

**PREGNANCY OUTCOMES OF WOMEN WITH EARLY AND LATE
ANTENATAL CARE BOOKING AT SINZA HOSPITAL,
DAR ES SALAAM.**

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**MMed (Obstetrics and Gynecology) Dissertation
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**Muhimbili University of Health and Allied Sciences
School of Medicine**



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By

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**A Dissertation Submitted in (Partial) Fulfillment of the Requirements for the
Degree of Master of Obstetrics and Gynecology of**

**Muhimbili University of Health and Allied Sciences
October, 2020**

CERTIFICATION

The undersigned certifies that he has read and hereby recommends for acceptance of dissertation entitled “ **Pregnancy outcomes of women with early and late antenatal care booking at Sinza Hospital, Dar es salaam**” in partial fulfilment of the requirements for the degree of Master of Medicine in Obstetrics and Gynaecology of Muhimbili University of Health and Allied Sciences.

Dr. Ali Said
(Supervisor)

Date: _____

DECLARATION AND COPYRIGHT

I, **Samira Y. Salim**, declare that this dissertation is my own original work, and that it has not been presented and will not be presented to any other university for a similar or any other degree award.

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LIST OF ABBREVIATIONS

ANC	Antenatal Care
DHIS	District Health Information System
FANC	Focused Antenatal Care
MoHCDGEC	Ministry of Health ,Community Development, Gender, Elderly, and Children
TDHS	Tanzania Demographic and Health Survey
WHO	World Health Organization
HIV	Human Immunodeficiency Virus
MMR	Maternal Mortality Ratio
GA	Gestational Age

OPERATIONAL DEFINITIONS

Pregnancy outcomes

Includes obstetric complications; Maternal such as Anemia in pregnancy, Obstetric hemorrhage, Gestational diabetes, Hypertensive disorders in pregnancy, modes of delivery and maternal death.

Neonatal such as Low Apgar score, Low birth weight, Preterm birth and fetal mortality.

Early ANC booking:

First antenatal care visit before 16 weeks of gestation

ABSTRACT

Background: Antenatal Care (ANC) often presents the first contact opportunity for a pregnant woman to with health services thus offering an entry point for integrated care, promoting healthy practices, influencing health seeking behaviors, and linking women with pregnancy complications to a referral system. Antenatal care attendance reduces maternal and perinatal morbidity and mortality through detection and treatment of pregnancy-related complications and identification of women at increased risk of developing complications during labor and delivery.

Objective: This study aimed at determining the proportion of women with early and late ANC booking, and compared the provision of first visit antenatal care components and pregnancy outcomes among women delivered at Sinza hospital October to November 2019.

Methodology: A hospital based cross-sectional study was conducted at Sinza Hospital from 17th October to 21st November 2019. Systematic sampling was used to reach a sample size of 320 women. Data was collected using a structured Swahili Questionnaire. Variables such as early and late booking defined as booking before 16 weeks and after 16 weeks of gestation respectively, components of first ANC visit and pregnancy outcomes such as Anemia in pregnancy, Gestational diabetes, hypertensive disorders in pregnancy, cesarean delivery, Spontaneous vertex delivery, obstetric hemorrhage, low Apgar score, low birth weight, preterm delivery and perinatal deaths were coded, entered, cleaned and analyzed using Statistical Package for Social Sciences (SPSS) version 23.0. Descriptive statistical analysis was done to determine the proportion of women with early antenatal care booking, to compare provision of first visit antenatal care components between women with early and late ANC booking, compared the outcomes and to determine the association between time of ANC booking and pregnancy outcomes (maternal and fetal). Chi square test was done to determine the association and p-value <0.05 was considered statistically significant. Results were summarized and presented using frequency distribution tables, figures and texts.

Results: The proportion of women with early(<16wks GA) ANC booking among women delivered at Sinza hospital was 32.8%. The proportion of women with early(<16wks GA) ANC booking among women delivered at Sinza hospital was 32.8%. The ANC services offered to most clients who booked early and late respectively were history of the participants(100%, 93.5%), HIV test(100% ,84.7%), hemoglobin test (99.1%,80.9%), blood Grouping test (99.1%,84.7%), iron supplements (98.1%,85.1%) and client counselling (91.1%,93.5%). Fetal mortality (p value =0.049) was significantly associated with late ANC booking. Fetal mortality (p value =0.049) was significantly associated with late ANC booking.

Conclusion: Only a small proportion of women booked for first trimester ANC. The provision of first visit ANC components was adequately offered in the group that booked early. Only perinatal deaths among the pregnancy outcomes, showed significant association with late ANC booking.

1.0 INTRODUCTION

1.1 Background

Antenatal care for positive pregnancy experience is a World Health Organization (WHO) model goal-oriented Antenatal Care (ANC) which is timely, friendly, beneficial and safe to a pregnant woman which recommends eight contacts(1). In Tanzania we still use Focused antenatal care (FANC) adapted from WHO. The basic FANC model consists of 4 antenatal visits in which at each visit women are counseled on birth preparedness, danger signs, nutrition, exclusive breast feeding and family planning(2).

Antenatal care is one of the four pillars of the initiative for safe motherhood intended to provide safe pregnancy and delivery, as well as health awareness on the benefits of antenatal care services. Antenatal care provides the opportunity to monitor pregnancy, detect and treat anomalies of pregnancy and to deliver preventive health services such as immunization and HIV testing and counselling. While the timing of ANC varies between high and low income

countries, there is almost common understanding that ANC attendance is a lifesaving intervention for pregnant women and fetus (3). Antenatal care for the first trimester is fundamental and decisive to identify and evaluate the risk factors usually present before pregnancy.

The 2014 Tanzania FANC model recommends that all women to attend first antenatal clinic below 16 weeks, second visit (20-24 weeks), third visit (28-32 weeks), and fourth visit (36 weeks).

