the approach by health professionals to the teenagers may be discouraging. Most of antenatal care service providers in Lesotho offered antenatal services without regard to the age of the pregnant mother which is also a case in Botswana, (Aya, 2002). This scares some teenagers and would make them feel out of place while the older women who might have had several deliveries without experiencing any challenges may not see the need to attend antenatal clinic. The other group of older women can be those who might have experienced challenges in their previous deliveries and this group is motivated to use antenatal care services. Providing antenatal care to all mothers of varying age groups might be good for the health care professionals, but it might be a drawback to the pregnant teenage mother who may find themselves in the company of older women who are most probably married, while they are not. It is important for antenatal care programs, to be done with the input from pregnant mothers, and that the services are made to be user friendly and interesting as possible to them, otherwise the pregnant women may not view the services as valuable to them, particularly the teenage mothers, (Anderson; Hogberg and Bergstrong, 2000).

Socio-Economic Status related Factors

Social support has been reported to affect attitudes and behaviours, including satisfaction with pregnancy and parenting, (O'Callaghan, et al, 1999). Pregnant adolescents who have high stress and low social support networks have been found to have more neonatal and obstetric problems than those who have high stress and high social support networks, (O'Callaghan, et al, (1999); and Ransom & Yinger (2002)). Attending antenatal care clinics early will be an aid in the identification of such stress and depression, resulting in appropriate management of the identified problems. Several authors indicated financial challenges as the major constraint to antenatal care attendance, (O'Callaghan et al, (1999); Mirowsky & Ross (2002), Akukwe (2000)). While having a medical aid or a health care insurance policy is key to attending antenatal care in the USA and other Western countries, but this is not the case in Lesotho and in some countries in Sub-Saharan Countries, because women are not required to have any insurance to receive antenatal care services. In fact, antenatal care services as well as use of contraceptive services are among the cheapest health services offered to mothers, **(**CIA: The World Fact book, 2002). For instance, in Lesotho they pay M10.00 which is equivalent to $1.22, is required for the first antenatal visit; subsequent visits are free of charge so that the pregnant mothers would attend these services more often. Inadequate antenatal care services have been associated with low income and ethnicity in several studies, (CIA: The World Fact book, (2002); Mirowsky & Ross (2002), *and* Akukwe (2000)).

While the issue of low income might be significant, ethnicity may not be found to be influencing factor in Lesotho, because 99.7% of the population are Basotho, only a small percentage (0.3%) comprise of other ethnic groups such as Europeans, Asians, Xhosas and Zulus. Antenatal care services are offered to all without regard to ethnicity, (CIA: The World Fact book, 2002). The percieved high cost of antenatal care services in some countries and poor antenatal care service delivery are among some major factores observed to hinder antenatal care attendance. Similar observation was made in Nigeria, by Awale, Linn, Then, Swe, Saiki, & Kadota (2006). But marital status did not significantly affect the antenatal care attendance in Nigeria.

Antenatal Care Service Providers' related Factors

Studies done by Dissevelt (1978) indicated that, some women pointed that the reasons which influenced their delay in or lack of antenatal clinic attendance were the long waiting hours at the service providers' office. Inconvenient service hours and at times they were not treated well by the service providers (Kasabiiti and Asiimwe, 2007). This may not be tolerated by pregnant teenagers, as they can be very impatient. The judgmental attitude displayed by some nurses towards pregnant mothers may negatively impact on pregnant women's efforts to attend antenatal care services (Nichols & Zwelling, 1997). Antenatal care services should be financially, functionally and geographically accessible, and should be women friendly and governed by confidential (Smart, 1996 and Lehana, 2000). Smart (1996), indicated that the environment in which services are provided for women, should be appealing to them, probably by avoiding the 'clinical' atmosphere often associated with hospital-based care **(**Lehana, 2000). Now, antenatal care services provided for pregnant mothers in Botswana and other developing countries are in hospitals, and are offered between 08:00 and 16:00 on weekdays only. This means, that they are not accessible in terms of time, and most countries operate in the same manner.

Distance Related Factors

Distance to an antenatal care service provider may be another deterrent to the pregnant mother. According to WHO, as cited by Dissevelt (1978) about five to ten kilometres to the health care facility is recommended. Some studies associated distance from service providers of antenatal care and perceived effectiveness of the service delivery system if distance is shortened (Cox, 2008). However, some studies, (Bandyopadhyay, 2003), noted that not all pregnant women may use the nearest antenatal care clinic. In that study, the distance was found to be not significant associated with low antenatal care attendance. A large proportion of (47%) pregnant mothers living within three kilometres from an antenatal care clinic did not attend antenatal care clinic (Bandyopadhyay, 2003).

Access and availability are key concerns in antenatal care utilization. Transportation to distant healthcare facilities may discourage women because of both the time taken and costs involved. Bour (2004), pointed that, distance to healthcare facilities is important even in developed countries, women living farther away from antenatal clinics are less likely to use antenatal care services. Elo (1992), and Magadi, Madise & Rodrigues (2000) held that, distance was significantly associated with antenatal care visit. An increase in distance or travel time to the nearest healthcare facilities was associated with fewer antenatal visits and lower uptake of antenatal care services, (Matsumura and Gubhaju, 2001). A qualitative study also showed that the distance to services or physical access were barriers to antenatal care utilization (Choudhry, 2003 and Sharma, 2004). Other qualitative studies found that uncomfortable transport, poor road conditions and difficulties in crossing big rivers were also barriers, (Matsumura & Gubhaju, 2001 and Mishra, 2004).

In another study conducted in Nigeria, (Jimoh, 2003), pregnant women had to travel more than 30 km to the hospital for antenatal care. This is clearly difficult, basing on the challenges encountered by pregnant mothers in getting transportation to and from the hospital. Many of these women face challenges even when they were going to Mongomo since the vehicle only went back to the village a day or two days after arrival, (Jimoh, 2003). Other studies have clearly shown that (Bandyopadhyay, 2003 and Cox, 2008), long distances affect the utilization of antenatal care and subsequently delivery in hospital. Many studies identified high cost of medication as a barrier to the poor people in developing countries**.** This

is probably due to high cost or inadequacy of the service provided. Perception of inadequate service can be a major barrier to antenatal use as well as the cost of the service. Providing free preventive and health promotive services to high risk groups such as children and pregnant mothers can be the way forward.

Access to Information

Several studies have analysed the relationship between antenatal care attendance and access to information. Lack of awareness about the importance of antenatal care and cultural barriers of ethnic groups may be among the factors inhibiting the utilisation of antenatal care in some countries. Antenatal care attendance was observed to be inadequate. Was the knowledge of the purpose of the service to pregnant mothers also inadequate? Similar observation was made in rural areas of India, (Choudhry, 2003) and in Malawi, (Kasenga, Bypass, Emmelin, Hurting, (2009)). In India and Malawi, the number of antenatal visits decreased after the second visit regardless of the level of education. A similar observation was made by, Kasenga, Bypass, Emmelin, & Hurting (2009), where only 17.5 % had attended more than twice. The majority had only attended twice (46.3%) while 36.3% only attended once. Pregnant mothers may find it difficult to travel in rural areas especially when the condition of the roads is poor and they happen not to have money, (WHO, 2006). Cost of accessing the antenatal care is an important determinant of whether to seek antenatal care or not, especially where distances to health care 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, 1988).

Women exposed to the mass media, especially television and radio, significantly use antenatal care services. Mothers with high levels of exposure were more likely to seek for antenatal care services, (Navaneetham and Dharmalingam, 2002). A study by Pallikadavath, Foss & Stones (2004) and Sharma (2004) found that watching television programs on health every week substantially increased the chances of women seeking antenatal care. The information on reproductive health motivates pregnant mothers to attend antenatal care. Some studies found that knowledge of family planning and antenatal care has a positive and statistical significant effect on antenatal use. Women with family planning knowledge were more likely to attend antenatal care clinics in Nepal (Sharma, 2004). Use of family planning was positively associated with antenatal care in India, (Pallikadavath, Foss & Stones, 2004). In addition, literature confirms that, contraceptive users attended early antenatal care survives in Jamaica (Magadi, et al, 2000 and Pallikadavath et al, 2004). (Nisar & White, 2003; and Alam, Qureshi, Adil & Ali, 2005) found that women's dietary knowledge was significantly associated with utilisation of antenatal care. Knowledge about danger signs in pregnancy was also found to be statistically significant in Pakistan, (Elo 1992 and Nisar & White, 2003).

