LATE INITIATION OF ANTENATAL CARE AND ASSOCIATED FACTORS AMONG PREGNANT WOMEN ATTENDING ANTENATAL CLINIC IN ALETA CHUKO DISTRICT, SNNPR

BY WOGI ERANE (B.Sc.)

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ADVISORS:

1. LEMESA DUBE (Assistant Professor)
2. AYANTU KEBEDE (B.Sc., MPHE)

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Abstract

Background: Late initiation of ANC is a visiting of pregnant women to health facility after 16 weeks of gestational age for first time according to Ethiopian ministry of health context. It is related with poor outcomes of pregnancy as many studies revealed.

Objective: To determine the magnitude of late initiation of antenatal care and associated factors among antenatal care attendees in Aleta Chuko district, Sidama Zone, SNNP, 2017.

Method: A facility based cross-sectional study employed to collect data from pregnant women using face-to-face interview. Study population was pregnant women in selected health facility and sample size was 484. Six health centers and one primary hospital included. Descriptive statistics, Bivariate and multivariate binary logistic regression analysis employed for data analysis and tables, figures and bar graphs used to present data.

Result: Sixty-five and seven percent pregnant women initiated their first ANC late. Pregnant women who had no formal education were 10.8 times late to initiate first ANC from secondary and above educational level, housewives were 3 times late to initiate first ANC than government employee, merchant and private business, pregnant women with gravidity two and above were 5 times late to initiate first ANC from gravidity one, those who had no history of abortion 3 times late to initiate first ANC from having abortion history and those who had low knowledge were 17 times late to initiate first ANC from high knowledge on ANC service.

Conclusion and Recommendation: The magnitude of late initiation of ANC was found high and the possible factors for this were no formal education, being housewife, gravidity two and above , no history of abortion and low knowledge on ANC service. Aleta Chuko health bureau should mobilize health care provider and community to improve this problem, addressing the identified factors by community mobilization and promoting the importance of early starting for ANC are necessary.

Key words are antenatal care, late initiation, pregnant women and Aleta chuko district.

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Lists of Abbreviations

ANC: Ante Natal Care

EDHS: Ethiopian Demographic Health Survey

FANC: focused antenatal care

HEW: Health Extension Worker

HC: Health Center

MMR: Maternal Mortality Ratio

SD: Standard Deviation

SNNPR: Southern Nations, Nationalities and people region

TDHS: Tanzanian Demographic Health survey

UI: Uncertainty Interval

WHO: World Health Organization

Chapter One: Introduction

1.1. Background

For a variety of logistic and cultural reasons in resource limited countries, the first time a woman attends a health facility during pregnancy may be because of a medical problem or because she is in labor. That means pregnant women are medically at high risk of morbidity and mortality. Antenatal care in such settings tends to be opportunistic and the ways in which care is delivered must be optimized to ensure that comprehensive care reaches as many pregnant women and girls as possible (1).

Antenatal care is the routine health control of presumed healthy pregnant women without symptoms (screening), in order to diagnose diseases or complicating obstetrics conditions without symptoms, and to provide information about lifestyle, pregnancy and delivery. The primary aim of ANC is to promote and protect the health of women and their unborn babies during pregnancy to achieve at the end of a pregnancy a HEALTHY WOMAN and a HEALTHY BABY. In the year 2001, the WHO issued guidance on a new model of ANC called goal-oriented or focused ANC, for implementation in developing countries. Within this new strategy, WHO recommends four antenatal care visits in low risk pregnancies and prescribes the evidence-based content for each visit. The first visit is during first trimester; the second, close to week 26; the third around week 32; and the fourth and final visit between weeks 36 and 38 (2).

Late ANC initiation is visiting of pregnant women to health facilities after 16 weeks of gestational age of pregnancy according to Ethiopian ministry of health. Different activities conducted in each visits according to WHO recommendations. For example determining the woman's medical and obstetric history in order to collect evidence of her eligibility to follow the basic component of FANC, or determine if she needs special care and/or referral to a higher health facility. Perform basic examinations (pulse rate, blood pressure, respiration rate, temperature, pallor, etc.). In contrast, if pregnant women are late for initiation of ANC follow-up, she is going to miss many interventions in ANC follow-up listed above and will be vulnerable to different pregnancy morbidities like infections, anemia etc (3)

Some studies reveal that late initiation to ANC follow-up has unfavorable consequences on pregnancy outcome. Unfavorable and poor pregnancy outcomes divided into maternal and fetal pregnancy outcomes. Maternal pregnancy outcomes included weight gain during pregnancy,

preterm delivery, caesarean delivery, prolonged labor and post-partum hemorrhage. Fetal pregnancy outcomes included fetal distress, neonatal asphyxia, and respiratory distress, low birth weight (LBW) and high birth weight (HBW). Other pregnancy outcomes assessed were malaria and anemia in pregnancy (4).

1.2. Statement of Problem:

Attending an antenatal clinic early in pregnancy is important: First, if pregnant women attend the clinics in the first three months of their pregnancy, health professional can detect HIV early and they can begin treatment. This makes it less likely, that their babies will contract HIV. It also helps to support their own immune systems, which decreases the chance for infections before or after birth. Second, early attendance allows health professionals to treat and manage other treatable health conditions that the woman-to-be may develop. These include high blood pressure and anemia, which are also major risk factors for maternal deaths. (5)

Late antenatal care is defined differently for different countries. For example, European countries health report defined late antenatal care as visiting of pregnant women to health facility for first time after first trimester. In Pakistan, late antenatal care initiation is defined as visiting of pregnant women to health facilities for first time after 24 weeks of gestation. In Ethiopia, late antenatal care initiation is a visiting of pregnant women to health facility after 16 weeks of gestation age for first time (3, 6 and 7).

Late antenatal care initiation magnitude is different for countries. It was 2% for Poland as minimum among European countries and the largest one was 33% for Malta, out of all pregnant women who attended antenatal clinic. In Pakistan, late antenatal care was 71 % according to one study conducted in country (6, 7). According to EDHS 2014, Eighty two percent of women made their first ANC visit after the 16 weeks of gestational age in Ethiopia (8).

Although there has been little evaluation of optimal timing of the initiation of antenatal care, pregnant women who receive late or no antenatal care are more likely to have poor or unfavorable and negative consequences on overall prenatal outcome (4, 9).

Late initiation of antenatal care is a significant risk factor for maternal mortality in some studies. Timely Antenatal visits can provide opportunities for detecting risk factors for eclampsia, and other underlying illnesses, which are direct causes for maternal mortality (10-12).

Pregnant women who initiate antenatal care late also suffered from medical complications like anemia, hypertension, Diabetes and intrauterine fetal death in Pakistan according to one study. It can leads to certain medical complications, which have a significant impact on feto maternal outcome (7).

The estimated maternal deaths was 303000 globally in 2015, yielding an overall MMR of 216 (UI 207 to 249) maternal deaths per 100 000 live births for the 183 countries. The overall MMR in developing regions is 239 (UI 229 to 275). Sub-Saharan Africa has a very high MMR with a point-estimate of 546 (UI 511 to 652) (13).

The maternal mortality ratio in Ethiopia was 676 deaths per 100,000 live births according to EDHS 2011. The 95% confidence interval for the 2011 maternal mortality ratio ranges from 541 to 810 deaths per 100,000 live births. The EDHS 2016 reported that maternal mortality ratio in Ethiopia was 412(8, 14).

WHO approved the strategies to reduce maternal mortality in 2015. Timely and quality Antenatal care was one among the strategies to apply for reduction of maternal mortality (15).

The predictors associated with late initiation of antenatal care were different from different studies like residence, education of pregnant woman, occupation of husband, parity and being planned, women who had no past obstetrical complications and those who lived far away from health care facilities etc(7, 12). Therefore, to reduce maternal mortality minimizing late antenatal care might be one means. Factors, which contribute to late antenatal care initiation, should also be known to minimize late antenatal care effectively.