However, although ANC services are free and the majority of the women have access to them, most women initiate ANC late(4–6). In Tanzania it is estimated that only 24% of pregnant women attend their first antenatal visit in the first trimester.(7)Existing evidence from most high income countries indicates that few women seek ANC services early in the course of pregnancy, yet for pregnant women to have optimal pregnancy outcomes they need access to

antenatal care services beginning in the first trimester for early identification of complications(2).The proportion of women who initiate ANC according to the recommended guidelines in high income countries is very low (4,6)

The first trimester ANC visit which is the first contact between the pregnant woman and the health care provider is important because it gives the opportunity to the health care provider to give the initial health education to the pregnant women so that they could plan their delivery and understand the importance of antenatal care. Mothers who book for ANC late miss the opportunity to have focused ANC during their pregnancy and thereby risk having adverse outcomes for their pregnancy or their unborn babies. They also miss the opportunity of early detection of HIV and STDs, malaria and anaemia prophylaxis, health education and treatment or prevention of complications.(8) Also during first trimester visit, remedial actions and treatment of previous medical conditions are undertaken so as to improve pregnancy outcomes.(9)During this visit, comprehensive history, examination, and investigations are taken to make sure that the woman has no any risk factor which could lead to late adverse pregnancy outcome(2).

According to WHO, early ANC refers to initiation of antenatal care as soon as possible after confirmation of pregnancy and or within the first 12 weeks of gestation. (1) Early initiation of antenatal care plays a major role in detecting and treating some complications of pregnancy and forms a good basis for appropriate management during delivery and after childbirth. Failure to attend antenatal care early results in the potential for complications during pregnancy, delivery, and puerperium and hence increasing maternal mortality rate. Mothers who attend antenatal care late miss the opportunity to have early detection and prevention of both infectious and non-infectious diseases in pregnancy.

The optimum number of ANC visits for limited resource settings depends not only on effectiveness of the health facility, but also on costs, distance from the health facility and other socio-demographic factors/barriers affecting ANC access and utilization. A recent study from southern Tanzania found that health workers spent an average of 46 minutes providing

focused ANC to a first time client, and 36 minutes for a revisiting client. This was ten minutes more on average than the current practice and poses challenges for service delivery(10).

Adequate and optimal ANC has been proposed as one of the strategies to combat increasing maternal mortality rate (MMR)and to improve pregnancy outcomes.(11) Women are supposed to be educated and counseled regarding pregnancy-related danger signs during these visits, and that a delivery plan will be created so that readiness for emergency can be better assured.(12)

The World Health Organization advocates that adequate ANC should include at least four visits for any pregnancy.(13) However, recent studies have suggested that adequate and effective ANC should be upgraded to include the following four components which make up an Optimal ANC Package: at least four ANC visits, with the first visit in the first trimester, the last visit in the third trimester and with all the visits supervised by a skilled professional. The need for the attendance of four visits as stipulated by WHO is stressed and also the commencement of these visits as early as possible in the first trimester.(9)

The World Health Organization (WHO) recognizes the importance of antenatal care (ANC) within a continuum of reproductive and maternal-newborn care. Unfortunately, such a consistent, integrated continuum of comprehensive care although defined on paper, and codified in many national health policies often does not translate into actual practice .For example, while it is widely acknowledged that ANC is most effective if it is initiated early and consistently throughout pregnancy, many pregnant women initiate ANC late in pregnancy (during the second or third trimester) and do not receive the WHO-defined minimum of at least 4 ANC visits. Also information on the comprehensive coverage of first visit ANC interventions and services is still inadequate, so is the outcomes of pregnancies of early bookers in comparison to late bookers yet it has profound implications for improving the entire continuum of maternal and newborn child health settings. It is thus important to delineate the gaps, barriers and facilitators which impact access to this beneficial care.

1.2 Literature Review

1.2.1 Prevalence of women who booked for ANC early

Globally, in the period 2007–2014, only 64% of pregnant women attended the WHO-recommended minimum four contacts for ANC. This data suggested that much more work needs to be done to address ANC utilization and quality

In Africa the coverage for women receiving the recommended minimum number of antenatal visits varies. It has been found that, in Ethiopia and Nigeria the antenatal coverage is more than half, although late booking is still a problem and counseling on timely booking during ANC visit should be strengthened.(5,14) The coverage for 4 visits in Tanzania is approximately 43%, (14) and recently reported to be 51%(15). However, there are variations between the urban and rural population such that, more than half of urban women had more than four antenatal visits compared to only one third of rural women.

The situation of late booking is different from high income countries compared to low and middle income countries. In Europe and North America, the prevalence of late booking(booking after 12 weeks of gestation) ranges from 2.8% to 16% (16). Bucher *et al* showed variations of antenatal initiation in the first trimester in Argentine (37.4%) , Guatemala (31.5%), and Pakistan (24.1%) (17). In Ethiopia, one study reported that nearly half of the respondents made their first booking in the first trimester.(14) In Rwanda, it was reported that about 38% of pregnant women attend the first visit in the first trimester. (4)However, in Tanzania, only 24% of women attend their first antenatal visit in the first trimester (7).Less than half of women receive the recommended minimum number of visits and only 15.1% of them attend their first antenatal visit before the fourth month of pregnancy.(18).