Access and Availability of Antenatal Care Services by Residence

Navaneetham and Dharmalingam (2002), in their study captured that access and availability of health care services was expected to be higher in urban areas. It was found that there is higher use of antenatal care among women in urban areas than among women in rural areas was attributed to accessibility and availability of health in institutions in urban areas. However, in some countries a different situation was observed for example, 45 percent of women in Karnatake urban less likely received antenatal care than those in rural areas. In Andra Pradesh, there was no significant difference between rural and urban areas in the utilization of antenatal care, (Navaneetham and Dharmalingam, 2002). The contrast to the

findings in Karnataka was that in the south of India there was no significant differences between rural and urban women in antenatal care usage, (Govanndasamy and Ramesh, 1997). The pattern of relationship between access and availability of health care services and utilisation of antenatal care may not be uniform across regions while utilities remained the same.

It is important to note that many women in many developing countries believe antenatal care services have benefited them and have made useful suggestions to improve the level of antenatal attendance, **(**Kasabiiti and Asiimwe, 2007). Some of their suggestions were improved health education, health visits and community involvement were least suggested by the women, however such endeavour is likely to produce better results in terms of antenatal care attendance.

Women's autonomy is positively associated with antenatal care utilisation. Several Asian studies suggest that underutilisation of antenatal care is because of lack of women's autonomy. Social ties with others may influence a women's decision to seek antenatal care by exposing her to different ideas and by imparting information about the service providers (Bandyopadhyay, 2003). In some developing countries, men often control the cash in the household, making it difficult for women to pay for healthcare or transportation to clinics. In some societies women do not experience equality with men and often this will influence their access to healthcare (Holland and Hogg, 2001). The involvement of men on antenatal care programs can change the general perception that is wide in societies.

Religion of the Mother

It is unclear whether religion and ethnicity play an important role in antenatal care utilisation, as conditions varied and the instruments used to examine them differed. Studies show that Muslim women are less likely to use reproductive and sexual health services such as antenatal care because of lack of privacy, (Mishra, 2004) for example, exposure of legs and arms, is a taboo for Islamic and other women (Holland and Hog, 2001). However, they have high antenatal care use despite their cultural belief (Bandyopadhyay,2003 and Pallikadavath, et al, 2004). Women in some cultures do not use antenatal care because of the perception that the modern healthcare sector is intended for curative services only (Magadi et al, 2000). The cultural beliefs and myths about pregnancy have impacted on mother's use of antenatal care. It would be appropriate to explore how issues in Muslim and other cultures and beliefs may act as barriers to use of antenatal care.

Traditional beliefs and fear are strong in some communities, and may influence antenatal utilisation. In some cultures, male involvement has not been recognised as important in reproductive health. Men generally do not accompany their partners to antenatal care or attend the birth of their children (Mullick, Kunene & Wanjiru, 2005). This lack of involvement of men may influence antenatal care utilisation. Some studies indicated that religion's impact on utilisation of antenatal care was not uniform across regions. A case of India indicates that religion was not important at all in Kerala, Islamic women in Karnataka, Christians in Andhra Pradesh and Tamil Nadu as they were less likely to receive adequate antenatal care than their Hindu counterparts (Navaneetham and Darmalingam, 2002). Religious affiliation was not critical for receiving antenatal care services.

Secondary Sources of Data

The study tends to be objective and authentic since it relies on records, which may support to show aspect of a past reality. It sought to give out events the way they happened

in the past and the current trend, by referring to official documents. Chikoko & Mhloyi (1995) contend that information that one gets from the source about an organisation is what we call documentary evidence. Official documents can be taken as secondary data. To some extent use of documents can be taken as Historic Research method because past trends can be an authentic account of the past through scrutiny of verifiable data. By using official survey data, the research eludes some recent events as well as those that took place some years ago. Creswell (2003:157) mentions some advantages of using official collected documents as:

- They can be assessed at a time convenient to the researcher, that is, they are an unobtrusive source of information;
- They represent the data that are thoughtful in that the participants have given attention to compiling;
- As a written evidence documents save the researcher time and expense of transcribing.

It is the first-hand data, data free from distortions as such they contain the truth if professional ethics were adhered to in the collection of data as is the case with the Botswana Family Health Survey of 2007.

Creswell (2003:157) also mentions the following as disadvantages of using documents:

- It may be difficult for the researcher to understand the context that produced the material and the meaning of the material to those who used it. This calls for 'a good deal of laborious collaborative work' to find out how, or if, the text reveals the perspective of the author.
- Data has been viewed by many researchers as being subjective representing the biases of the promoters and when written for external consumption presenting an unrealistically glowing picture of how the organization functions (Bartone, 1991).

Withholding some documented data may make the researcher fail to have the desired information. The researcher relied on official data set because the chance for the Department of Botswana Statistics to keep distorted data is slim.

Sources of Data

The data used in the study was drawn from the Botswana Family Health Survey (BFHS-2007) carried out during September 2007-January 2008 by the Central Statistics Office in collaboration with UNICEF. Data were analysed using both descriptive and inferential statistics. The basic characteristics chosen for the study population are: maternal age, education, and mother's place of residence, mother's religion and mother's marital status. The survey was conducted throughout the whole country, and samples were drawn using multi-stage, self-weighted sampling procedure. Information from individual and household questionnaires was drawn for the analysis. To study the patterns and determinants of use of antenatal care services, the researcher has considered the most recent births, which took place during two years prior to the date of the survey. Pregnancy or births observed during the two years prior to the date of the survey have been used for analysis as many women may have correctly recalled all the events including the utilisation of antenatal care.

The study focused on the factors influencing the utilisation of maternal health care services during the last pregnancy or birth. The factors are:

Antenatal care visit: the information on antenatal care for all children born during the two years prior to the survey, whether antenatal care was obtained, who provided antenatal care, the timing of the first antenatal care visit, and the number of antenatal care visits. The number of antenatal care visits' is used to establish if a woman received antenatal care, and whether she had at least four visits or fewer than four visits. This is in accordance with the World Health Organisation's recommendation that a minimum of four antenatal visits is needed to accomplish the essential level of antenatal care. The variable was renamed as shown here: More than 4 visits was renamed as adequate antenatal care check-up while 1 to 4 visits was deemed in adequate antenatal care check-ups in this dissertation and the analysis has used such labels throughout.

The **'timing of antenatal care visits'** is used to establish if a woman received antenatal care, and whether the first visit was during the first trimester or later in the pregnancy. Anaemia is a serious and common challenge during pregnancy in most countries. The initiation of antenatal care in the first trimester facilitates the early diagnosis of anaemia, so that the condition can be corrected before delivery (WHO, 1996). The **Level of education** is used as an important determinant for utilisation of antenatal care services. Mothers were asked to indicate their level of education and even the level of education of their partners. The level of education is associated with the living standards which is also a factor in the utilisation of antenatal care services. In a study carried out by Navaneetham and Dharmalingam (2002), held that educated and working women are more likely than uneducated and non-working mothers to take advantage of modern antenatal care services. Educated women are also likely to have improved knowledge and information on modern medical treatment and have greater capacity to recognise specific illness (Navaneetham and Dharmalingam, 2002).

The Age and marital status of the respondent at the time of the survey was used as a control variable to capture the cohort effects on utilisation of antenatal care services in Botswana. This is because the younger and older women differ in their experience which affects, their health seeking behaviour as it is likely to vary between the younger and older pregnant women. Younger women are more likely to use antenatal care as they are likely to be exposed to modern medication as well as information and education than the older women (Elo, 1992 and Raghupathy, 1996). Birth order is strongly correlated with antenatal care utilisation. Mothers were found to give greater attention to their first pregnancy, as they are inexperienced with pregnancy and therefore more likely to seek antenatal care services. Women with higher parity are likely to give less attention to seeking antenatal care services (Elo, 1992 and Raghupathy, 1996). The later seem to have a perception that nothing wrong will occur.

Population of the Study

The target population for the study were females in age group 15 to 49 years. They were categorised in the following age groups; mothers aged 24 and below, those aged 25 to 35, and those aged 35 and above. Those women within the 15 to 49 age who have never been pregnant before and those who had not given live birth in two years prior to the survey were not involved in the study. Those females who fell below and above the stated age group were also not within the scope of the study even if they had had a pregnancy before.

Sampling Procedure

Data for the study was drawn from the Botswana Family Health Survey (BFHS, 2007). Information was collected on education, age, antenatal care services, and maternal status. The survey considered mothers of reproductive age, who had given birth to a two year or pregnant prior to the survey as eligible for interview. The selected mothers provided information on the duration of utilisation of antenatal care services at the time of interview. The maximum number of antenatal care visits they have made per pregnancy. The analysis of the data depended on the following and they were recorded as given below:

The questionnaire for the 2007 Botswana Family Health Survey WM3 individual Female (12-49 years) is divided into six sections. In the analysis of the data questions were selected from BFHS,2007:

Section 1, and these provided data on the respondent's background such as:

Question 102*: How old are you in completed years?* This question was used and the researcher restricted the study to the age levels 15 to 49 years. This group was selected as it is the most active age group in reproduction. The data was re-coded so to capture data for women aged from 15 to 49 years only.