1.3. **Significance of Study:**

The present study reported the factors that contributed for late initiation of ANC and provided more information for any intervening organization since limited study conducted to identify factors responsible for late ANC among women of Aleta chuko district. Additionally, the results of this study have positive contribution for policymaking, health care providers, educators and researchers, to improve or strengthen policies related to provision of ANC. The study would hopeful be used as base line information for concerned governmental bodies, nongovernmental organizations or health service providers to plan and act in motivating women to use to have ANC earlier and institutional delivery service so that maternal and infant mortality and morbidity shall be reduced. Moreover, we assumed that information obtained from this study will update

knowledge in the area of maternal and child health and the findings might help to enhance family and social support system for pregnant women in communities.

Chapter Two: Literature Reviews

2.1. Antenatal Cares

Good care during pregnancy is important for the health of the woman and the development of the unborn baby. Good ANC links the woman and her family with the formal health system, increases the chance of using a skilled attendant at birth and contributes to good health through the life cycle. Inadequate care during this time breaks a critical link in the continuum of care, and affects both women and babies: For many of the essential interventions in ANC, it is crucial to have early identification of underlying conditions: for example, prevention of congenital syphilis, control of anemia, and prevention of malaria complications. Hence, the first ANC visit should be as early as possible in pregnancy, preferably in the first trimester (4).

2.2 Late Initiation of ANC

A study conducted in Myanmar on the magnitude of late antenatal care booking among women indicated the prevalence of late ANC attendance was as high as 56.2 % and there is difference within a residence (12). Another study conducted in china revealed only 35.2% had their initial visit in the first trimester. Only 9.0% whose first antenatal visit took place during the first trimester had at least five antenatal visits (15). Another study in Durban, South Africa indicated that Two percent (n=7) of adolescent participants did not book for ANC at all prior to birth; these participants are often referred to as non-clinic cases (NCC's). It was alarming to note that 134 (43%) under-utilized ANC services by only attending between 0-3 visits. The majority of clients booked for ANC services late. Only 46% of clients engaged in early service utilization (14). Another study in Tanzania revealed that only 29% initiated ANC attendance within the first four months of pregnancy as recommended by WHO and overall pregnant women made their first ANC visit at a mean of 5.1 months (SD = 1.2, range = 2-9). Adolescent pregnant women started slightly earlier with a mean of 5.0 months (SD = 1.2, range = 2-8). It is noteworthy that the 13 multiparous adolescents in the sample initiated ANC attendance considerably later with an average of 5.5 (SD = 1.20, t = 1.43; p = 0.157) gestational months (16).

According to EDHS 2014 report, the coverage of antenatal care improved compared to the 2011 EDHS where 34 percent received antenatal care from a skilled provider. Eighteen percent of women made their first ANC visit before the fourth month of pregnancy, a three-fold increase from 6 percent in the 2000 EDHS (8). According to EDHS 2016, antenatal coverage increased to sixty-two percent but there is data mentioned about timing of first initiation of antenatal

care(15). A facility based cross sectional study conducted in kambata Tambaro zone, SNNP, Ethiopia, shows that the proportion of respondents who made their first ANC within the recommended time (before or at 16 weeks of gestation) is 123 (31.4 %) while those who booked late (after 16 weeks of gestation) were 269 (68.6%). The timing of first ANC booking ranges from first to 9^{th} months of gestation. The mean timing was 5.5±1.8 (17).

2.3. **Factors Associated With Late Initiation of ANC**

2.3.1 Socio-Demographic Factors:

A study conducted in Australia revealed that 41% of women commenced ANC after 12 weeks of gestation. Inequality existed between groups of women with predisposing characteristics and enabling resources contributed more to the variation in pregnancy duration at entry to ANC than needs. The groups of women with highest risk were teenagers, migrants from developing countries, women living in Western Sydney, Aboriginal and Torres Strait Islanders. The high-risk groups with largest number of women were migrants from developing countries and women living in Western Sydney (18). A cross sectional study conducted in Myanmar revealed that prevalence of late initiation of ANC was 56.2% (95% CI: 50.6%, 61.6%). Univariate analysis revealed that residence; education and occupation of pregnant woman, husband's occupation were significantly related to late initiation of ANC (12).

Another study conducted in southwestern Nigeria revealed that mean gestational age at booking was 20.3 weeks and Prevalence of late entry to antenatal care was 82.6%. Maternal education and age remained significant factors influencing late booking and a study in the same country revealed that there is a significant association between a marital status and religion of respondents under study and their attendance/utilization of ANC services (19- 20).

The study conducted on the timing and factors associated with first antenatal care booking among pregnant women in Adigrat town, Tigray, Ethiopia, revealed that the prevalence of late ANC was 51.8% and perception on the time to book ANC was the one among predictors. Another study conducted in Gondar Town; North West Ethiopia, showed that pregnant women aged 25 and below were nearly two times more likely to commence ANC within the recommended time compared to their counter parts. Likewise women whose age at marriage above twenty years were two times more likely to start their ANC within the first three months of pregnancy than those who married during their teens (21-22).

One study conducted in Arba minch city revealed that the factors that were associated with late ANC attendance were low monthly income, receiving advice on when to start ANC visits, household food insecurity, and unplanned pregnancy. The odds of pregnant women with low household monthly income to delay ANC booking were 5 times (AOR = 4.9, CI: 1.713, 14.076) higher compared to their counterparts with high monthly income (23).

In study conducted in Benin revealed that existence of barriers to reach ANC services has not associated with low utilization of ANC services (25). In Contrary, a cross-sectional study conducted in Cambodia revealed that geographical region showed a significantly negative association with access to full ANC (26). Another Study conducted in Kalabo District of Zambia on maternity services indicated that, distance is a significant factor affecting delay to decide to seek care from health facilities. It also influences the delay caused by the travel time from home to the clinic (29). Another study conducted in osuna state, Nigeria revealed that there is significant association between distance of health facilities under study and their attendance/utilization of ANC services (20).

2.3.2 Socio-Cultural Factors

One study conducted in Zambia revealed that the women whose partners had attained higher education level were two times more likely to attend four visits than those whose partners had no education (28). Another cross sectional study conducted in Debre Berhan health institutions, central Ethiopia revealed that 61.2% of respondents received advice as to when to start ANC visit for current pregnancy from husbands, close friends and other family members (29).

The study conducted in Arba minch city revealed that the factors that was associated with late ANC check-up was receiving advice on when to start ANC visits (23).

Paternal polygamy to many wives also reported to be a predictor for late ANC initiation according to study conducted in southwestern Nigeria (18).

Negative influence of lacking social and economic support on the timing of ANC initiation reported in study conducted in southeastern Tanzania. In particular not possessing money in cash when attending the ANC clinic ($p = 0.064$) and not receiving support from the husband/partner ($p = 0.035$) were independently associated with a later ANC enrolment in the multivariate analysis for all women. Women who had no money in hand attended on average about 1 week later and women who felt not supported by their husband attended almost 3 weeks later than women who did receive such support (16).

Final say on health care also has association with usage of ANC visit. Those pregnant women whom her health care affairs decided with others person were less likely to use ANC follow-up (AOR= 0.73, 95%CI, 0.54–0.99) than those pregnant women who decide on their own health affairs (26).