These variations could be due to some factors including maternal education, husband's education, marital status, household income, cost, availability, media exposure, cultural beliefs, parity and history of obstetric complications. A study done in Cameroon had shown that the proportion of women who attended antenatal care in the first trimester was 20.5% (9). This percentage was similar to the 21.6% obtained in Zimbabwe, but quite higher than those obtained in Nigeria (7.6%), Uganda (16%) and Malawi (9%). In Eastern Sudan a higher proportion of 31% of women commenced ANC in the first trimester. Low prevalence of women commencing ANC in the first trimester from many studies seems to show a trend across Sub Saharan Africa where women do not book early for ANC. However, there are variations between urban and rural population and more information concerning timing of initiation of ANC needs to be captured especially in the urban settings as most studies have been carried out in rural settings. Also the actual gestation age at which pregnant women come are not documented thus need for studies to determine the time of gestation at which pregnant women make their first antenatal care visit is of paramount importance.

1.2.2 Maternal and fetal outcomes

A cross-section study done in Cameroon in 2016 with an objective of assessing pregnancy outcomes among women who attended and women who did not attend first trimester ANC reported that malaria in pregnancy occurred in 43% and neonatal death was low in women who did not attend first trimester. However, there was no significant difference in pregnancy outcomes among the two groups of women who attended and women who did not attend first trimester ANC (9).

A study done by Ambreen et al with the aim of determining the complications of late antenatal booking showed that the most reported maternal complications were anemia, diabetes, hypertension and abruption placenta while fetal complications were in the form of preterm labour and intrauterine fetal death (19). Similar findings were reported in a study done in Durban, South Africa in the department of Community health studies, in which maternal anemia occurred in more than half of the women studied and it was significantly associated with late antenatal care booking (20).

Another study done in Enugu, Nigeria showed that the prevalence of anemia in pregnancy at booking was high (40.4%) and recommended that early antenatal booking and improved antenatal care are necessary for early diagnosis and treatment of the condition(21) Similarly of quality ANC is recognized as an important opportunity for screening and early identification of complications such as pre-eclampsia, anemia, and gestational diabetes . However pregnant women who provided poor quality, attended less and late first visit were associated with an increased risks of stillbirth(22)

It is very important for pregnant women to book for antenatal care early, preferably in the first trimester of pregnancy, so as to detect and prevent any possible complications of pregnancy for the mother and the unborn child; thus, contributing to the reduction of perinatal morbidity and mortality(23) . Such practice can ensure good chances of safe delivery and delivery of healthy children(24).The global reduction of maternal mortality rate and a positive pregnancy outcome can only be achieved if the care offered to women during pregnancy improve and antenatal care is initiated early enough.

Maternal complications and poor perinatal outcome are highly associated with non-utilization of antenatal and delivery care services, with poorer outcomes in unbooked than booked parturients. Various studies have confirmed the positive influence of antenatal care on maternal and perinatal outcomes irrespective of other maternal characteristics, such as age and parity. Ekwempu, in a study on the influence of antenatal care on pregnancy, found that antenatal care was associated with a three-fold reduction in perinatal loss and virtual elimination of foetal loss from stillbirth (25). Health-seeking behaviour, as evidenced from the literature, may be related to health knowledge and consciousness of the individuals, and may have implications for health status and outcomes.

In the light of the current maternal mortality situation it is pertinent to determine and contextualize not only the relationship between the booking status of mothers and maternal health outcomes but also the timing of their booking and their pregnancy outcomes.

1.3 Conceptual Framework

Pregnancy outcomes (both maternal and fetal) are associated with several factors including timing, quantity and quality of ANC visits. In this study, timing of ANC initiation is considered. Outcomes among pregnant women who booked early and those who booked late were studied. Also ANC service provision was compared in both groups. Below is a conceptual framework for this study.