Question 104*: What is the highest level of school you attended?* It was noted that the education levels were six on the questionnaire. In this analysis, the education levels were re-coded to three categories. Primary was recorded as primary and below, secondary and higher education were not re-coded. While the non-formal and nonstandard curriculum was re-coded to no schooling.

Question 111*: What is your current marital status?* Re-coding was done to come up with two categories, women ever in union and women never in union. This is because the experiences of married women were assumed to be like the experiences of women with their male partner at the time of the survey and the same applied to those who were ever in union. However, the differences being that married couple are legally staying together while the other is not but may be having similar experiences.

Section 3: Maternal and New Born Health module.

Question 304*: Whom did you see?* The categories on the questionnaire were seven. The seven categories were re-coded to three broad categories. Although other variables were straightforward to understand, the person seen for antenatal care variable needs further explanation. Who was seen for antenatal care is a composite variable created from many variables relating to Health professional (Doctor, Nurse and Auxiliary nurse) and ***Other*** person had the following sub-categories, traditional birth attendant, traditional doctor, relative/friend and other. Each of these variables was recorded into three variables (Doctor, Nurse and Other). This composite variability provided a better measure of who was seen for antenatal care.

Question 305*: At what stage of pregnancy did you start your antenatal care?* The responses showed the months and these were recoded to come up with trimester. The trimester is a period of three months therefore the numbers of months were divided by three. Those who reported for antenatal care later than the third trimester were compounded with those who attended during the third trimester. The categories used for the analysis of this questionnaire were: *First trimester (early antenatal care attendance)*, *Second trimester* and *Third and*

trimester (late antenatal care attendance). This was later recoded to a dichotomous variable for use in logistic regression *(early antenatal care attendance and late antenatal care attendance)*.

***Question 306**: How many times did you go for Antenatal care visits on this pregnancy?* The question was coded into two categories and the frequency run showed that there were some responses that did not show where they fell. These were removed as they would fit to fall into missing responses. The data analysed women who went for antenatal care services within the two-year period prior to the BFHS-IV 2007.

MESUREMENT OF VARIABLES.

The questionnaire used by the 2007 Botswana Family Health Survey had several variables that can be used to measure factors influencing antenatal care utilisation in Botswana. However, the study has been restricted to three dependent variables which are:

a) Whom did you see?
b) At what stage of pregnancy did you start your antenatal care?
c) How many times did you go for Antenatal care visits on this pregnancy

Five independent variables are used and these are: mothers' age, mothers' level of education, mothers' religious affiliation, mothers' marital status and mothers' place of residence. The variables are also captured by the conceptual model and were operationalised by aligning them with the modifying factors (age, education, religion, marital status and place of residence) while the perceived threats are aligned with possible risks during delivery, the intermediate risk for example, previous Caesarean section: high risk for example, hypertension or special risk for example diabetes. And the perceived benefits are the possible advantages of antenatal attendance which can be the mitigation of any possible pregnancy complications. These were likely to influence health seeking behaviour.

Independent Variables

Independent variables are those characteristics which are used as explanatory variables of mothers' age, mothers' level of education, mothers' marital status, mothers' place of residence and mothers' religious affiliation. The variables including age, and education level would make one employable; constitute what is referred to as socio-economic characters.

- Age refers to the completed age at the time of the Botswana Family Health Survey. It was measured as the number of completed years that is up to the last day before the survey, a woman had lived.
- Education refers to the highest level of formal schooling or training an individual has had. However, education as captured by the levels of education will also be considered as convenient. Education levels will measure never educated, primary and lower, secondary and higher education. The education is defined and captured as the mothers' education level.
- Marital status of the respondent. The idea is to analyse the utilisation of antenatal care services by marital status. It was recoded to two categories which are; ever in union and never in union. Initially the category consisted of six categories.
- The place of residence is the mothers' place of residence at the time of the survey. The place of residence is the socialisation milieu of the individual and as such will have some influence on mothers' use of antenatal care services. Specifically, mothers living in rural areas uphold to traditional, cultural norms and values tend to be strong and will be less informed about the values of antenatal care than their urban counterparts.

To distinguish between the possible effects of place of residence has been divided into urban and rural areas. This yielded a two-category variable.

- Religion refers to the women's religion. Religion is a variable that was put into three categories, thus Christianity, Badimo and other religions. Initially it had 11 variables and some were compounded as the numbers subscribed to them were insignificant when frequencies were run.

Dependent Variables

The dependent variables that were captured in BFHS-IV 2007 are also many but for this research only three will be used for analysis purposes. All the dependent variables (Who were seen for antenatal care, number of antenatal visits, and the stage at which antenatal care was taken by pregnant women) were binary, while the independent variables were either continuous or categorical. Some of the variables were straight forward to understand they were recorded.

Analysis of Data

In analysing the data, univariate tables were run to establish the frequencies of independent variables. Simple cross-tabulations were used for the preliminary analysis. Chi-square tests were also employed for examining the association of cross-classified variables. Logistic regression was finally used to deduce relationship between the influence of age, education, place of residence, marital status and religion. The model enables us to estimate directly the probability of utilisation of antenatal care by women who were part of the Botswana Family Health Survey of 2007. Let **P** be the probability of utilisation of antenatal care. Also, logistic regression model enables us to estimate the odds ratio of utilisation of antenatal care or not **(P/1-p).** This can be done using the following equation:

$$\mathbf{In\ (P/(1-P)} = Z=\beta_0 +\beta_1 X_1+ \beta_2 X\ \beta_{2\ldots}+ \beta_i X_i$$

$$P=\exp (\beta_i X / 1+\exp (\beta_i X)$$

The characteristics of using antenatal care services are identified as age, marital status, education, religion and place of residence. The objective of logistic regression was to find the best fit to describe the relationship between the dichotomous characteristics (dependent and independent variables).

The purpose of this section is to provide descriptive summary of the demographic and socio-economic profile of eligible respondents in the BFHS 2007 survey. All analyses of data in this study were done using the Statistical Package for Social Sciences (SPSS). The study uses the chi-square technique to test whether there is an association between uses of antenatal care services and the socio-economic, demographic and exposure to factors. Logistic regression analysis was used to estimate the likelihood of use of a specific form of antenatal care utilisation, given a set of socio-economic, demographic and exposure factors. Women aged 15-49 years were the target group.

The main background characteristics that were used in subsequent chapters' reproductive health is: age at the time of the survey, ever given birth to a live young one in two years prior to the survey and ever been pregnant. These are fundamental in the study because the first one is to capture data within the age group targeted; the other two are a prerequisite for a female to seek for antenatal care. In identifying those legible, three characters were questioned to any respondent so to establish legibility.

Use of antenatal services has been defined as the number of attendances to antenatal clinic during a pregnancy. It thus requires the units of analysis: be pregnant at the time of the survey or have had a pregnancy two years prior to the survey. The latter option has been chosen for this study due to the data availability. Hence the units of analysis of this study were mothers who reported to be pregnant or who had been pregnant two years before the survey. The other unit of analysis is the age range of 24 and below and 25 to 34 and those 35 and above. Those who were pregnant or had given birth two years before the survey and fell below the minimum age group or above the maximum age group were not part of this study.

Eligible respondent's Characteristics

Table 4.1 provides a descriptive summary of the demographic and socio-economic profile of respondents in the BFHS 2007. The analysis is restricted to the reproductive age groups of 15-24; 25-34 and to 35-49. The basic information of women in these reproductive age groups was important for the interpretation of the secondary data within the context of antenatal care attendance. The women who took part in this BFHS 2007, should have given birth two years prior to the survey. Those who happen to have given birth two years prior to the survey and who were aged below fifteen years were not part of this study; as a result, they were left out. The other category of those who were not part of the analysis was those who never became pregnant. The main background characteristics that were used in the analysis of use of antenatal care services are the age at the time of survey, place of residence, educational level, religious affiliation and marital status. For the ease of presentation, the socio-economic and demographic characteristics of the respondents for this study were grouped by dependent and independent variables. Each group of variables were tackled separately to establish how it impacts on the use of antenatal care services in Botswana.

Table 1.0 Percentage Distribution of mothers in BFHS 2007 by selected socio-demographic characteristics

	Number	Percent
Mother's age		
15-24	870	20.3
25-34	1783	41.7
35-49	1626	38.0
Total	**4279**	**100**
Mother's education		
Higher	574	13.5
Secondary	2290	53.5
Primary and lower	1106	25.8
Never attended school	309	7.2
Total	**4279**	**100**
Mother's marital status		
Ever in union	2552	59.6
Never in union	1728	40.4
Total	**4280**	**100**
Mother's place of residence		

Urban	2681	62.6
Rural	1599	37.4
Total	**4280**	**100**
Mother's religion		
Christian	3590	84.0
Badimo	99	2.3
Other	586	13.7
Total	**4275**	**100**

Source: BFHS (2007)

In this study five independent variables were considered: mother's age, mother's education, mother's religious affiliation, mother's place of residence during the survey and the mother's marital status.