2.3.3. Pregnancy Related Factors

The finding of study conducted to ,assess factors associated with late initiation of antenatal care among pregnant women attending antenatal clinic at KembataTamabaro zone of Southern region, reported that among independent predictors, parity has significant association with late initiation of ANC. Of the total respondents of this study, 24.2% of respondents were parity zero, while the rest 75.8% were parity one and above. The study revealed that women who were parity one and above were more likely to register lately compared to those who have no parity (17). Another study conducted in Adigrat, Ethiopia revealed that the Pregnant women who had parity one and above were almost 3 times more likely to book late for ANC than woman with zero parity (21). In addition, other study Analysis showed that respondents with parity zero were 1.8 times more to book first Antenatal care timely as compared respondents those who had parity one and above (AOR=1.8, 95% CI, 1.1-2.8, $p<0.05$) (32). In contrary to this, another study showed that parity did not significantly influence gestational age at booking for ANC (32).

Results from the multivariate analysis showed that pregnant women who are parity one significantly and independently associated with early ANC visit. However, history of abortion and stillbirth, number of children alive, and means of approving pregnancy were not significantly associated with early ANC visit (29). Respondents with history of stillbirth know that time of booking is within 16 weeks of gestation, who had accompany to the health center were more likely to book ANC within the recommended time compared to others (AOR =15.1, 95% CI 1.29-175.8), (AOR= 3.54 95% CI 1.415-8.835) and (AOR= 4.198 95% CI, 1.18-14.94) respectively. However, those who do not have obstetric problem (AOR=0.050, 95% CI 0.11-0.228) and those who were booked timely for previous pregnancy preceding the current (AOR= 0.229, 95% CI 0.096-0.544) were less likely to book early within 16 weeks of gestation (35). Pregnant women who had no history on abortion were 71.1% times less likely to book late than pregnant women who had history on abortion (AOR=0.29; 95%CI, 0.137-0.607) (21).

A cross sectional study conducted in Adigrat, Ethiopia revealed that booking for ANC affected by type of pregnancy and perception on timing of ANC that they were statistically significant

with late booking for ANC in the multivariable binary logistic regression. Women with unplanned pregnancy were 16 times more likely to book late comparing to pregnant women with planned pregnancy (AOR=16.04; 95%CI, 3.445-74.639) (21). A cross sectional study conducted in Dilla health institutions support the above findings with unplanned pregnancy were significantly associated with the outcome variable; late ANC booking for first visit (30).

2.3. Conceptual Framework:

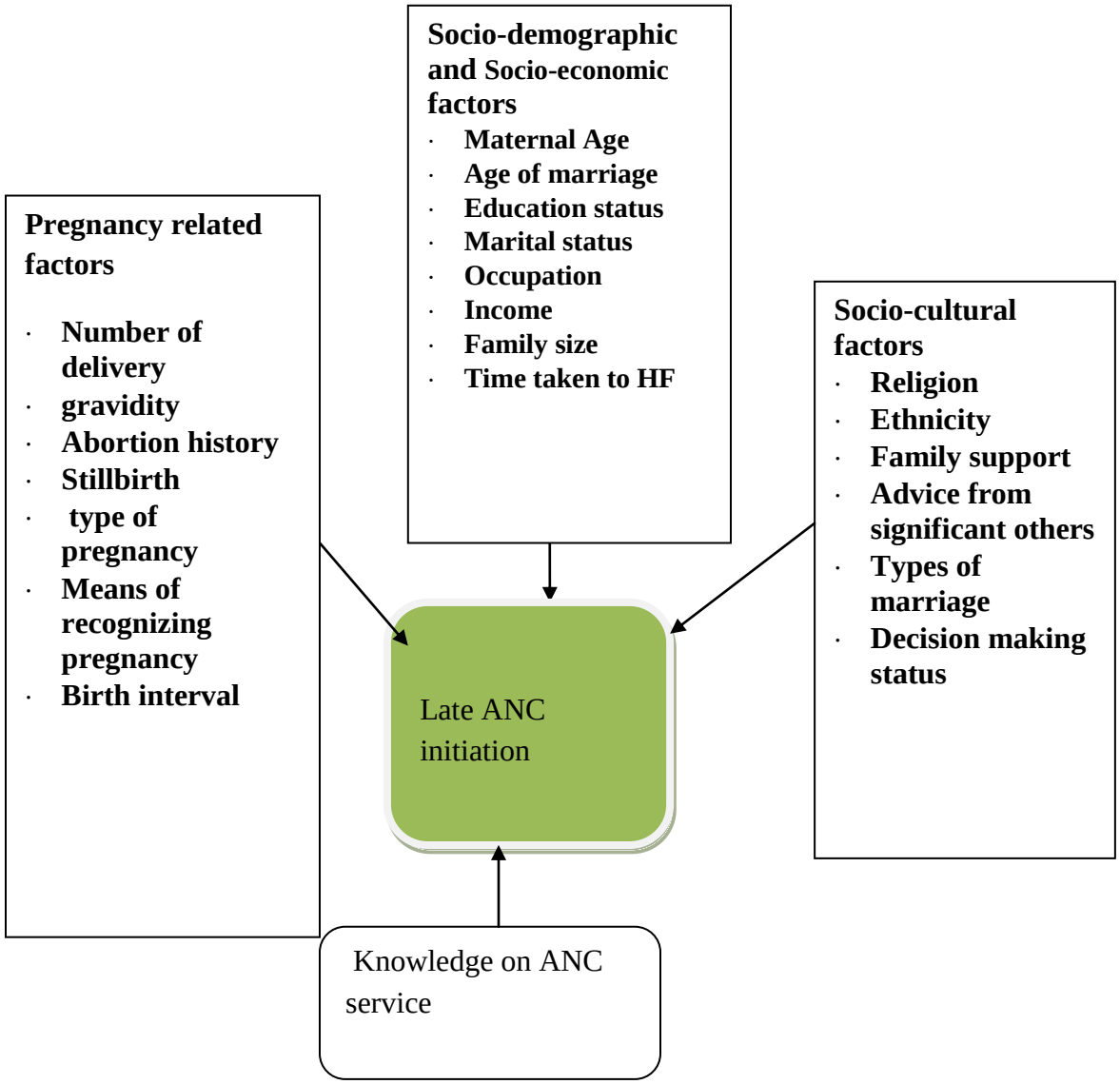

Figure 1: Conceptual framework developed from literature review

Chapter three: Objectives

3.1. General Objective

To determine the magnitude of late initiation of antenatal care and associated factors among pregnant women in selected Health institutions in Aleta Chuko district SNNP, 2017.

3.2. Specific Objectives

1. To determine the magnitude of late initiation of antenatal care among pregnant women in Aleta Chuko district, SNNPR health institutions, 2017.
2. To identify factors associated with late initiation of antenatal care among pregnant women in Aleta Chuko district, SNNPR health institutions, 2017.

Chapter Four: Materials and Methods

4.1. Study Area and Period

The study conducted in Aleta Chuko District, which is one of 23 districts in Sidama Zone, SNNP. The distance from Hawassa city is 60k.m and 333k.m from Addis Abeba. The district is composed of 26 rural kebeles and one town. Estimated population of Aleta Chuko District is 212098 and out of this 103291 are females. There are 26 health posts, 6 Public Health Centers, and 1 primary hospital in Aleta Chuko district. According to wereda health bureau, the ANC coverage is 45%. The study period was from February 20 up to April 10, 2017.

4.2. Study Design

A facility based cross-sectional study.

4.3. Source Population

All pregnant women who attend ANC at public health institutions in Aleta Chuko District

4.4. The Study Population

Pregnant women who attended ANC at chuko primary hospital and six health centers

4.5. Inclusion and Exclusion Criteria

4.5.1. Inclusion Criteria

Pregnant women who attended first ANC visits had been included.

4.5.2 Exclusion Criteria

Pregnant women who were incapable of interviewed due to not being healthy.