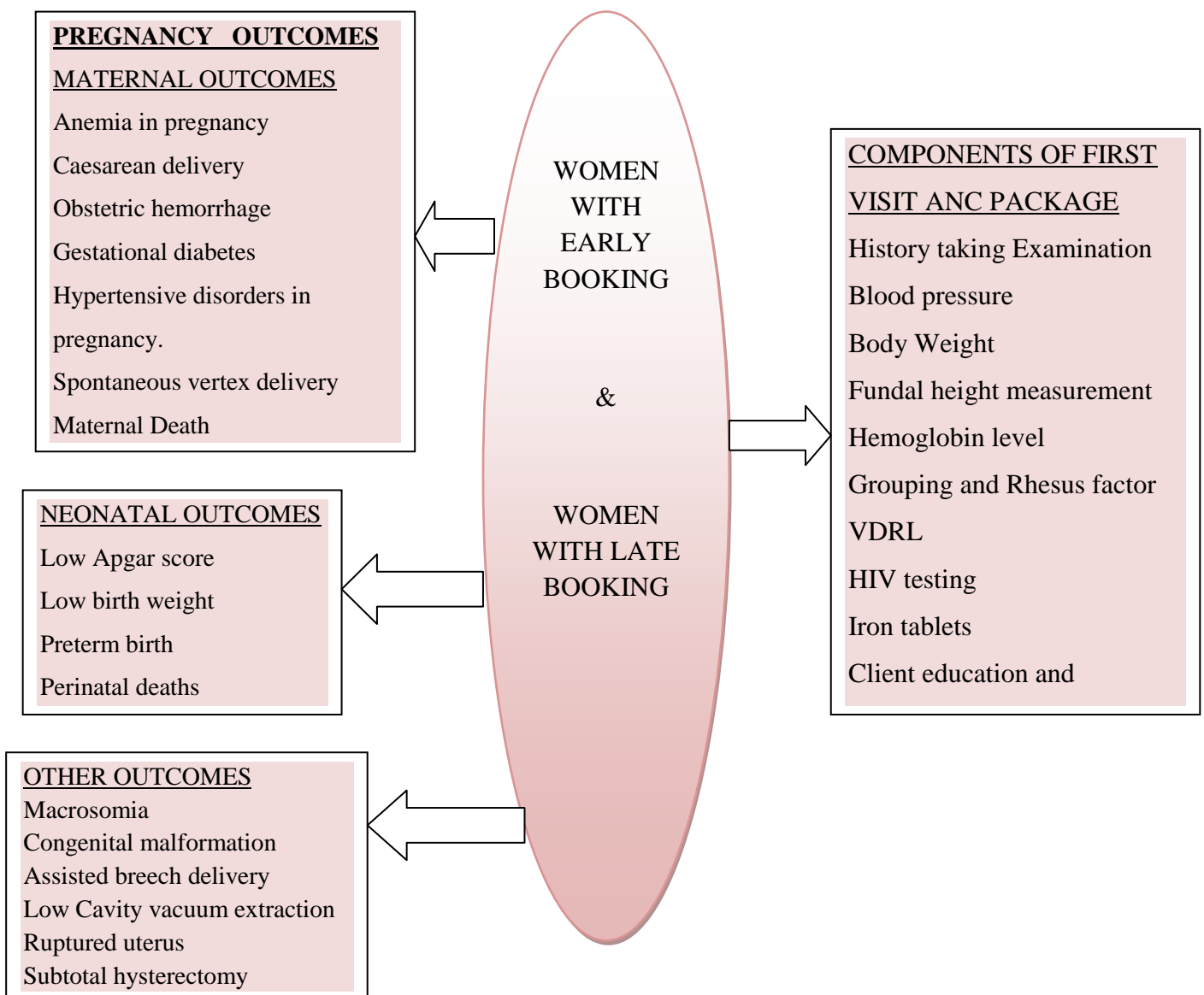


Figure 1: Conceptual framework

1.4 Problem Statement

First trimester antenatal care services are the entry point for the integrated management of different conditions with adverse effects to the mother and fetus. Being the most important gateway, still there is poor attendance of antenatal care visits among pregnant women which could lead into adverse pregnancy outcomes. TDHS, 2015 reported that, only 24% of women attend ANC in the first trimester(7). Tanzania Service Provision Assessment Survey 2014-2015 reports that only 15.1% of women attend their first antenatal visit before the fourth month of pregnancy(18). It was reported that first antenatal attendance starting above 20 weeks was associated with maternal anemia and low birth weight (20). Other pregnant related complications shown to be associated with late booking were hypertensive disorders of pregnancy and intrauterine fetal death (19). Despite of relatively high number of women attending antenatal care visits at Sinza hospital, information on timing of commencing ANC and pregnancy outcomes remain inadequate. Studies done in our set up have shown a positive correlation between unbooked mothers and an increased risk of maternal and foetal adverse outcomes and little is known on the impact of timing of ANC initiation on these similar outcomes (25,26). There is, therefore a need for more study to broaden knowledge on maternal and fetal outcomes and compare the sociodemographic characteristics among women who attended and women who did not attend first trimester antenatal care visit and to determine the correlation of maternal and perinatal outcomes. Mothers who attend antenatal care late miss the opportunity to have early detection of both infectious and non-infectious diseases in pregnancy.

1.5 Rationale

This study is going to reveal maternal and fetal outcomes of late antenatal attendance. It will motivate health care workers to insist and provide health education to women on importance of early antenatal booking in order for them to get appropriate and effective care during pregnancy. Several studies have shown that late attendance leads to poor maternal and fetal outcomes. Study findings will also provide data that will be used for subsequent studies and will provide investigators with data by which to further explore ANC in their own settings. Also identified key gaps for which stakeholders can develop targeted interventions by which to improve women's access to an integrated continuum of

respectful, comprehensive maternal-newborn and reproductive health services and in so doing strengthening the importance of timely seeking of ANC services.

1.6 Research Questions

1. What is the proportion of women with early and late ANC booking among women delivered at Sinza hospital from October to November 2019?
2. What is the difference in provision of first visit antenatal care components between postpartum women with early and late ANC booking?
3. What is the difference in pregnancy outcomes between postpartum women with early and late ANC booking?

1.7 Objectives

1.7.1 Broad objective

To determine the proportion of women with early and late ANC booking, compare the provision of first visit ANC components and pregnancy outcomes among postpartum women with early and late ANC booking at Sinza hospital from October to November 2019.

1.7.2. Specific objectives

1. To determine the proportion of postpartum women with early ANC booking.
2. To compare the provision of first visit antenatal care components between postpartum women with early and late ANC booking.
3. To determine the association between time of antenatal care booking and the pregnancy outcomes.

2.0 METHODOLOGY

2.1 Study design

A hospital based cross-sectional study.

2.2 Study setting

The study was conducted at Sinza district hospital, a public facility located in Ubungo, Dar es Salaam, Tanzania. The hospital has a maternity and outpatient department among others. It has monthly inpatient registry of 1200 patients, 75% of these being obstetric patients. It has one antenatal ward that admits pregnant mothers who require close monitoring and observation. Average number of deliveries conducted in one month at Sinza hospital is about 700, of which more than two thirds of them are vaginal deliveries. The labor room has 8 delivery beds whereby the post-delivery women are transferred to postpartum wards shortly after delivery. There are 3 postpartum wards. 2 wards are for post cesarean deliveries and one ward is for those who had vaginal deliveries. Each postpartum ward has approximately 10 beds. One doctor (a specialist/general practitioner/assistant medical officer) conducts the ward round in the postpartum ward on daily routine basis. Two to three registered nurses work in the postpartum ward daily, assisted by two medical attendants. Discharge of postpartum mothers is conducted twice in a day, morning and afternoon. Post vaginal deliveries are discharged after 12-24 hours or even earlier (premature discharge) due to limited space (congestion) in the postnatal ward. Those post caesarean section are discharged after 2-3 days. Mothers who develop complications following delivery and those whose babies need pediatrician care are referred to appropriate higher order institutions after appropriate initial steps of care.

2.3 Study population

All women delivered at Sinza hospital.