Mother's age (years)

Most respondents in the study were in the middle ages (25-34year). This is a very important age category as it is usually a time when people have completed their career education, and a time when they are likely to be starting families. In particular, young age plays an important role in child bearing matters as it is most likely to respond well to challenges in childbearing. Lehana (2000), found that young age was likely to influence antenatal utilisation as it is the most fertile stage in the history of a woman. Childbearing is strongly associated with utilisation of antenatal care services as such it is expected that at middle age pregnant women should be visiting antenatal care clinic. The age range of the sample is from 15-24; 25-34 and 35-49 years. However, Table 4 .1 indicates, the age range of 25-34 years was over represented in the sample. The smallest group were those aged 15-24 years. The table also shows that a significant proportion 38.0 percent of the selected proportion of the sample were aged 35-49 at the time of the survey. This pattern is consistent with the age structure of Botswana population as they are more females considering the lower and upper age cut of point of the age groups.

It is probably one of the most important variables in conferring social status to women in many African societies. Table 4.1: A total of 62.0 percent of mothers were within the youth age group. However, it appears that young generation of the mothers used antenatal care services more than older generations; probably it is because they are at their highest stage of fertility. Indeed, three-out of five of those who used antenatal care were below 35 years. The percentage of mother using antenatal care services decreased as one approached 35-49-year age group. These age differentials have impact on decision-making indeed, since young generation might have been exposed to modern health trends, through education and other social amenities. On the contrary, older mothers remained tied to traditional and cultural values, which restricted delivery experiences from discussion especially about issues, deemed taboo according to the culture.

Mother's Education

Education is usually expected to empower women with life skills such that they can critically and objectively evaluate the course of action they take including the use of antenatal care services. Most of the respondents had attained secondary education (53.5%) followed by those who had primary and lower education (25.8%) and those who had higher education

(13.4%) and lastly those who never attended school (7.2%). Most of the sample had secondary and higher education aggregately. The distribution of mothers by education would show a normal distribution as most are in the middle with secondary education, while on the extreme left being those with primary and lower and on the extreme right being those with higher education. The category primary and lower can be explained in that primary education is a bit high compared with lower education. Examples of lower education may be the adult literacy classes whose main objective is to enable one with the ability to write one's name and probably sign at the bank and those who never attended school.

Mother's Marital Status

Childbearing issues are normally seen as mostly occurring in the marriage at least in the African context. Interestingly, the majority (59.6%) of the respondents were ever in union at the time of the survey, and this includes those who were cohabiting. Mothers who were never in union were 40.4 % of the population in the study.

Mother's Place of Residence

The place of residence at the time of the survey represented the area where the respondent lived during 2007. The frequencies show that 37.4 % of the pregnant mothers resided in rural areas, while 62.6 % resided in urban areas. The results are not consistent with the general rural-urban population distribution in Botswana where about 57 % of the population were residing in rural areas in 1993 (UNFPA, 2004). The trend has changed probably because of the development in urban areas that has acted as a pull factor, as women moved to urban areas in search of work and other opportunities.

Mother's Religion

Religiosity of respondents plays an important part in antenatal visits of individuals as different denominations usually have different teachings about antenatal care services. Such teachings may impact negatively on antenatal care visits. Table 4.1 shows that the majority (84.0%) of respondents were members of the Christian religion followed by those belonging to *other religious groups* (13.7%) and lastly Badimo (2.3%). The category Badimo was not aggregated with other religions as it was seen to be part of the traditional belief that was in place before foreign or modern religions were known in Botswana. The history of Badimo in the culture of Botswana is as old as the Botswana people. The analysis will show how different religious teachings impact on the utilisation of antenatal care.

The dependent variable used was the use of antenatal care and was measured by analysing sub-dependent variables; the *number of antenatal care visits* and the *timing of the first antenatal care visit*. The BFHS-IV used many variables that sought to reflect the utilisation of antenatal care and other issues on health but this study specifically looked at the utilisation of antenatal care services and that was with focus on the *number of antenatal care visits* and the *timing of the first antenatal care visit*.

Most of the mothers who took part in the survey indicated to have seen a health professional for antenatal care. The table shows that 6.0% reported to have seen a doctor for antenatal care while 91.8% reported to have been seen by nurses for antenatal care and only 2.2% saw other category (traditional birth attendant, traditional doctor, relative/friend and spiritual healer) for antenatal care. However, a large percentage (91.8%) reported that nurses were the most favourable by mothers for antenatal care. Utilization of antenatal care services is most effective if the clinic visits stated early in the pregnancy and continue regularly until

delivery. However, in most of the births in Botswana, antenatal care visits began late in the pregnancy. Table 4.2 shows that 8.5% of the mothers visited antenatal care services during the early stages of the pregnancy and 91.5 % of mothers began their antenatal care visits late in the pregnancy. This contrasted with recommendations by health personnel who recommend that mothers should be screened during the first trimester to avoid complications later in the pregnancy. Late in the pregnancy was interpreted as those who attended in the second and third trimesters as these are deemed to be late in the pregnancy. As a result, mothers who attended antenatal care late in the pregnancy may put themselves at a health risk as they may develop some complications during the gestation period.

An attempt was made to classify the quality of antenatal care mothers received during pregnancy. Based on the number of visits and the timing of antenatal visit, as a result, care was classified into two as adequate and inadequate antenatal care. Mothers who had 1-4 antenatal visits were considered to have got inadequate antenatal care and those mothers who had more than 4 visits were considered to have had adequate (81.9 %) antenatal care. It was observed that only 62.8 % of deliveries by mothers received inadequate antenatal care according to this classification. Above all, most of the mothers (81.9 %) who took part in the Botswana Family Health Survey 2007 received adequate antenatal care services. This was an important observation as more than half of the respondents benefited adequately from antenatal care services during their pregnancy.

Differentials in utilization of antenatal care

Simple cross-tabulations were used for examining the bivariate relationships between independent variables and the dependent variables.

Mother's age Group

Stage of antenatal care attendance

The results of the study show that mothers within the age range 15-24 (17.0 %) attended antenatal care early, followed by those aged 25-34 (25.7 %). In the age group 35-49, only 23.7 % of mothers attended antenatal care early. The age group 25-34 (25.7%) had a fair representation on early attendance for antenatal care. What the data reflects is that about less than half of the mothers attended antenatal care early in their pregnancy but that was across all age groups. It was observed that all the age groups attended antenatal care late in the pregnancy. Overall, the cross tabulations showed that a small proportion of mothers, who attended antenatal check-up early, is more than two fifths (83.0%) attended late in their pregnancy and that was drawn from the age group 15-24.

Person seen for Antenatal Care

The cross tabulation of the age and person seen for antenatal care showed that, a small proportion mothers saw a doctor for antenatal care, while the large proportion reported to have seen a nurse for the same service. Those aged 15-24 years (4.0 %) reported to have seen a doctor for antenatal care and the same age group had 93.5 % who reported to have seen the nurse. In the age group 25-34, 6.8% of mothers have seen a doctor and 91.2 % of mothers were seen by a nurse. In the age group 35-49, 8.1 % mothers reported to have been seen by a doctor and 89.8 % to have seen a nurse. The age group that made more appearances before a doctor for antenatal care was the mothers aged 35-49. The analysis also indicates that it is the same age groups (35-49) on which more than two thirds of mothers were seen by a nurse for antenatal care.

Number of Antenatal care Visits

The study found that the use of antenatal care was high (78.0%) among mothers in the age (25-34) years and it was this age group which showed that two thirds of the mothers received adequate antenatal attendances. Relatively lower proportion of mothers (76.3 %) received antenatal care in the age group 15-24 years. This could be explained by the assumption that at age 15-24 of the mothers are teenagers who may still be at school and may tend to hide the pregnancy by not seeking antenatal service.

Mother's Religion

Stage of antenatal care attendance

The results show that 22.9% of mothers who attended antenatal care services at the early stage of the pregnancy were from Badimo religion, this was followed by mothers from Christian religions (22.7%). The lowest during that stage were those mothers who belonged to other religion (19.3%). The results also showed that (80.7%) of mothers attended antenatal checkup late. A large percentage of 80.7 % of mothers who belonged to other religions attended antenatal care late in the pregnancy. During the late stage of the pregnancy, 77.3 % where Christians, 77.1% were those women who belonged to Badimo (African tradition religion) while those who belonged to other religions (Islam, Bahai, Hinduism, Buddhism etc) were 80.7 %. The major concern was the low attendance at the early stage of pregnancy by the women who belonged to all religions as it is the most important stage of monitoring the development of the pregnancy. Some religion groups discourage their followers from using antenatal care services; as a result, their followers may end up attending antenatal care late or none.