4.6. Sample Size Determination and Sampling Technique

The prevalence of receiving late ANC was 64.9% with 95% confidence level and 5% absolute precision (34). By using single proportion formula, it is as follows:

Sample size for first objective (n)$= \frac{\left(z_{\frac{\alpha}{2}}\right)^2 p(1-p)}{d^2}$

1. Sample for first objective is = 350

Where n= required sample size

Z= Critical value for normal distribution at 95% confidence level

which equals to 1.96

P=prevalence rate 64.9%

d= 0.05 (5% margin of error)

The Sample size calculated using Epi-info version7.0 statistical software for the second objective is as follows:

Table 1: sample size calculation for objective two

Predictors	CI %	Power (%) =1-β	α (%)	Ratio of exposed to unexposed	Proportion of outcome among unexposed (%)	AOR	Sample size=n
Got Information when to start at ANC	95	80	5	1	59.1	1.8	**440**
Having decision power on using current ANC	95	80	5	1	62.3	2.34	242
Means of pregnancy recognition	95	80	5	1	53.5	2.6	174

Adding 10% non-response rate give the required maximum sample size 484.

4.7. Sampling Procedure

There were 6 health centers, 26 health posts and 1 primary hospital. All health centers and one primary hospital were included. All pregnant women who had received first ANC at six health centers and one primary hospital had been included. We had excluded health posts because the provision of ANC service was not the same with health centers like it was not possible to determine pregnancy by urine test, some health posts have no coach for examination, etc.

We allocated the calculated sample size proportionally allocated to all six-health centers and primary hospital based on previous ANC follows up and had taken daily average client flow of the included health facilities from registry book of the selected facilities. The data was almost similar, which ranges from 3 to 4 clients per health centers, then this number is then multiplied

with monthly working days which is 22 days. The total sample size proportionally allocated for six- health centers and one primary hospital depending on the client flow in each health facilities using the formula below. The expected monthly client flow for included health institutions are as follows:

Table 2: proportionally allocated sample size

s.no	health institutions	Proportionally allocated client numbers
1	Loko hc	97
2	Gambela hc	97
3	Chuko pho	194
4	Miridicha hc	24
5	Dongora hc	24
6	Hallo hc	24
7	Rufo chanco hc	24
Total		484

$\boldsymbol{n_{hh1}=\frac{N_{hh1}}{N}\times n}$

$\boldsymbol{n_{hh1}}$ Is the sample size allocated to health centers hc

$\boldsymbol{N_{hh1}}$ Is the number of clients who visit the included health centers h and one primary hospital h1 in a year

N the cumulative number of clients who have visited all the three-health centers hc in a year

Where n the total sample size allocated to each health facilities.

h runs from 1 to 6. By above formula, the proportional allocated samples obtained:

$$\boldsymbol{n_{l0ko\ hc}=\frac{1056}{5280}\times 484=97}$$

$$\boldsymbol{n_{gambelahc}=\frac{1056}{5280}\times 484=97}$$

$$\boldsymbol{n_{ckukopho}=\frac{2112}{5280}\times 484\approx 194}$$

$$\boldsymbol{n_{miridichahc}=\frac{264}{5280}\times 484\ \approx 24}$$

$$n_{dongora\ hc}=\frac{264}{5280}\times 484\approx 24$$

$$n_{hallo} = \frac{264}{5280} \times 484 \approx 24$$

$$n_{rchanco} = \frac{264}{5280} \times 484 \approx 24$$

Many times Pregnant women were not attending antenatal care on their appointment days, if systematic random sampling is going to be done, there might be many non-response rate because of not being present on data collection day. Therefore, recruiting only first ANC visit consecutively without repeating until the required sample from each facility achieved is better to minimize non-response rate.

4.8. Variables of Study

Dependent variable:

The dependent variable is late ANC initiation.

Independent Variable:

Pregnancy related variables:

Number of delivery

Gravidity

Abortion history

Stillbirth

Type of pregnancy

Means of recognizing pregnancy

Birth interval

Socio-demographic and Socio-economic variables:

Maternal Age

Age of marriage

Education status

Marital status

Occupation

Income

Family size

Distance

Socio-cultural variables:

Religion

Ethnicity

Family support

Advice from significant others

Types of marriage

Decision making status

Knowledge on ANC service

4.9. Operational And Terms Definition

Early attendant: it refers to pregnant women who initiated of ANC check-up before or at the 16th week of gestation otherwise; it is late attendant (3).

Skilled provider: Persons with midwifery skills (physicians, health officers, nurses/midwives) who can manage normal deliveries and diagnose, manage or refer obstetric complications.

Significant others: people who could provide helpful or non-helpful information about ANC check-up.

Healthy pregnant women: are those pregnant women who are well meaning moving freely, oriented to time, place and person and being able to interview.

Family support: obtaining support from parents of husband or her parent or by her husband or other nearby person during pregnancy. It may be financial or sharing of work in home.

Far distance: is a distance pregnant woman walk to health facility about 60 minute or more otherwise, it is a **near distance** (17).

High knowledge: knowledge about ANC service a pregnant woman were asked like ANC definition, uses of ANC check-up, danger signs of pregnancy, ANC timing and recommended

number of ANC check-up in pregnancy and those who had scored greater than or equals to 70% otherwise low knowledge (36).

Very Low Monthly household income: if approximate monthly household income is below 400 Ethiopian birr, **medium if 401-1000,** otherwise**, high(17).**

4.10. Data Collection Procedure and Instrument:

We collected Data by face-to-face interview and measured gestational age at which the pregnant women visited first antenatal care with cent-meter and by asking last menstrual period. Fundal height or gestational age measured from sympasis pubis by cent meter. One cent-meter below umbilicus represents one week and above umbilicus, two weeks. We also, estimated gestational age by asking last menstrual period and confirmed the Pregnancy by urine tests when we were not sure about it. Late initiation of ANC defined as getting first ANC after 16 completed weeks of gestation (3). Socio-demographic characteristics of pregnant woman such as education, occupation and residence, time taken to health facilities, marital status, Age of pregnant woman, size of family and per capita household's income and obstetric characteristics such as gravidity, parity, stillbirth, the present pregnancy planned or not, etc asked.

Two health officers and Seven diploma holder nurses, who were not working in the health centers were participated in data collection after being given two days training on the data collection tools and collection procedures by the principal investigator. They had collected data by using structured and pre-tested questionnaire. First, pre-test of 5% sample size conducted and twelve of pregnant women showed that they afraid with some of questions like abortion status. Some of them had difficult of understanding the questions. Therefore, we tried to arrange placement of questions like abortion to put it end part of questionnaire to prevent discouragement towards interview. To solve difficult of understanding the questions, we discussed how to easily approach and make questions clear for them. The questionnaire first developed in English and then translated into Amharic then to Sidama language. Most of the items developed from existing literatures. The Sidama language questionnaires used to collect data at all the selected health facilities. The pretested questionnaire was not included in the study. Supervision was every data collection day at each health facility during the study period by the principal investigator and supervisors. The supervisors and principal investigators had carefully checked collected data for completeness as well as consistency and had handled any confusion on the data collection procedure timely.

4.11. Data Processing and Analysis:

We coded and entered Data into Epidata version3.1, and analyzed using SPSS, version 20. Descriptive statistics like table and pie charts were used to present data and frequencies and percentages were used to organize the categorical independent variables, and mean/standard deviation were used to describe a continuous variable. Frequency tables used to present descriptive results. For this study, bivariate logistic regression model fitted for candidate variables. Odds ratios (OR) was computed with the 95% confidence interval (CI) to see the ANC time of initiation in relation to the considered associated factors in this research. Independent factors, with a P-value <0.25 obtained in the bivariate logistic regression were entered into the multiple logistic regression models. Consequently, significantly associated factors identified using backward selection method. Then an adjusted odds ratio (AOR) with 95% confidence interval calculated for the significant predictive variables, and statistical significance accepted at (P< 0.05). A logistic regression table used to present the results.