2.4 Study sample

All women who delivered within 24 hours at Sinza hospital.

2.5 Sample size

Sample size was derived from the following formula:

$$n = \frac{z^2 p (1-p)}{\epsilon^2}$$

Where:

Z: Standard normal deviate = 1.96 for 95% confidence level

P: Expected proportion of women who attended antenatal clinic in the first trimester, which is determined from TDHS 2015, whereby, the proportion of women who attended antenatal care visit in the first trimester was **24%**

ε: Margin error = 5%

Calculated sample size will be 290 women

Non response rate of 10% will be added to the calculated sample size

So the sample size will be $\{(10\% \times n) + n\}$ which is $29+290= 319$

Hence sample size will be **320**

2.6 Inclusion and exclusion criteria

2.6.1 Inclusion criteria

- All women who delivered within 24 hours.

2.6.2 Exclusion criteria

- Women who did not attend ANC

2.7 Sampling technique

After listing the participants who met inclusion criteria to create a sampling frame, systematic sampling technique was applied to obtain an average of 12 subjects per day. Every second postpartum woman who met the criteria was picked from the sampling frame and if she was ineligible to participate in the study or declined to consent, the next one was requested until the minimum desirable sample size was reached. Data was collected everyday for sampled postpartum patients. Since my sample size was 320, and each day there was a minimum of about 35 deliveries, a study subject was recruited after every 2 women in the post-delivery book to form a sample. Every second interval was arrived by considering an average of at least 35 deliveries on a daily basis with an average number of 12 subjects to be interviewed daily. The study duration was 5 weeks, from 17th October to 21st November 2019.

2.8 Training of research assistants and Pretesting of the questionnaire

One research assistant, a nurse, was informed about the study and trained on data collection procedure. A pilot survey and pretesting of the questionnaire was conducted at the study area prior to data collection. Few changes were made by removing and shortening some questions. The survey was done for 2 days prior to data collection. Sixteen women were enrolled in the pilot study but were not included in the study sample.

2.9 Data collection

2.9.1 Data collection tool

The data collection tool was adopted from a study done in Cameroon.(9) It was modified by shortening lengthy questions, removing some parts such as newborn and labour phase assessment. A part of first visit antenatal care components assessment was added. The questionnaire was then translated to Swahili version which was used in data collection. It contained 3 main parts:

1st part: Contained socio-demographic and obstetric characteristics including; Age, parity, marital status, residence, employment status, level of education, number of ANC visits, gestational age and mode of delivery.

2nd part: Contained components of ANC services provided in the first visit including history taking (Parity, number of living children, gestational age-LNMP, information about previous pregnancies), physical examination (Fundal height), clinical investigations (blood pressure, body weight), Laboratory investigations(hemoglobin level, grouping and Rhesus factor, VDRL, HIV, urine for protein), supplements (iron tablets) and client education and counseling.

3rd part: Contained pregnancy outcomes including; Anemia in pregnancy, Gestation diabetes, hypertensive disorders in pregnancy, cesarean delivery, Spontaneous vertex delivery, obstetric hemorrhage, low Apgar score, low birth weight, preterm delivery, perinatal deaths and others.

2.9.2 Data collection procedures

Data collection was done by the principle investigator and 1 research assistant .Participants enrolment was done by both the principal investigator and the assistant from the post delivery record book in the labour ward. Data was gathered by interviewing post delivery mothers and was validated from antenatal cards of postpartum women. The interview was conducted in the postnatal wards.

2.10 Definition and Coding of variables

Variables analyzed were all components of socio-demographic and obstetric characteristics such as (Age, parity, marital status, residence, employment status, level of education, number of ANC visits, gestational age and mode of delivery), antenatal care services offered in the first visit (history of participants, blood pressure, body weight, fundal height, hemoglobin level, grouping and Rhesus factor, VDRL, HIV, urine for protein, hemoglobin level, grouping and Rhesus factor, VDRL, HIV, urine for protein, iron tablets and client education and counseling) and pregnancy outcomes such as (Anemia in pregnancy, Gestation diabetes, hypertensive disorders in pregnancy, cesarean delivery, Spontaneous vertex delivery, obstetric hemorrhage, low Apgar score, low birth weight, preterm delivery,

perinatal deaths). The dependent or outcome variable was pregnancy outcomes and the independent variables were antenatal care booking (early booking or late booking), social demographic and obstetric characteristics. Coding of variables was decided by the principal investigator during data entry.

2.11 Data management and analysis

Raw data on socio-demographic characteristics, time of booking, provision of ANC services and pregnancy outcomes were coded, entered, cleaned and analyzed using Statistical Package for Social Sciences (SPSS) version 23.0. Statistical analysis using descriptive statistics was used to determine the proportion of women with early ANC booking, to compare the provision of first visit antenatal care services to women with early and late ANC booking according to FANC and to determine the association between early booking and the various pregnancy outcomes. Cross-tabulation was used to compare the frequencies of various pregnancy outcomes within the two categories of women with early and late ANC booking. Chi-square was used to determine the association between the dependent and independent variables. Those with P-value of <0.05 were considered statistically significant. Results were summarized using frequency distribution tables, figures and texts.

2.12 Ethical considerations

The ethical clearance was obtained from Muhimbili University of Health and Allied Sciences (MUHAS) Senate Research and Publication Committee. Permission to conduct the study was obtained from Sinza Hospital through Head of Department of Obstetrics and Gynecology. The participant's information was kept confidential. Voluntary, written informed consent to participate in the study was sought from potential study participants after being informed on the purpose of the study, what is going to be done and the benefits obtained from the study findings. Participants had all the rights to withdraw from the study any time they would have wished. The confidentiality and anonymity was assured and maintained whereby no name of the patient appeared on the checklist or data set in SPSS. Codes were used instead of names. Data collected was properly kept. Those who had adverse pregnancy outcomes were counseled and advised on preconception care and early booking.