Person Seen for Antenatal Care

It was observed that 6.2% of Christian women were seen by a medical doctor while 5.0% of women from other religious groups were seen by a medical doctor for antenatal care and 5.6% who were ascribed to the Badimo visited a doctor for antenatal care. Those women who were attended to by a doctor were a small proportion and the data show that most of the respondents were seen by a nurse for antenatal services.

Number of Antenatal Care Visits

The adequacy of antenatal care visits is concerning. Christian women received adequate antenatal care checkup. While of women in the religion category **others** and 62.9% of Badimo religion reported to have received antenatal checkup. **Other** religions reflected that 74.3% to have received adequate antenatal care checkup when compared to women who are Christians. The final category of analysis showed that 62.9% received adequate antenatal care and that is a very insignificant.

Mother's Marital Status

Stage of antenatal care attendance

The results show that the utilization of antenatal care services increased with marriage implying that issues on maternal health are high (24.2%) among the ever in union women during the early stages of pregnancy when compared with women never in union (18.9%). It was observed that attending to antenatal care late in the pregnancy shows that ever in union women were higher in percentage (81.1%) than mothers never in union. The crucial stage of

attending antenatal care visits is early in pregnancy as it is the stage where complications can be identified and appropriate action taken.

Person seen for antenatal care

Less than three quarters of women (7.6%) ever in union were seen by a doctor for antenatal care, while the proportion among women never in union was only 3.5%. The figure of those who were seen by a nurse was high (93.7%), for women never in union and 90.6 % for women ever in union. The possible explanation to this could be that most clinics in Botswana are managed by nurses and the doctor would be rotating the clinics in each region. As a result, not all pregnant women may have a chance to be seen by a doctor for antenatal care. The percentages of women who reported to have been seen by other persons were low for ever married mothers (1.9%) and never married mothers (2.8%).

Adequacy of antenatal care visits

The analysis of data indicates that 76.2 % of ever married mothers received adequate antenatal care checkups. 78.6% of women who never married reported to have received adequate antenatal care checkups. In this study, attendance to antenatal care for 1 to 4 times was taken to be inadequate attendance. One fourth (23.8 %) of ever married women and 21.4% of women made inadequacies to antenatal care.

Table1.1 Percentage of pregnant mothers attending to antenatal care services by selected socio-demographic characteristics.

Characteristics	**Stage of ANC attendance**		**Number of ANC attendance**		**Person seen for ANC**		
	Early	Late	Inadequate attendance	Adequate attendance	Doctor	Nurse	Other
Mother's Age							
	17.0	83.0	23.7	76.3	4.0	93.5	2.6
15-24							
25-34	25.7	74.3	22.0	78.0	6.8	91.2	2.0
35-49	23.7	76.3	23.3	76.7	8.1	89.8	2.1
Total	**1342**		**1318**		**1342**		
Mother's place of Residence							
Urban	23.3	76.7	19.4	80.6	7.4	89.6	2.9
Rural	20.4	79.6	27.6	72.4	3.9	94.8	1.3
Total	**1342**		**1318**		**1342**		
Mother's Marital status							
Ever in union	24.2	75.8	23.8	76.2	7.6	90.6	1.9
Never in union	18.9	81.1	21.4	78.6	3.5	93.7	2.8

Total	**1342**		**1318**		**1342**		
Mother's Religion							
Christianity	22.7	77.3	21.8	78.2	6.2	91.3	2.5
Badimo	22.9	77.1	37.1	62.9	5.6	91.7	2.8
Others	19.3	80.7	25.7	74.3	5.0	94.1	0.9
Total	**1342**		**1317**		**1342**		
Mother's Education							
High	35.7	64.3	13.4	86.6	18.0	78.9	3.1
Secondary	21.4	78.6	21.8	78.2	4.9	92.5	2.5
Primary + low	15.1	84.9	29.9	70.1	2.5	96.4	1.1
Never attended	25.0	75.0	26.7	73.3	3.3	96.7	0.0
Total	**1279**		**1256**		**1279**		

Source: BFHS (2007)

Mother's Education

Stage of Antenatal care Attendance

The next most significant factor impacting on early timing of antenatal care was education. Those with secondary and higher education had the highest likelihood of early onset of prenatal care. On average 28.55 % of these women attending antenatal care early in the pregnancy while 15.1% of mothers with primary and lower education and one-fourth of those with those who never attended to antenatal care at the early stages. Mothers who had primary and lower education and those who had never attended school had the least likelihood of beginning antenatal visits early in the pregnancy. 71.5 % of those with secondary education attended antenatal care early in the pregnancy. The chi-square results strongly support this hypothesis. The pearson chi-square value is higher (25.591) and the significance level is less than the requared value of less than 0.05. On the evidence of this data, there is no doubt that education and the stage of antenatal care attendance associated.

Person seen for Antenatal Care

Most respondents (4.9%) who had secondary education sought antenatal care services from a doctor when compared to those who had never attended school (3.3%) and higher education (18.0%). Education is usually expected to empower women with life skills such that they can critically and objectively evaluate their course of action including the utilization of antenatal care services. The majority (92.5%) of those with secondary education was seen by a nurse for antenatal care. 96.4% of those with primary and lower education and 78.95% of those with higher education were seen by a nurse. The differences can be explained based on fertility and the desire to have children. Educated women tend to have few children. The Chi-square results, (Table 4.3) show that the Chi-square value was 55.580 with a significant level 0.000 which shows that there is an association between the level of education and the person seen for antenatal care. Education has been found to be a factor that influences the choice on who to be seen for antenatal care services in Botswana.

Number of antenatal care visits

The observed values (Table 4.2) reveal that a strong relationship exists between education and utilisation of antenatal care facilities. 78.2% of mothers with primary school education received adequate antenatal care. Higher proportion of mothers with higher education attended antenatal care. The chi-square result is high (18.375) with a significance level of 0.00 shows that a strong relationship exists between education and the utilisation of antenatal care in Botswana.

Mother's place of Residence

Stage of antenatal care attendance

The analysis of the data showed that 23.3% women in urban areas attended antenatal care early in the pregnancy compared to 20.4 % of those in rural area. The figures are consistent with the findings that were established in literature review as most of the studies indicated low turnover for antenatal care by women in rural areas compared to women in urban areas, (Asiimwe, 2011; Owino, 2009 and Navaneetham & Dharmalingam, 2002). Early attendance to antenatal care is important during the first three months of pregnancy but the analysis show that there is low attendance in rural areas which is not good for the developing organs and health of the mother. Late attendance to antenatal care was also common in both urban (76.7%) and rural (79.6%) areas. The Pearson chi-square results (1.571) with a significance level (0.210) which indicates that there is no adequate evidence to prove significant association between place of residence and the stage of antenatal care visits were initiated.

Person seen for antenatal care

The analysis showed that 7.4% of women in urban areas where seen by a doctor for antenatal care compared to 3.9% of women in rural areas. This was a high percentage given the fact that in urban areas the distribution of health care centers is large compared to the situation in rural areas. Further analysis showed that the majority (94.8%) of women in rural areas were seen by a nurse for antenatal care services while in urban areas those who were seen by a nurse for antenatal care were 89.6%. It can be pointed that mothers in urban areas have a choice to be seen by a medical doctor or a nurse while in rural areas the health institutions are manned by nurses only. The variable *other person* was popular among the respondents (2.9%) in women in urban area as compared to those in rural areas (1.3%). Based on the Chi-square analysis, the study found that there was no association between place of residence and the person who was seen for antenatal care services in Botswana, though one would have expected more women in urban areas to have seen a doctor and nurse as compared to those in rural areas.

Number of antenatal care visits

It was found that 19.4% of women in urban areas had inadequate antenatal check-up, while 27.6% of women in rural areas had inadequacy after antenatal care. There has been a twist with regards to the number of antenatal visits when looking at those who had adequate antenatal care checkups. Consequently, 80.6% of urban women and 72.4% of those had adequate antenatal care check-ups.

Table 1.2 Chi-square values of women who used antenatal care services in Botswana by selected socio-demographic characteristics.			
	Stage of ANC attendance	**Number of ANC attendance**	**Person seen for ANC**
Mother's Age (years)	X^2= 12.204**** df =2 Sig. =0.002	X^2= 0.485**** df =2 sig. =0.785	X=6.528**** df=4 sig.=0.163
Mother's Place of Residence	X^2= 1.571**** df =1 sig. = 0.210	X^2= 12.390**** df =1 sig.=0.000**	X^2= 11.789**** df =2 sig. =0.003**
Mother's Marital status	X^2= 5.000**** df =1 sig.=0.025**	X^2= 0.996**** df =1 sig.= 0.318	X^2= 10.342**** df =2 sig. =0.006**
Mother's Religion	X^2 =0.474**** df=2 sig.=0.789**	X^2=5.711**** df=2 sig.=0.058**	X^2= 2.623**** df =4 sig. =0.623
Mother's Education	X^2=25.591**** df=4 sig.=0.000**	X^2=18.376**** df=4 sig.=0.001**	X^2= 55.580**** df =8 sig. =0.000**

****x^2 is the Pearson Chi-square value
** Significant at<0.05

Analysis of Chi-Square Results
Stage of antenatal care attendance
Mother's Age

There is no difference among the age groups and the stage of antenatal care check-up. This is evidenced by a Chi-square value of 12.204 which is higher than tabulated value of 5.99 with 2 degrees of freedom and a critical value of 0.05.