4.12. Data Quality Assurance:

Pretesting of the 5% sample size conducted on pregnant women attending ANC at loko health center before the study period and appropriate modification applied. Training of two days were given for seven data collectors and two supervisors. The data that collected for pretest purpose was not included in the main study. All filled questionnaires checked for completeness, accuracy, and consistency. Necessary corrections and changes employed after data collection. The Principal Investigator and supervisors carried out all supervisions throughout the data collection period.

4.13. Ethical Considerations:

Ethical clearance and permission letter obtained from the institutional review board of Jimma University, institute of health. The health centers and primary hospital included in this study were asked permission using formal letters from the university, Aleta Chuko Administration Health Bureau and Oral and written informed consent were obtained from each study participants after the objectives of the study were explained. Participation of respondents strictly made on voluntary basis. The participants were informed that the information collected was anonymous; they could withdraw from the interview if they were unhappy during interview and only those who were willing interviewed. Confidentiality of responses maintained throughout the

research process. Personal privacy and cultural norms respected properly. No names used; however, the questionnaires were serial numbered for the purpose of data entry.

4.14. Result Dissemination Plan:

The result of this study will be submitted to Jimma University, institute of health, department of Epidemiology. We give two copies to the Aleta Chuko administration Health Bureau and Non Governmental Organizations working around maternal health in the district. Besides, there will be presentation of the research outputs to the college community and other concerned stakeholders. Manuscript will also be prepared and sent for publication to reputable journal.

Chapter Five: Result

5.1. Demographic and Socio-Economic Characteristics

The 475 pregnant women responded with a response rate of 98.1% and 9 questionnaires were dropped due to incompleteness. Majority of the study participants were Sidama (96.4%) by ethnicity, and protestant (97.3%) in religion. Of these 254(53.5%) of the pregnant women were in the age group of 15-24 years followed by 202(42.5%) in the age group of 25-34. From all the pregnant women 470 (98.9%) were married, 122(25.7%) were without formal education and 275(57.9%) attained primary school education and 186(39.2%) family income were less than 400 ETB. Out of all pregnant women 370(77.9%) were housewife (Table 3).

Table 3: Demographic and socio-economic characteristics of pregnant women at Aleta Chuko, 2017.

Variables, N=475	Number	Percent
Age		
15-24	254	53.5
25-34	202	42.5
35-49	19	4.0
Marital status		
Single	2	0.4
married and live together	470	98.9
Cohabitation	2	0.4
separated, widowed, divorced	1	0.2
Educational level of pregnant woman		
no formal education	122	25.7
primary school(1-8)	275	57.9
secondary and above	78	16.4
Occupation		
Housewife	370	77.9
government employee, merchant and self employed	105	22.1
Educational level of husband		
no formal education	43	9.1
primary school	274	57.7
secondary and above	158	33.3
Advice from significant others		
Yes	27	5.7
No	448	94.3

Monthly house hold income in Ethiopia birr		
<=400	186	39.2
401-1000	202	42.5
>1000	87	18.3
age during marriage		
<20	434	91.4
>=20	41	8.6
Residence		
Urban	84	17.7
rural	391	82.3
family size		
<=5	419	88.2
>5	56	11.8
Time taken to health facility		
<=60 min	440	92.6
>60 min	35	7.4

5.2. Timing of First ANC Visit

Magnitude of pregnant women who initiated their first ANC after 16 weeks of gestational age, were 312(65.7%) (figure 2). Among the pregnant women 158(33.3%) reported the reason for the specific time for first ANC visit that they do not know the right time and its purpose (Table 4). The mean time of first ANC visit of pregnant women was 18.9 ±5.4 weeks. The minimum and maximum time of first ANC visit of pregnant women was 4 and 34 weeks respectively.

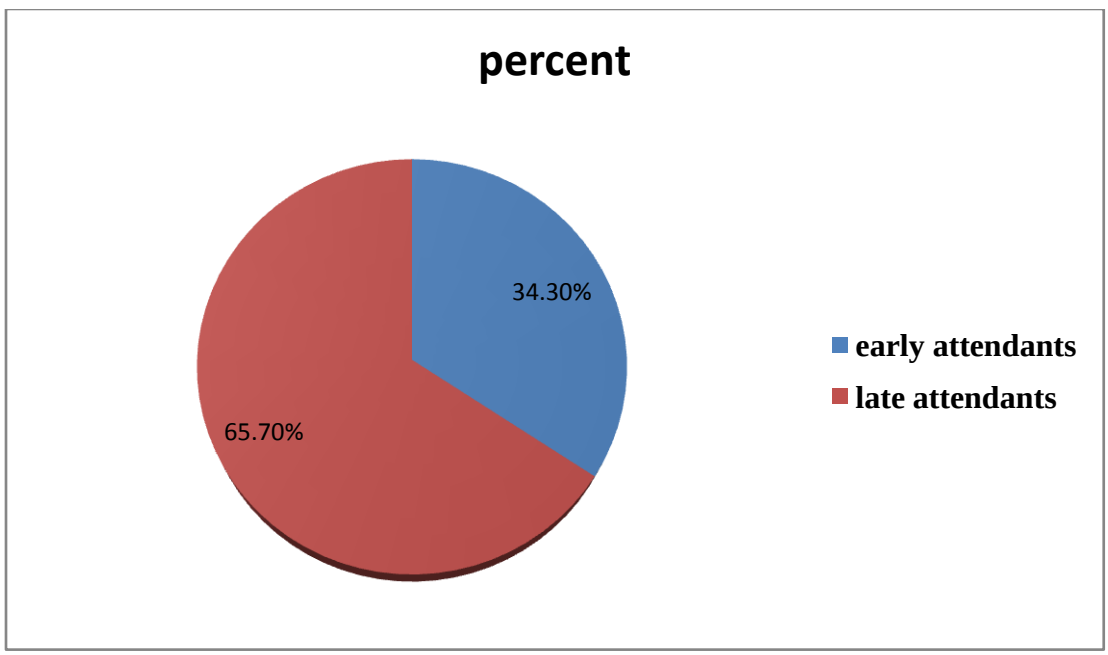

Figure 2: Classification of gestational age by which pregnant women visited to health facility first time, Aleta chuko, 2017

5.3 Obstetric History

One hundred eighty six (39.2%) of pregnant women were gravidity one, 447 (94.1%) pregnant women were with no history of abortion, 115(42.1%) with parity one, 227(83.2%) assisted by spontaneous vaginal delivery (table 4).

Table 4: Variables Related to obstetric history, Aleta chuko district, 2017.

Variables	Number	Percent
Number of pregnancy=475		
One	186	39.2
Two	124	26.1
three and above	165	34.7
History of abortion N=475		
Yes	28	5.9
No	447	94.1
Total number of abortion N=28		
Spontaneous abortion	24	85.7
induced abortion	4	14.3
Parity N=273		
Once	115	42.1
Twice	81	29.7
above two	77	28.2
History of still birth N=273		
Had history of still birth	20	7.3
Had no history of still birth	253	92.7
Method of delivery n=273		
Cesarean section	46	16.8
Spontaneous vaginal delivery	227	83.2
Any recent pregnancy related illness N=475		
Yes	141	29.7
No	334	70.3
Delivery place for last birth N=273		

Home	157	57.5
health facility	116	42.5
Birth interval N=273		
≤ 2 years	37	13.6
above two years	236	86.4
History of previous ANC N=273		
Yes	206	75.5
No	67	24.5
Pregnancy planned N =475		
Yes	432	90.9
No	43	9.1
Means to confirm pregnancy N=475		
missed period	293	61.7
urine test	182	38.3
Source of information for starting ANC N=475		
HEW	269	72.1
I heard from radio/television	3	.8
Husband	70	18.8
Mother	9	2.4
Sister	2	.5
Friend	19	5.1
others	1	.3
Reasons for the specific timing of first ANC initiation N=475		
my family advised me	123	25.9
from my previous experience	32	6.7
I don't know that I am pregnant	8	1.7
since it is unplanned pregnancy	3	.6
I don't know the right time	158	33.3

and its purpose		
perceived appropriate time	54	11.4
busy by other work	69	14.5
for seeking treatment for illness	19	4.0
since no illness	8	1.7
Others	1	.2

5.4. Knowledge of ANC Service

Out of 475 respondents, three hundred two (63.6%) responded that ANC is regular medical and nursing care recommended during pregnancy. 284 responded that it is to treat and prevent potential problems of pregnant women (table 10). Table 5 shows those pregnant women scored below 70% classified as low knowledge and those who score 70% and above classified as high knowledge. Out of 475 study participants, 416 (87.6%) study subjects had low knowledge about overall ANC care and the mean of score is 42.94 %(table 5).