3.0 RESULTS

Over the 5 weeks period (from 17th October to 21st November 2019), there were 761 deliveries by vaginal, assisted vaginal and caesarian section. A total of 320 postpartum women were recruited after fulfilling the inclusion criteria and consenting. There were no participants who declined and no any poorly filled questionnaire that was discarded. The total number of study participants was therefore 320. The proportion of women who made early booking were 105(32.8%)

Figure 2: Client Flow Chart

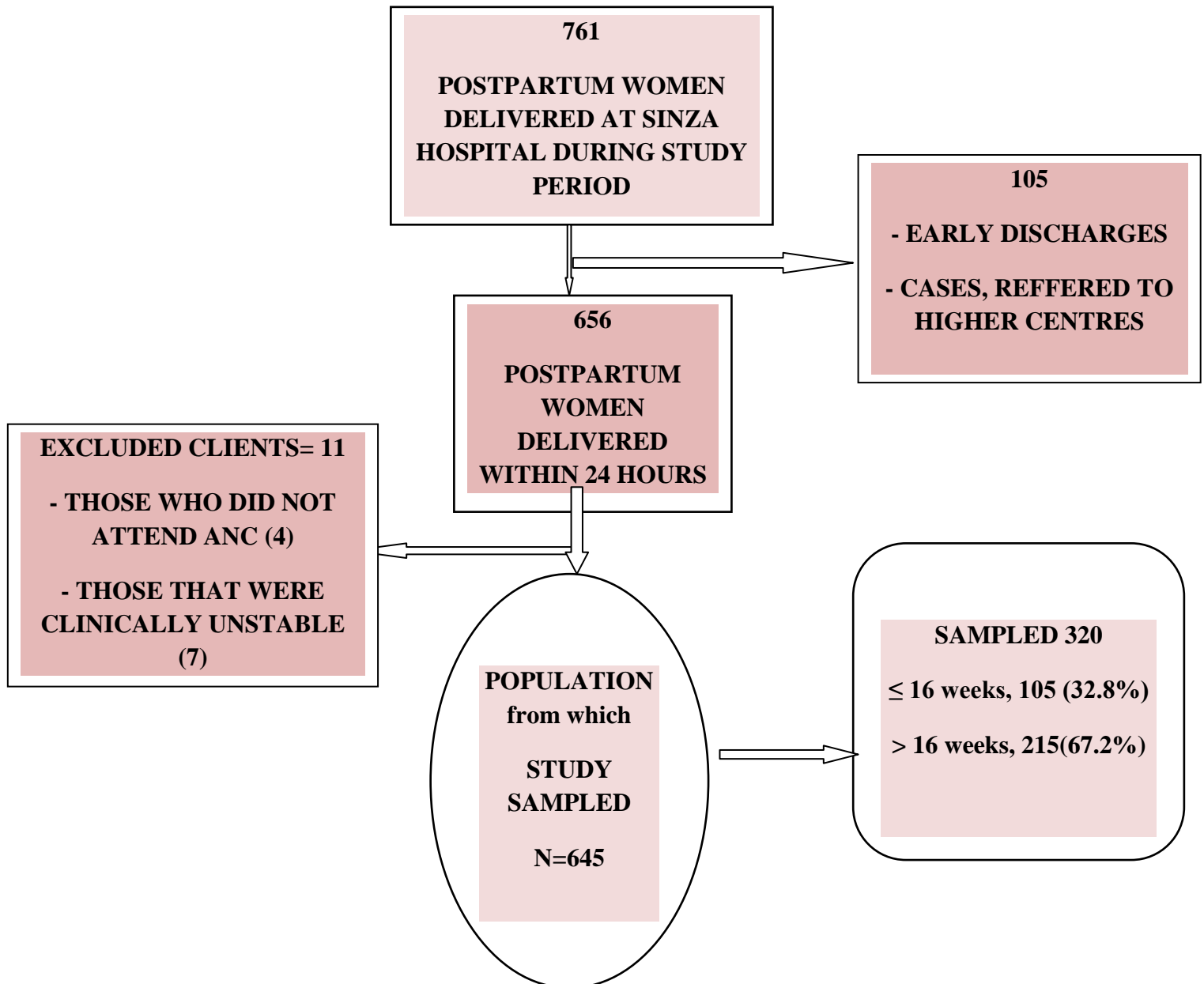


Table 1: Sociodemographic and Obstetric Characteristics of Women with Early and Late ANC Booking, N=320

Variables	Late booking n=215(%)	Early booking n=105(%)	P-value
Age groups			
<20	16(7.4)	13(12.4)	0.013
20-35	173(80.5)	89(84.8)	
>35	26(12.1)	3(2.9)	
Marital status			
Married	174(80.9)	95(90.5)	0.028
Single	41 (19.1)	10(9.5)	
Employment status			
Employed	86(40.0)	49(46.7)	0.080
Unemployed	96(44.7)	49(46.7)	
Self employed	33(15.3)	7(6.6)	
Level of education			
Primary	94(43.7)	48(45.7)	0.451
Secondary/ Higher education	116(54.0)	57(54.3)	
No education	5(2.3)	0(0.0)	
Parity			
1-4	80(37.2)	55(52.38)	0.010
>4	135(62.8)	50(47.62)	
Gestation Age at delivery			
28-36	40(18.6)	7(6.7)	0.031
> 36	175(81.4)	98(93.3)	
Number of visits			
<4	62(28.8)	4(3.8)	0.000
≥4	153(71.2)	101(96.2)	

Most (173, 80.5%) of the participants were aged between 20-35years. Majority of them 174(80.9%) who booked late and 95(90.5%) who booked early were married. About third of early 49(46.7%) and late bookers 86(40.0%) were employed. Only few, 5(2.3%) of those who booked late had no formal education. Majority (37.2%) of late bookers and (52.38) of late bookers had parity between one and four, with most of them having more than four ANC visits. There is statistical significant association between most sociodemographic and obstetrical characteristics with timing of initiation of ANC such as age (p value= 0.013), marital status (p value =0.028), parity (p value=0.010), gestation age at delivery (p value= 0.031) and number of visits (p value=0.000).