Mother's place of residence

The computed value (5.278) for mothers' place of residence is higher than the tabulated value (1.571) with critical value of 0.05 and 1 degree of freedom. As a result, there is no difference when it comes to place of residence and the stage on which antenatal check-up was done in a pregnancy.

Mother's marital Status

The critical value of marital status and stage of antenatal attendance shows that the computed value (5.000) is higher than the computed value (3.84) and 1 degree of freedom at a critical value of 0.05. As a result, this shows that there is no difference in the stage of antenatal care attendance per marital status.

Mother's religion

With religion, it was observed that the computed value is (0.474) less than the tabulated value (5.99) with 2 degrees of freedom. That is evidence that there is no difference when analysing different religion groups and attendance for antenatal care. Religion does not influence differences in the stage at which women attended antennal care.

Mother's education

The computed value of the chi-square is 24.591 while the tabulated value is 5.99. This means that there is a difference with the stage of antenatal care attendance with the level of education. Women who had no education when compared with those with secondary education tend to attend antenatal care check-up during the early stages of their pregnancy. The significance level is 0.000 which also shows that education strongly influenced the stage at which antenatal care was done.

Number of antenatal care attendance

Mother's age

The computed chi-square value is 0.485 while the critical chi-square value is 5.99 at 2 degrees of freedom. The computed value is lower than the tabulated value which means that there is no association between ages and the number of antenatal attendances. The significance value is more than 0.05 which reflects that there is no association between the two variables.

Mother's place of residence

The computed chi-square value is 12.390. Value, at 1 degree of freedom, is 5.99. This means that there is a difference with place of residence and the number of antenatal attendance, the significance level is less than 0.05. It has been observed that the number of antenatal care attendances is a function of place of residence as those in urban areas registered more attendances to antenatal care compared to those in rural areas.

Mother's marital status

On marital status, the computed chi-square value is 5.000 while the tabulated value at 1 degree of freedom which is 3.84. This means that there is no difference when it comes to marital status and the number of antenatal care check-ups. This is also confirmed by the significance which is greater than 0.05.

Mother's religion

The computed chi-square value is 0.474 while the tabulated value at 2 degrees of freedom, 5.99 which is greater than the computed value. As a result, this shows that there is no difference when looking at religion and the number of antenatal attendances. The significance level is greater than 0.05 which also confirms no association between religion and the number of antenatal care check-ups.

Mother's education

When analysing the chi-square values it was observed that the computed value (25.591) is greater than the tabulated value (5.99) at 2 degrees of freedom. This means that with level of education, there are differences in the number of antenatal care check-ups. The significance value is lower than 0.05, as such the level of education has effect on the number of antenatal care attendances.

Person seen for antenatal care visits

Mother's age

The computed chi-square value is 6.528 while the tabulated value at 4 degrees of freedom is 9.84. The tabulated chi-square value is greater than the computed value at 4 degrees of freedom which means that there is no difference as to who was seen for antenatal care in different age groups. The significance level is greater than 0.05.

Mothers' place of residence

With place of residence the computed value is 11.789 while the tabulated value at 2 degrees of freedom is 5.99 at a critical value of 0.05. The analysis shows that there is a difference in who was seen for antenatal care with place of residence. The significance level is less than 0.05 which also confirms that their association between place of residence and the person seen for antenatal care.

Mother's marital status

The computed chi-square value is 10.342 while the tabulated value at 2 degrees of freedom is 5.99 at critical value of 0.005. The results show that there is a difference in who was seen for antenatal care with marital status. Above this observation the significance level is less than 0.05 which also tend to show that marital status and person seen for antenatal care are strongly associated.

Mother's religion

The computed chi-square value (2.623) while the tabulated value is 4 degrees of freedom and at critical value of 0.05 is 9.49. The tabulated value is greater than the computed chi-square value which means that there is no difference among respondents from different religions and the person seen for antenatal care. The significance level is also greater than 0.05 which reflected that there is no association between religion and person seen for antenatal care.

Mother's education

In education, the computed chi-square value is 55.580 while the tabulated value at 8 degrees of freedom is 11.07 at a critical value of 0.05. The significance level is lower than 0.05. This analysis shows that there is a difference regarding education level and person seen for antenatal care. The significance level shows that there is an association between level of education and the person seen for antenatal care.

RESULTS OF LOGISTIC REGRESSION

Table 4.4 presents the predictors of utilisation of antenatal care among pregnant mothers in Botswana. These factors can help us better understand and be able to have some useful information in planning for reproductive and maternal care service for the population. Separate logistic regression models were used for evaluating the effects of individual and socio-economic factors on the probability for use of antenatal care services.

For the i^{th} individual, this model can be expressed as:

$$\ln P_I / (1-Pi) = ß_0 + \sum ß_k x_{ki} \quad or\ Xi = exp\ (X_i\ ß)/1+ exp\ (X_i\ ß)$$

where, PI_{is} the probability that the i^{th} woman will use antennal care services, $ß_0$ is the baseline constant, xki ***is*** an array of **(k)** independent variables, and **ß** is the corresponding vector of unknown regression coefficients. The Binary logistic regression was used to estimate regression coefficients through the high likelihood of utilisation of antenatal care services. The betas show the change in the log odds due to unit increments in values of the predictors. Interpreting logistic regression results in terms of odds, $e^{ß}$, is a summary statistic for the partial effect of a given predictor on the odds, controlling for other predictors in the model. It was noted that although cross tabs were used for investigating the relationship between bivariate variables, the results would lead to conclusions where potential confounding variables are not controlled and this influenced the use of logistic regression analysis in this study. Table 4.4; 4.5 & 4.6, show the results of logistic regression analysis on the use of antenatal care check-up. The odds ratios and confidence intervals are presented in the same tables. The results show the logistic regression analysis which controls for independent variables which were: age, religion, education, place of residence and marital status.

Stage of antenatal care attendance

Mother's age

The results of logistic regression model on the dependent variable whether the first antenatal check-up was done early in or late in the pregnancy are given in table 4.4. Determinants such as religion of the mother, education level of the mother, mother's place of residence and the marital status of the mother were significant predictors of obtaining antenatal check-up early in the pregnancy in Botswana. In general, low age ranges of the mother were associated with late likelihood of obtaining antenatal care check-up early. Women aged 15-24 years were 1.235 times more likely to attend antenatal care early when compared to those aged 35- 49 years. This could be because at this age group 15-24 years, the mothers are young with less experience and fear such that any pain would make them panic and rush for a check- up. The significant level is greater than 0.05. The other explanation to this observation could be that women at age 35-49 years can make decisions when it comes to having babies as they prioritise unlike teenagers. Women aged 25-34 years were 0.951 times less likely to attend antenatal care early in the pregnancy as compared to those aged 35- 49 years and the significant level is greater than 0.05.

Mother's religion

Religion is a social grouping that may not be an important factor in attending antenatal care early in the pregnancy. It became significant for the stage of antenatal attendance. Thus, mothers who were Christians were 1.02 times more likely to attend for antenatal check-up early when compared to those who belonged to the ***other category*** with significant level higher than 0.05. It was also observed that those women who belonged the Badimo traditional religion were 0.60 times less likely to attend antenatal care early when compared to those who belong to the ***other category*** during the pregnancy with significance level greater than 0.05.

Mother's education

Education was an important predictor for receiving antenatal care early in the pregnancy. It is positively associated with early antenatal care attendance. There was, however, a significant difference between rural and urban mothers regarding the stage at which antenatal care was visited in Botswana. Mothers aged 15-24 ages were 1.2 times more

likely to attend antenatal care early than those aged 35-49. It was 0.95 times for mothers aged 25-35 years. The relationship between age and stage at which antenatal care was attended was not significant during the survey.

Education did not show any relationship with the stage of pregnancy at which antenatal care services were used. The analysis shows that at all levels of education on average mothers was 0.00 likely to use antenatal care services early in their pregnancy when compared to those with no formal education. The results from logistic regression analysis controlling for age, marital status, socioeconomic status, and place of residence was expected to show that women with higher education and those with secondary education were more likely to attend antenatal care check-up early in a pregnancy compared to women with primary and lower education (Table 4.4). Women with higher education were 0.00 times likely to attend early to antenatal care compared to the women with no formal education with a significance level of 0.999. On the evidence of this data there is no doubt that there was no association between the stage at which antenatal check-ups were made and the level of education.