Table 5: Score based on knowledge of ANC service:

Percentage of Score (%) N=475	
	Number or percent
Good (≥70%)	59(12.4%)
Poor (<70%)	416(87.6%)
Mean of score with 95%CI	42.94 %(41.1%-45.03%)

5.5. Socio-Demographic Factors Associated With Late Initiation Time for ANC

In the bivariate binary logistic regression analysis, the following socio-demographic variables have been found to be associated with late initiation for ANC check-up at p-value<0.25. Those variables were maternal age, maternal and husband educational status, maternal and husband occupation, family size and residence (Table 6).

Table 6: binary logistic regression result for socio-demographic and cultural factors of pregnant women, Aleta chuko district, 2017

Variables	Category	Outcome variable		COR	P-value
		Late attendants(1)	Early attendants(0)		
Maternal age	15-24	154(60.6%)	100(39.4%)	1	
	25-34	148(80.8%)	60(19.2%)	1.60(1.08-2.37)	.02
	35-49	10(77%)	3(23%)	2.17(.58-8.06)	.25
Marital status	Single, separated and cohabitation	4(80%)	1(20%)	2.1(0.23-18.98)	0.51
	Married and live together	308(65.5%)	162(34.5%)	1	
Residence	Urban	40(47.6%)	44(52.4%)	.39(.25-.64)	0.00
	Rural	272(69.6%)	119(30.4%)	1	
Age during marriage	<20	287(66.1%)	147(33.9%)	1.25(.65-2.41)	.51
	≥20	25(61%)	16(39%)	1	
Occupation	Housewife	266(71.9%)	104(28.1%)	3.28(2.1-5.13)	.000
	Government employee, merchant and self employed	46(43.8%)	59(56.2%)	1	
Educational status	No formal education	105(86.1%)	17(13.9%)	16.76(8.19-34.31)	.000
	Primary school(1-8)	186(67.6%)	89(32.4%)	5.67(3.24-9.94)	.000
	Secondary and above	21(26.9%)	57(73.1%)	1	
Time taken to health	<60 min	292(66.4%)	148(33.6%)	1	
	≥60 min	20(57.2%)	15(42.8%)	.676(.34-1.36)	.27

facility					
Family size	≤5	263(62.7%)	156(37.2%)	1	
	>5	49(87.5%)	7(12.5%)	4.15(1.84-9.39)	.001
Monthly house hold income in eth. Brr.	<400	151(72.6%)	57(27.4%)	1.32(.77-2.26)	.32
	401-1000	136(64%)	76(35.8%)	0.89(.53-1.52)	.69
	>1000	25(45.5%)	30(54.5%)	1	
Educational level of husband	No formal education	33(76.7%)	10(23.3%)	3.06(1.4-6.61)	.005
	Primary school	197(71.9%)	77(28.1%)	2.37(1.58-3.57)	.000
	Secondary and above	82(51.9%)	76(48.1%)	1	
Occupation of husband	government employee	12(44.5%)	15(55.5%)	1	
	Farmer	160(78.8%)	43(21.2%)	.63 (.23-1.66)	.35
	Merchant	117(57.3%)	87(42.6%)	2.9(1.44-5.88)	.00
	Private employee and self business	23(56%)	18(43.9%)	1.05 (.53-2.07)	.88

5.6. Pregnancy And Related Factors Associated With Late Initiation Of ANC Check-Up.

The pregnancy and related factors associated with late initiation of ANC check-up are parity, gravidity, previous experience on abortion, advice from significant others, pregnancy related history of illness, decision making on own health care affairs and low knowledge on ANC service(table7 and 8)

Table 7: binary logistic regression result for socio-cultural factors associated with late ANC, Aleta Chuko, 2017

Variables	Category	Outcome variable		COR	P-value
		Late attendants(1)	Early attendants(0)		
Paternal polygamy	Yes	20(74.1%)	7(25.9%)	1.53 (.63-3.68)	.35
	No	292(65.2%)	156(34.8%)	1	
Getting Advise	Yes	254(68.3%)	118(31.7%)	1	
	No	58(56.3%)	45(43.7%)	.59(.38-.94)	.02
Family support	Yes	252(65.6%)	132(34.4%)	.98 (.61-1.59)	.95
	No	60(66%)	31(34%)	1	
Decision on own health care	Pregnant Woman	10(45.5%)	12(54.5%)	1	
	Pregnant Woman and husband	302(66.7%)	151(33.3%)	2.4(1.01-5.68)	.05
Decision on using current ANC	Pregnant Woman	26(59%)	18(41%)	1	
	Pregnant Woman and husband	286(66.4%)	145(33.6%)	1.366(.73-2.57)	.33

Table 8: binary logistic regression result of obstetric and related factors for pregnant women, Aleta chuko district, 2017.

Variables	Category	Outcome variable		COR	P-value
		Late attendants(1)	Early attendants(0)		
Gravidity	One	88(50%)	88(50%)	1	
	Two	94(72.3%)	36(27.7%)	3.49 (2.11-5.76)	.00
	three and above	130(77%)	39(23%)	4.14 (2.58-6.63)	.00
Parity	0nce	67(58.3%)	48(41.7%)	1	
	Twice	67(82.7%)	14(17.3%)	3.43 (1.73-6.8)	.00
	Above two	67(87%)	10(13%)	4.8 (2.24-10.27)	.00
birth interval	Less or equal to 2 years	27(73.5%)	10(27%)	.96(.44-2.10)	.92
	Above two years	174(73.7%)	62(26.35%)	1	
Method of delivery	Cesarean section	36(72.3%)	10(27.7%)	.739(.346-1.579)	0.435
	Vaginal delivery	165(72.7%)	62(27.3%)	1	
Delivery place	Home	118(75.2%)	39(24.8%)	1.203(.7-2.07)	.504
	Health facility	83(71.6%)	33(28.4%)	1	
Previous ANC	Yes	151(73.3%)	55(26.7%)	1	
	No	47(70.1%)	20(29.9%)	.856(.46-1.57)	.616
History of stillbirth	Yes	13(65%)	7(35%)	.64(.25-1.68)	.37
	No	188(74.3%)	65(25.7%)	1	
History of	Yes	15(53.6%)	13(46.4%)	1	

Abortion?	No	297(66.5%)	150(33.5%)	1.72(0.79-3.7)	.17
History of illness in current pregnancy?	Yes	87(61.7%)	54(38.3%)	1	
	No	225(67.4%)	109(32.6%)	1.28(.85-1.93)	.24
pregnancy planned	Yes	285(66%)	147(34%)	1	
	No	27(62.8%)	16(37.2%)	.87(45-1.67)	.68
Pregnancy test	Missed period	188(64.2%)	105(35.8%)	.84(.56-1.24)	.38
	Urine test	124(68.1%)	58(31.9%)	1	
Knowledge on ANC service	low knowledge	301(72.4%)	115(27.6%)	11.42 (5.73-22.76)	0.00
	high knowledge	11(18.6%)	48(81.4%)	1	

5.7. Factors Significantly Associated With Late Initiation of Antenatal Care

From the variables associated with late initiation for ANC in the bivariate binary logistic regression, being housewife and no formal education, gravidity two and above, no abortion history and low knowledge on ANC of pregnant women were statistically significant with late initiation for ANC in the multivariate binary logistic regression.