Table 2: Provision Of First Visit ANC Services in Women with Early and Late ANC Booking, N=320

VARIABLE	Late Booking n=215 (%)	Early Booking n=105(%)	P-value
History of participants			
Yes	201(93.5)	105(100.0)	0.007
No	14(6.5)	0(0.0)	
Blood pressure of client			
Yes	209(97.2)	99(94.3)	0.196
No	6(2.8)	6(5.7)	
Weight of participant			
Yes	206(95.8)	102(97.1)	0.557
No	9(4.2)	3(2.9)	
Fundal height of client			
Yes	202(94.0)	97(92.4)	0.594
No	13(6.0)	8(7.6)	
Hemoglobin level			
Yes	174(80.9)	104(99.1)	0.000
No	41(19.1)	1(0.9)	
Blood grouping and Rh			
Yes	182(84.7)	104(99.1)	0.000
No	33(15.3)	1(0.9)	
VDRL test			
Yes	200(93.0)	102(97.1)	0.133
No	15(7.0)	3(2.9)	
HIV test			
Yes	182(84.7)	105(100.0)	0.000
No	33(15.3)	0(0.0)	

Urine protein & glucose			
Yes	111(51.6)	42(40.0)	0.051
No	104(48.4)	63(60.0)	
Iron tablets			
Yes	183(85.1)	103(98.1)	0.000
No	32(14.9)	2(1.9)	
client education & counselling			
Yes	201(93.5)	104(99.1)	0.027
No	14(6.5)	1(0.9)	

There is significant association shown between time of booking and provision of some ANC services such as history taking, Hemoglobin level check, Blood grouping and rhesus, HIV testing, Iron supplements and client education and counselling all with p values less than 0.05. The ANC services offered to most clients who booked early and late respectively were history of the participants(100%, 93.5%), HIV test (100% ,84.7%), hemoglobin test (99.1%,80.9%), blood Grouping test (99.1%,84.7%),iron supplements (98.1%,85.1%) and client counseling (91.1%,93.5%).

Table 3: Pregnancy Outcomes of Women with Early and Late ANC Booking, N= 320

Variables	Late booking n=215 (%)	Early booking n=105 (%)	p-value
MATERNAL OUTCOME			
Anemia in pregnancy			
Yes	72(33.5)	34(32.4)	0.516
No	143(66.5)	71(67.6)	
Maternal death			
Yes	0(0.0)	0(0.0)	
No	215(100.0)	105(100.0)	
HTN disorders in pregnancy			
Yes	21(9.8)	6(5.7)	0.221
No	194(90.2)	99(94.3)	
Gestational Diabetes			
Yes	5(2.3)	0(0.0)	0.115
No	210(97.7)	105(100.0)	
Caesarean delivery			
Yes	62(28.8)	31(29.5)	0.899
No	153(71.2)	74(70.5)	
Spontaneous vertex delivery			
Yes	144(67.0)	70(66.7)	0.956
No	71(33.0)	35(33.3)	
FETAL/NEONATAL OUTCOME			
Low Apgar score			
Yes	7(3.3)	3(2.9)	0.847
No	208(96.7)	102(97.1)	
Low birth weight			
Yes	11(5.1)	5(4.8)	0.891
No	204(94.9)	100(95.2)	
Preterm delivery			
Yes	40(18.6)	7(6.7)	0.065
No	175(81.4)	98(93.3)	
Perinatal Deaths			
Yes	12(5.6)	1(0.9)	0.049
No	203(94.4)	104(99.1)	
OTHER OUTCOMES			
Macrosomia	8(61.5)	5(34.5)	0.736
Assisted breech delivery	5(75.0)	1(25.0)	
Low cavity vacuum extraction	7(100.0)	0(0.0)?	
Congenital malformation	1(100.0)	0(0.0)?	
Ruptured uterus	2(66.7)	1(33.3)	
Subtotal hysterectomy	1(100.0)	0(0.0)?	

One outcome, perinatal deaths (p-value 0.049) showed a significant association with time of ANC booking, with a p value < 0.05. All adverse pregnancy outcomes were more in the group that had late ANC booking as compared to those who had early booking. Maternal death as an outcome was not recorded in either of the groups.

5.0 DISCUSSION

Timely and adequate antenatal care is a corner stone for preventing complications during pregnancy. The prevalence of early ANC booking among women delivered at Sinza was about 32.8% .This is almost similar to the findings which were observed in a hospital based study done in Ethiopia with similar methodological approach whereby 40.2 % of the women booked for ANC during first trimester(27). Slight higher prevalence was observed in another hospital based cross-sectional study done in Ethiopia where nearly half of the respondents booked for ANC during first trimester(14). In contrast lower prevalence was reported in Zambia and in Cameroon where only 19% and 20.5% of women booked for ANC during first trimester respectively, and even lower prevalence was reported in Nigeria in 2008 (7.6%),Uganda in 2007 (16%) and Malawi in 2010 (9.0%).This study has shown an increase in early initiation of ANC services among pregnant women from 24% according to Tanzania Demographic and health Survey 2015 to 32.8% as shown from this study, though there are missed opportunities for early intervention as more than 50% of women seek their ANC services beyond the first trimester of pregnancy and few who did not seek ANC services at all.