Table 1.3 Predictors of the stage of antenatal care attendance (Logistics Regression)

Variables	B	Odds ratio	Significance level	95% confidence interval for exp(B)	
				Lower	Upper
Mother's Age					
15-24	0.211	1.235	0.512	0.657	2.322
25-34	-0.050	0.951	0.861	0.543	1.665
35-49		1.000			
N		**1342**			
Mother's Religion					
Christianity	0.018	1.018	0.950	0.588	1.761
Badimo	-0.507	0.602	0.399	0.185	1.957
Other		1.000			
N		**1342**			
Mother's Education					
Never attended	-18.443	0.000	0.999	0.000	-
Primary	-18.501	0.000	0.999	0.000	-
Secondary	-18.689	0.000	0.999	0.000	-
Higher Ed	-19.550	0.000	0.999	0.000	-
Non-Formal Ed		1.000			
N		**1279**			
Mothers place of Residence					
Urban	-0.292	0.747	0.191	0.482	1.157
Rural		1.000			
N		**1342**			
Mother's Marital Status					

Ever in union Never in union **N**	-0.317	0.728 1.000 **1342**	0.142	0.477	1.112

The group with 1.000 is the reference category.
**Significant at p<0.05
Cl= Confidence interval

Mother's place of residence

Women residing in urban areas were 0.75 times more likely to go for antenatal check-up early during a pregnancy when compared with those residing in rural areas, with a significance level more than 0.05. The explanation to this may be that there are more health facilities in urban than in rural areas in Botswana.

Mother's marital status

A higher proportion woman ever in union did not avail antenatal care services (Table 4.3). About a fifth of women ever in union attended antenatal check-up early in a pregnancy compared to women never in union. The marital status of women did not display significant effects on the patterns of use of antenatal care services, after controlling for age, education, and socioeconomic status. The estimated values (odds ratio) for dependent variable, marital status of the mother is tabulated. Table 4.4 indicate that mothers ever in union were 0.73 times most likely to have attended antenatal care early in the pregnancy than mothers never in union. Mothers ever in union might have received encouragement from their partners on the need for early antenatal attendance. The data did not show any variation when the logistic regression when run.

Table 1.4 Predictors of the number of antenatal care visits (Logistics Regression)					
Variables	**B**	**Odds ratio**	**Significance level**	**95% confidence interval for exp(B)**	
				Lower	**Upper**
Mother's Age					
15-24	-0.218	0.804	0.310	0.527	1.226
25-34	-0.104	0.901	0.603	0.609	1.334
35-49		1.000			
N		**1318**			
Mother's Religion					
Christianity	0.143	1.154	0.414	0.818	1.628
Badimo	-0.427	0.652	0.276	0.302	1.406
Other		1.000			
N		**1317**			
Mother's Education					
Never attended	0.815	2.258	0.322	0.450	11.328
Primary	0.550	1.732	0.482	0.374	8.019
Secondary	0.976	2.654	0.213	0.571	12.328
Higher Ed	1.442	4.229	0.076	0.860	20.790
Non-Formal Ed		1.000			
N		**1256**			
Mother's Residence					
Urban	0.320	1.376	0.021**	1.048	1.807
Rural		1.000			
N		**1318**			
Mother's Marital Status					
Ever in union	-0.179	0.836	0.203	0.635	1.101
Never in union		1.000			
N		**1318**			

The group with 1.000 is the reference category.
**Significant at p<0.05
Cl= Confidence interval

Number of antenatal care attendance

Mother's age

Women aged 15-24 years were 0.80 times more likely to have had adequate antenatal check-ups in a pregnancy compared to those aged 35-49 years. It was also observed that mothers aged 25-34 were 0.90 times more likely to have had adequate antenatal care visits in a pregnancy. The significant level was greater than 0.05 which shows that there was no significant association between age and the adequate antenatal check-ups in a pregnancy.

Age of the mother was not associated with the adequate number of antenatal care visits in a pregnancy.

Mother's religion

Christian women were 1.15 times more likely to have had adequate antenatal check-up during a pregnancy when compared to those women in the category **other**. While those women who belonged to the Badimo religion were 0.65 times more likely to have had adequate antenatal check-up during a pregnancy when compared to those mothers who belong to the religion group ***other***. The significant level is greater than 0.05 for those mothers who were Christians and those who belonged to Badimo religion, which means that religion and utilisation of antenatal care services are not strongly associated.

Mother's education

The logistic regression analysis controlling for age, marital status, socioeconomic status, and place of residence indicated that women with higher education and those with secondary education were more likely to have had adequate antenatal check-up (Table 4.5) compared to those women with no formal education. Women with higher education were 4.23 times more likely to receive adequate antenatal care when compared to the women with no formal education with a significance level of 0.076. On the evidence of this, it may be concluded that there is a strong association between the adequate antenatal check-up and the level of education.

Mother's place of residence

The urban–rural status of women displayed significant effects on the patterns of use of antenatal care services, even after controlling for age, education, marital status, and socioeconomic status. The logistic regression analysis indicated that the urban women were 1.38 times more likely to use antenatal care services compared to the women living in rural areas (Table 4.5). Urban women were 1.38 times more likely to have had adequate antenatal check-ups during a pregnancy when compared with women in rural areas. The level of significance less than 0.05, which is an indicator of a strong association between place of residence and adequate utilisation of antenatal care services.

Mother's Marital Status

Women ever in union were 0.84 times more likely to have had adequate antenatal check-ups compared to women never in union. The significance level was greater than 0.05 which indicates that the marital status of a mother does not influence utilisation of antenatal care services in Botswana.

Table 1.5 Predictors of person seen for antenatal care visits (Logistics Regression)					
Variables	**B**	**Odds ratio**	**Significance level**	**95% confidence interval for exp(B)**	
				Lower	**Upper**
Mother's Age					
15-24	-0.079	0.924	0.896	0.284	3.006
25-34	-0.360	0.698	0.535	0.224	2.177
35-49		1.000			
N		**1342**			
Mother's Religion					
Christianity	0.961	3.614	0.194	0.613	11.148
Badimo	1.455	4.284	0.247	0.364	50.405
Other		1.000			
N		**1342**			
Mother's Education					
Never attended	17.059	2.6E+07	0.999	0.000	-
Primary	16.448	1.4E+07	0.999	0.000	-
Secondary	17.247	3.1E+07	0.999	0.000	-
Higher Ed	17.321	3.3E+07	0.999	0.000	-
Non-Formal Ed		1.000			
N		**1279**			
Mother's place Residence					
Urban	0.787	2.196	0.083	0.903	5.340
Rural		1.000			
N		**1342**			
Mother's Marital Status					
Ever in union	-0.396	0.673	0.299	0.319	1.420
Never in union		1.000			
N		**1342**			

The group with 1.000 is the reference category.
**Significant at p<0.05
Cl= Confidence interval

Person seen for antenatal care visits

Mother's Age

Women aged 15-24 years were 0.92 times more likely to have seen a health professional for antenatal check-ups in a pregnancy compared to those aged 35-49 years. It was also observed that women aged 25-34 years were 0.70 times more likely to have seen a health professional for antenatal check-up in a pregnancy when compared to women aged 35-49 years. The significant level was greater than 0.05 for women aged 15-24 years and those

aged 25-29 years. This shows that there wasn't significant between age and the person seen for antenatal check-up in a pregnancy. Mothers within the youth age were found to have more visits to health professional for antenatal care in comparison with mothers aged 34-49 years.

Mother's religion

Christian women were 3.61 times more likely to have seen a health professional for antenatal check-up during a pregnancy when compared to those women in the category ***other*.** While those women who belonged to the Badimo religion were 4.28 times more likely to have seen a health professional for antenatal check-up during a pregnancy when compared to those women whose religion was ***other***. The significant level is greater than 0.05 for Christian women and those women who belonged to Badimo religion which indicates that religion and person seen for antenatal care services are not strongly associated. The differences perceived in religion is that religious groups hold different philosophical aspects that even have modelled their behaviour. A case of a Muslim mother who may not be willing to be examined by a male doctor is a good example.

Mother's education

The logistic regression analysis controlling for age, marital status, socioeconomic status, and place of residence indicated that education did not significantly influence the person who was seen for antenatal check-up (Table 4.6). Women with higher education were 17.321 times more likely to have seen a health professional when compared to women who had no formal education. Women who had no education were 17.059 times more likely to have seen a health professional compared to those with no formal education. A level of significance greater than 0.05 indicates that there is no association between women seen for antenatal check-up by level of education. On the evidence of this, it may be concluded that there is no association between the person seen for antenatal check-up and the level of education in sampled population.