Hosmer and Lemeshow test is not statistically significant (p=0.232) that it shows the model is adequate and fit. There are no multicollinearity among variables that were candidates for multivariate logistic regression, since variance inflation factor is below two and tolerance is above 0.1.

When all the other variables in multivariate regression adjusted the following, results found. Pregnant women who were housewife, were 3.3 times more late than from those merchant, government employee and self-employed (AOR=3.34; 95%CI, 1.93-5.77) and those who were without formal education are 10.8 times late to start first ANC than with higher educational status (AOR=10.85; 95%CI, 4.77-24.65).

Pregnant women with gravidity two and above are 6.2 times more late to start first ANC than gravidity one (AOR=6.17; 95%CI, 2.94-12.95). Those pregnant women with no history of abortion were 3 times late to initiate ANC timely than those with history of abortion (AOR=2.92;

95%CI, 1.1-7.77). Those pregnant women who did not have high knowledge about ANC service have been 17 times more likely to start ANC late than pregnant women who had high knowledge of ANC service (AOR= 17.05; 95%CI, 7.6-38.18) (Table 9).

Table 9: Multivariate logistic regression analysis result for variables significantly associated with late initiation for ANC among pregnant women attending ANC service in Aleta chuko district, 2017

Variables	Category	Outcome variable		AOR
		Late attendants(1)	Early attendants(0)	
Educational status	No formal education	105(86.1%)	17(13.9%)	10.85(4.77-24.65)**
	Primary school(1-8)	186(67.6%)	89(32.4%)	4.69(2.44-8.99)**
	Secondary and above	21(26.9%)	57(73.1%)	1
Occupation	Housewife	266(71.9%)	104(28.1%)	3.34(1.93-5.77)**
	Government employee, merchant and self employed	46(43.8%)	59(56.2%)	1
Gravidity	One	88(50%)	88(50%)	1
	Two	94(72.3%)	36(27.7%)	5.31(2.74-10.28)**
	three and above	130(77%)	39(23%)	6.17(2.93-12.95)**
History of abortion	Yes	15(53.6%)	13(46.4%)	1
	No	297(66.5%)	150(33.5%)	2.92(1.1-7.77)*
Knowledge percentage	poor	301(72.4%)	115(27.6%)	17.05(7.6-38.18)**
	Good	11(18.65%)	48(81.35%)	1

**statistically significant, (p<0.001), *statistically significant, (p<0.05), COR: crude odd ratio, AOR: adjusted odd ratio, 1: reference category.

Chapter Six: Discussion

The study attempted to assess the magnitude and associated factors of late initiation of antenatal care at Aleta chuko district. World Health Organization recommends that pregnant women, especially those who are living in developing countries shall start ANC initiation in the first three months of pregnancy. However, in this study 65.7% respondents made ANC booking beyond the recommended time. The reasons like not knowing the right time of ANC initiation and its purpose 151(31.8%), ignorance to initiate ANC 52(10.9%) and busy by other work 67(14.1%) were the reasons largely provided for specific timing among the late attendants. The factors associated with having late initiating for ANC visit include being housewife and no formal education of pregnant women, gravidity two and above, no abortion history and low knowledge of ANC service.

The magnitude of pregnant women who initiated ANC late was higher than that of report of Myanmar, Malaysia (56.2%) (12) and less than magnitude of late attendants reported in study conducted in south-eastern Tanzania (71.1%) (16). A study with same topic conducted in copper belt province of Zambia (72%, 68.6%) (28)Within two districts revealed worse magnitude. The magnitude of pregnant women who started late found lower compared to a study done in Debreberhan in centeral Ethiopia (73.8%), Arbaminch town (82.6%) and Kambata Tambaro zone (68.6%) (17, 23, 29) and was higher comparing to a study done in Dilla town governmental health institutions (49.7%) (30). The difference in socio-economic status or awareness on the importance of early initiation for ANC or education level among study populations, or differences in time of study or study area whether urban or rural might be the responsible for the difference.

Educational status has been a one factor for late initiation of ANC check-up (AOR=10.8; 95%CI, 4.77-24.65). Pregnant women who had no formal education were later to initiate ANC check-up than those who had secondary and above educational status. This finding was consistent with report of study result conducted in Dilla Town in southern Ethiopia and this might be due to socio-demographic similarity. Report of study conducted in Ningxia in China, Southwestern Nigeria, Cambodia and Myanmar in Malaysia were also in line with result and this might be due to similarity of educational background (15, 12, 19 and 26).

Being housewife is also one associated factor with late initiation of ANC (AOR=3.34; 95%CI, 1.93-5.77). Those housewives are 3.3 times late to ANC check-up later than those pregnant

women who were merchant, self-employed and government employee. This is due to housewives might be were carrying of many responsibilities in home and they had also shortage of money for transportation and other services.

Gravidity has been also among the factors that contribute for late initiation of ANC check-up that gravidity two and above are more likely to initiate first ANC late than those with gravidity one(AOR=6.17; 95%CI, 2.93-12.95) and this finding was in line with report of study conducted in Cambodia (AOR=0.15; 95%CI, 0.10—0.23) (26). Socio-demographic factors like family size might be the reason for similarity of report. In this study, 54 pregnant women who had ignored to initiate ANC check-up timely, 52(96.3%) had been late to start ANC check-up timely. This might be due to less awareness to ANC importance. One study from Australia had reported that pregnant women with high gravidity had been late to start ANC check-up than with low gravidity (AOR = 2.17, 95%CI, 2.05–2.30). This similarity might be due to socio-economic background since majority of respondents pregnant women were migrants from developing countries (18).

The pregnant women with no history of abortion were later than those who had abortion history to initiate ANC check-up timely (AOR=2.92; 95%CI, 1.1-7.77). This might be due to less awareness of pregnant women towards pregnancy complication. This report is consistent with report of the same study conducted in Adigrat, Ethiopia and southeastern Tanzania (19, 16). This might be due to similarity of educational and economic background.

Low knowledge towards ANC service has been also one factor for late ANC initiation (AOR=17.05; 95%CI, 7.6-38.18). The Pregnant women who had low knowledge on ANC service, were later to start ANC than those who had high knowledge on ANC services. This finding is consistent with same study conducted in Debreberhan health facilities, central Ethiopia (AOR=3.10; 95%CI, 1.80-5.33). Another study in Zambia reported that pregnant women with low knowledge had been more late to initiate ANC check-up timely (AOR=2.205; 95%CI, 1.02-4.76) (29, 30). In this study, 31.79% of late attendants reported for specific timing that they did not know the right time to attend ANC and its purpose. The other late attendants neglected the ANC check-ups since they did not know its importance and purpose. This is due to less awareness towards importance of ANC service and negative consequence of not following ANC service and low educational status.

6.1. Limitation

The governmental public health centers have been preferred to conduct this study due to their accessibility to majority of the community of the district; however, there might have been pregnant women who attended in private clinics. Therefore, this study has lacked to address the pregnant women who attended in private clinics because they may made socio demographic difference. In addition, since this study was facility based study it may lacks generalization about all pregnant women of the district and so community-based study is better to address all pregnant women in the district.