A higher ANC coverage was obtained for women who attended at least one visit in this study. This is higher than the national ANC coverage in Tanzania obtained in 2015 where 90% attended at least one ANC visit. The ANC attendance rate in our study was almost similar to that obtained in the Buea Health District in Cameroon (96%) in 2016. Also about 79.4% of women attended at least four visits indicating that 79.4% of women had adequate ANC visits which is higher to the findings of a study that was done in Tanzania where only 51% of pregnant women had adequate ANC visits(15). This shows an increase from 51% to 79.4%.It has also shown some improvement as compared to the global 2014 data from WHO, where 64% of pregnant women attended the WHO recommended minimum four contacts for ANC. This indicates that there is a general high ANC attendance rate .Furthermore, the ANC attendance rate in our study was quite similar to that obtained in other countries in Sub-Saharan Africa (SSA) such as Equitorial Guinea and Kenya. However, this does not clear the doubts that much more work needs to be done to address ANC utilization and quality.

Overall, the study results suggest that total ANC attendance at Sinza hospital is not adequate with 32.8% of these women initiating ANC early. However, this still calls for population health education amongst women of childbearing age emphasizing the need for continuous follow-up during pregnancy and early booking for ANC.

The study has also compared the provision of ANC services of the first visit in those who booked early and those who booked late. Significant association has been shown in most of the first visit ANC services, meaning delivery of those specific services are associated with time of ANC booking. Antenatal care services were offered to most clients who booked early. These include: History taking, hemoglobin level, blood grouping and rhesus, HIV testing, Iron and supplements and client counselling. This study has revealed the importance of commencing ANC early, as most of the components of ANC profile were delivered more in those who booked early as compared to those who did not. Similar findings were shown in a study in UK which showed that pregnancy care was associated with early booking(28).

Pregnancy outcomes assessed include both maternal and fetal. Maternal pregnancy outcomes were: Anaemia in pregnancy, obstetric hemorrhage, Gestational diabetes, hypertensive disorders in pregnancy, caesarean delivery, spontaneous delivery and maternal death. Fetal outcomes were: preterm delivery, low Apgar score, low birth weight and perinatal deaths. Other pregnancy outcomes were: assisted breech delivery, low cavity vacuum extraction, repaired ruptured uterus, subtotal hysterectomy, macrosomia and congenital anomalies. There was no statistically significant difference in the pregnancy outcomes between women who booked early and those who booked late except for perinatal deaths (p value 0.049). Therefore in this study, most of the pregnancy outcomes assessed were not associated with time of booking of ANC. Studies carried out elsewhere have shown varied results. A similar study conducted in Nigeria and in Cameroon suggested that as a single component, early booking for ANC was a poor predictor of delivery and pregnancy outcomes(9,29). These findings were similar to this current study. In contrast, a study in the UK showed that pregnancy care was associated with early booking, good glycemic control in early pregnancy and reduced adverse outcomes like:

spontaneous abortions, malformations, perinatal death and premature delivery(28). Furthermore, other authors have advocated for the success of the early ANC booking in the diagnosis of early congenital malformations, control of anaemia, and prevention of malaria complications.

Also, recommendations and guidelines on the Optimal ANC Package suggested its use for screening against malaria, anaemia, HIV and diabetes, screening three major risks during delivery: uterine scar, breech presentation and premature rupture of membranes and finally warning the pregnant woman on danger signs during delivery. These factors were expected to improve pregnancy and delivery outcomes. Nonetheless, using this component of the Optimal ANC Package alone as shown in this study and others may not be an adequate predictor of adverse pregnancy outcomes especially in suburban populations. Therefore more research is needed to establish the benefits of commencing ANC as early as the first trimester and the other components of the Optimal ANC Package as a combination, on pregnancy outcomes. Even though early ANC commencement was not shown to influence late pregnancy outcomes in this study, further studies are needed to establish the benefits of this component of the Optimal ANC Package on early pregnancy outcomes in this suburban population.

However, the outcomes were slightly higher in the group that booked late unlike in that which booked early. The complications that were observed more in both groups include: prematurity, obstetric hemorrhage and hypertensive disorders, similar to findings of a study done in India with the aim of determining the complications of late antenatal booking which showed that the most reported maternal complications were anemia, hypertension and abruption placenta while fetal complications were in the form of prematurity and intrauterine fetal death(19). Also, similar findings were reported in a study done in Durban, South Africa in the department of Community health studies, in which maternal anemia occurred in more than half of the women studied.(20)

Despite the reported results, this study had one major limitation which is recall bias. This was mitigated by getting information from the patients' records (ANC cards, patients' files, and case notes)

5.0 CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

The proportion of women who booked early for ANC in this study was low; however it has increased in comparison to data from previous years. The proportion of women who booked early for ANC in this study was low; however it has increased in comparison to data from previous years. Early booking was associated with comprehensive and better provision of first visit ANC package. Late ANC booking was associated with more perinatal deaths compared to early booking.

5.2 Recommendations

Overall, the study results suggest that first trimester ANC attendance at Sinza is low. This calls for actions that will motivate the population to follow the ANC guidelines. Population health education amongst women of childbearing age should be strengthened emphasizing the need for continuous follow-up during pregnancy and early booking for ANC. Even though ANC attendance in the first trimester was not shown to influence late pregnancy outcomes in this study, further studies are needed to establish the benefits of this component of the Optimal ANC Package on early pregnancy outcomes. The study did not therefore assess the early pregnancy outcomes in women in Sinza Hospital. Further studies are therefore necessary to assess the effects of first trimester ANC especially concerning crucial factors like the risk of abortions in the first and second trimesters of pregnancy.

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APPENDICES

CONSENT FORM: ENGLISH VERSION

CONSENT FORM: SWAHILI VERSION

QUESTIONNAIRE

DODOSO

ETHICAL CLEARANCE

RESEARCH PERMITT