Mother's place of residence

The urban–rural status of women displayed significant effects on the patterns of use of antenatal care services, even after controlling for age, education, marital status, and socioeconomic status. The logistic regression analysis indicated that the urban mothers were 2.20 times more likely to have seen a health professional for antenatal care services compared to the mothers living in rural areas (Table 4.6). The level of significance level was greater than 0.05 which is an indicator that there was no association between place of residence and utilisation of antenatal care services.

Mother's marital status

Mothers ever in union were 0.67 times less likely to have seen a health professional for antenatal check-ups compared to women never in union. The level of significance was greater than 0.05 which indicates that marital status of mothers does not influence who they see for antenatal check-up.

Limitation of the Study

The current study has several limitations. First, the study used secondary data that limited the researcher from investigating the critical variables, such as distance from the

nearest facility, attitude of healthcare providers towards clients, waiting time to receive assistance, and costs. These variables are thought to influence the decision to use antenatal care services. Second, since the data used is quantitative in nature, the researcher is limited to providing insights into why some women prefer using traditional antenatal attendants rather than modern health professionals. These insights can only be obtained through qualitative approaches, such as focus group discussions and in-depth interviews. It is, thus, important to conduct qualitative research to augment what is generated from the quantitative data.

Both formal and non-formal education and place of residence were positively associated with the utilization of antenatal care services. Consequently, both the economic and educational improvement of the poor mothers would have a reinforcing effect on improved antenatal care utilization, so they both need to be strengthened. Nevertheless, there are other factors such as lack of access to, and information regarding antenatal care services and adequate health care services that also influences the use of antenatal care services. An increasing number of uneducated mothers are taking up private education programs that would improve their way of doing things about the utilisation of antenatal care services. Their participation could enhance their decision-making power about antenatal care service utilization. In addition, medical health insurance programs where most employed mothers are members can also promote affordable health care and enhance access to quality care in any health providing institution in the country. Free medication in government health institutions is a pro-poor measure which is likely to reduce inequality and inequity in access to, and utilization of, both antenatal and preventive health services. All these will enable Batswana to overcome barriers and realise the Millennium Development Goals with reference to MDG 5 by the year 2015 (United Nations, 2006).

Discussion

Not all the demographic, socio-economic and socio-environmental characteristics analysed were found to be significant determinants of women's utilisation of antenatal care services. This is an unexpected result because it has always been assumed that educated mothers and those living in urban areas had the autonomy to make decisions that have positive impact on their health. It was observed in this study that education of any level had influence in the utilisation of antenatal care. On the contrary, it was realised that mothers from rural areas were more active in the utilisation of antenatal care during the first trimester while a significant proportion of those residing in urban areas were active during the second trimester. The difference between urban and rural mothers on this was minimal during the first trimester. Accordingly, my observation could be that Botswana has attained a high level in the provision of health education to her citizens. It was noted that health facilities are fairly located to give residents close to five kilometres, even though some areas still lack in general coverage on maternal health care whch has been greatly realised.

Most mothers belong to women's groups and associations where they can share life experiences, ideas with other women. Generally, these groups were tribal, ethnic or village associations, which cut across the whole society. This would mean that pregnant mothers get ideas on antenatal care services from these social meetings.

Interestingly, age was found to be negatively associated with antenatal care visits. That is, the younger (teenage) the mothers the less likely she is to use antenatal care services. Older generations of pregnant mothers are closely attached to cultural values and they may count themselves experienced in delivering babies. This is likely to impede the pregnant

mothers on the utilisation of antenatal care. The fact that old age is negatively associated with utilisation of antenatal care services, would also indicate that the higher the social status that comes with aging is closely associated with the utilisation of antenatal care services. Education was found to be a major factor on the utilisation of antenatal care services. An increase in the education level of the mother increased the probability of the mother being empowered to use antenatal care services effectively. The effect of education operates through knowledge, and self-confidence and it enables them to participate in antenatal care services. Traditional values and norms which do not encourage utilisation of antenatal care services can be overcome by both formal and informal education. It, therefore, helps mothers to know, when to make use of the antenatal care services. Similarly, education makes the pregnant mother to take charge of her health during pregnancy and understand the results of nonattendance to antenatal care services.

Religious affiliation of the pregnant mother is significantly associated with usage of antenatal care services. Particularly, pregnant women who are Christians were more likely to use antenatal care services than other religious groups. This could be attributed to the fact that Badimo and other (Muslim, Hindu etc) have a tendency of living in closed communities, allowing mothers less freedom of association with other social groups. Overall, the study's findings reveal that demographic, socio-economic characteristics and socio-environmental factors have an impact on pregnant mothers' usage of antenatal care services. Overall, education negatively affects fertility because educated mothers tend to have a small number of children which translates to low population increase and positively affects antenatal care use.

Conclusion

Use of antenatal care services is important and necessary for the effective reduction of mortality rate and morbidity, and in reducing complications during delivery and thereafter. The study found that factors responsible for women's utilisation of antenatal care services included mother's age, mother's level of education, mother's place of residence (rural, and urban), mother's religious affiliation and mother's marital status. Education was found to have a negative impact on fertility and a positive impact on antenatal use. Thus, it appears that education could contribute in improving reproductive health (antenatal care). There is, therefore, a need for a deliberate policy to empower women. Such a policy should effectively involve all age groups of both genders. In addition, the policy of universal basic education and that of a harmonious integrated development of health institutions in both rural, and in town has yielded positive results in the utilisation of antenatal care services. The study sought to identify factors that influence the use of antenatal care services in Botswana and will single out factors that lead to variation in the utilisation of antenatal services. There was inadequate information at present regarding the level of utilisation of antenatal care services in the Botswana. The Mothers' age, Place of residence and marital status did not show a significant utilisation of antenatal care and education became the key factor in the utilisation of antenatal care services. This can be attributed to the fact that education liberates and informs decision making such that when information is passed to the community they receive it differently depending on the level of education. A variable like place of residence may have impact if the spatial distribution is in such that health facilities are not evenly distributed on which in this study they were found to be evenly distributed.

Recommendations

It is recommended that all facilities at this level of care, especially the comprehensive health centres, be equipped with capacity to detect anaemia and proteinuria to improve the quality of antenatal care services. Iron and foliate supplements in pregnancy should be intensified while health workers are encouraged to adhere to the national health ministry's recommendation on malaria prophylaxis in pregnancy. Evaluation of these interventions on quality of maternal health service is suggested. Continuity of care is a well-researched area which shows that mothers value not only continuity but also their place of birth and the right of control over their own bodies. Mothers do not want fragmented care from multiple care givers who provide conflicting and inconsistent information. This is usually the case when pregnant mothers go for antenatal check-up. Research shows that women who have this type of care have far greater outcomes, including a decreased need for pain relief, lower episiotomy rate, less interventions and a smoother transition to motherhood. What has been observed from literature is that some issues of concern are not addressed in some clinics in Botswana. The Ministry of Health should allow midwives to work independently, as well. This will allow them to be flexible about the care they could provide to pregnant women; working in partnership, directed by the wishes of women and their families. Women should be empowered through education to exercise their right to make informed choices about their caregivers, their place of birth, and any interventions that may be suggested or recommended by the care provider or care provider's policy during pregnancy, labour, birth or early parenthood.

Botswana should adopt a woman-centred approach to the pregnancy. Botswana should support the concept of providing one-on-one midwifery care from a known midwife for every woman like it is in developed countries. Research evidence shows that this is the golden standard for pregnancy, birth and postnatal care. It is also necessary to design programs in electronic media (radio and television) which will specifically address issues on antenatal care provision. However, education on antenatal care services should be encouraged by government and donor agencies for example, a column can be reserved on the Botswana Daily News in local language, may be once a week on antenatal care provision. It is important for the antenatal care providers to provide friendly and open communication to Antenatal Clinic Attendees. Certain essential information must be provided to all women as follows:

- A delivery plan: the estimated date and place of delivery
- Five danger symptoms which pregnant women should immediately report to the planned place of delivery; for example, severe headache, abdominal pain, reduced foetal movement, passage of liquid from the vagina, or ante-partum haemorrhage.
- The information to include aspects of self-care in pregnancy and advice on childcare. Antenatal classes and exercises should be provided to all women attending to antenatal clinic.
- Routine tests that are not performed: this informs pregnant women that certain expensive test for example, rubella serology and triple screen, are not done routinely by the ordinary antenatal clinics, although they might on occasionally, present serious foetal challenges.
- Information leaflets that summarise the advantages of attending antenatal care service early and disadvantages of not attending antenatal care service should be produced and distributed to hospitals and clinics, to suit local conditions and language, and be handed out to pregnant women when attending an antenatal clinic. However, this should not replace the need for effective face to face communication.

- The presence of partners attending with the pregnant women should be encouraged, whether these are husbands, partners, boyfriends or other family members.
- All antenatal care clinics in Botswana should be equipped with ultrasound scan machine to reduce referrals which are characterised by long queues and stretching the distance of service delivery to client.

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