Chapter Seven: Conclusion and Recommendations

7.1. Conclusion:

The study has identified the magnitude, factors for late initiation of ANC check-up among pregnant women of Aleta chuko district, and has reported that high magnitude for late initiation of ANC. The factors associated with late initiation of ANC were being housewife, no formal education, gravidity two and above, no history of abortion and low knowledge of ANC services. These results has reflected the presence of low awareness of pregnant women about the right knowledge of modern ANC services and its importance and low level of educational status which might be responsible for late initiation of ANC service.

7.2. Recommendation:

We recommend Aleta Chuko District health bureau and Sidama Zone health office that community mobilization strengthened at all level to address low awareness of ANC services. Mobilization of community should include groups of pregnant women and their families to disseminate the information easily. Information dissemination should be on encouragement of pregnant women and reproductive age women to go school and continue their education. Benefits of ANC services and correct time to initiate ANC be also focused. In addition, information on dangers on late starting for ANC and home delivery also should be stressed. Finally, health care providers should give attention to identified problems and try to counsel them on post deliver family planning counseling to prevent unplanned pregnancy. This would empower them with the right knowledge on ANC services. There should be effective collaboration of ANC providers at all levels (midwives, health extension workers, other health professionals and community leaders) since effective use of ANC services by pregnant women requires efforts from the health professionals and community members.

References:

1. Maternal and Child health Advocacy International, June 2014 | Vol.2014, pp. 136.

2. Villar J, Bergsjø P. New WHO antenatal care model: Randomized trial. World Health Organization, Geneva: WHO; 2002.

3. Federal Democratic Republic of Ethiopia, Ministry of Health. Antenatal Care, Part 2 Blended Learning Module for the Health Extension Program.

4. International Journal of MCH and AIDS. Late Pregnancy Outcomes among Women who attended and Women who did not Attend First Trimester Antenatal Care Visits in a Suburban Regional Hospital in Cameroon, 2016 |Volume 5, No. 1, 14-23

5. Anja Smith. Why women are not accessing antenatal care early in their pregnancies, 2016

6. Euro-Peristat Project with SCPE And EUROCAT. European Prenatal Health Report. The Health and Care of Pregnant Women and Babies in Europe In 2010. May 2013. Available www.europeristat.com

7. Late Antenatal Booking, Its Barrier And Maternal Complications. Isra Medical Journal | Volume 7 - Issue 1 | Jan - Mar 2015

8. Ethiopia Mini Demographic and Health Survey, August 2014.

9. Rowe RE. Garcia J. Social class, ethnicity and attendance for antenatal care in the United Kingdom: a systematic review Public health Med. 2003; 25(2):113-9.

10. Jenny A Cresswell, Ge Yu, Bethan Hatherall, Joanne Morris, Farah Jamal, Angela Harden3 and Adrian Renton. Predictors of The Timing Of Initiation Of Antenatal Care In An Ethnically Diverse Urban Cohort In The UK, 13:103. http://www.biomedcentral.com/1471-2393/13/103

11. Faith Yego, Catherine D'Este, Julie Byles, Jennifer Stewart Williams and Paul Nyongesa. Risk factors for maternal mortality in a Tertiary Hospital in Kenya: a case control study, 2014, 14:38 http://www.biomedcentral.com/1471-2393/14/38

12. Thin Z. Aung, Win M. Oo, Win Khaing, Nay Lwin, Hlaing T. Dar. Late Initiation Of Antenatal Care And Its Determinants, 2016. DOI: 10.18203/2394-6040.ijcmph20160926

13. Estimates by WHO, UNICEF, UNFPA, World Bank Group and the United Nations Population Division. Trends in Maternal Mortality: 1990 to 2015.

14. Ethiopian Demographic And Health Survey, 2016

15. WHO. Strategies toward ending preventable maternal mortality, 2015

16. Karin Gross, Sandra Alba, Tracy R Glass, Joanna Armstrong Schellenberg and Brigit Obrist Timing of antenatal care for adolescent and adult pregnant women in south-eastern Tanzania, 2012. 12:16. http://www.biomedcentral.com/1471-2393/12/16

17. Tesfalidet Tekelab, Balcha Berhanu. Factors Associated with Late Initiation of Antenatal Care among Pregnant Women Attending Antenatal Clinic at Public Health Centers in Kembata Tembaro Zone, Southern Ethiopia, 2014. DOI: http://dx.doi.org/10.4314/star.v3i1.17

18. Lieu Thuy Thi Trinh and George Rubin. Late Entry to Antenatal Care In New South Wales, Australia, 2006. Reproductive Health 2006, 3:8 doi: 10.1186/1742-4755-3-8

19. Adekanle DA, Isawumi AI. Late Antenatal Care Booking and Its Predictors among Pregnant Women In South Western Nigeria. *Online J Health Allied Scs.* 2008;7(1):4

20. Onasoga, Olayinka A., Afolayan, Joel A and Oladimeij, Bukola D. Factors influencing utilization of antenatal care services among pregnant women in Ife Central Lga, Osun State Nigeria, 2012, 3 (3):1309-1315. *Available online a*t www.pelagiaresearchlibrary.com

21. Wondwossen Lerebo, Abrehet Kidanu and Mache Tsadik. Magnitude and Associated Factors Of Late Booking For Antenatal Care In Public Health Centers Of Adigrat Town, Tigray, Ethiopia, 2015. 12:1 http://dx.doi.org/10.4172/2090-7214.1000171

22. Belayneh T, Adefris M, and AndargieG. Previous Early Antenatal Service Utilization Improves Timely Booking, 2014: Cross-Sectional Study At University Of Gondar Hospital, Northwest Ethiopia. Available in the web site http://www.hindawi.com/journals/jp/2014/132494/

Volume 2014, Article ID 132494, 7 pages http://dx.doi.org/10.1155/2014/132494

23. Feleke Gebremeskel, Yohannes Dibaba, and Bitiya Admassu. Timing of First Antenatal Care Attendance and Associated Factors among Pregnant Women in Arba Minch Town and Arba

Minch District, Gamo Gofa Zone, South Ethiopia, 2015. Vol 2015, Article ID 971506, 7 pages http://dx.doi.org/10.1155/2015/971506

24. Christiana R Titaley, Michael J Dibley, Christine L Roberts. Factors associated with underutilization of antenatal care services in Indonesia: results of Indonesia Demographic and Health Survey 2002/2003 and 2007, 10:485.

25. Ouendo Edgard-Marius, Sossa Jerome Charles, Saizonou Jacques, Guedegbe Capo-Chichi Justine, Mongbo Ade Virginie, Mayaki Alzouma Ibrahim, Ouedraogo T. Laurent. Determinants Of Low Antenatal Care Services Utilization During The First Trimester Of Pregnancy In Southern, Benin Rural Setting. 3(5): 220-228, 2015 . DOI: 10.13189/ujph.2015.030507

26. Ranjan Kumar Prusty . Somethea Buoy, Prahlad Kumar and Manas Ranjan Pradhan. Factors associated with utilization of antenatal care services in Cambodia, 2015J Public Health (2015),

23:297–310. DOI 10.1007/s10389-015-0680-9

27. Isaac Banda, Charles Michelo, Alice Hazemba. 2012. Factors Associated with late Antenatal Care Attendance in Selected Rural and Urban Communities of the Copper belt Province of Zambia. Medical Journal of Zambia, Vol. 39, No. 3

28. Brian Muyunda, Mpundu Makasa, Choolwe Jacobs, Patrick Musonda and Charles Michelo .Higher educational attainment associated with optimal antenatal care Visits among childbearing Women in Zambia, 2016. doi: 10.3389/fpubh.2016.00127

29. Amtatachew M. Zegeye, Bikes D. Bitew and Digsu N. Koye. Prevalence and Determinants of Early Antenatal Care Visit among Pregnant Women Attending Antenatal Care in Debre Berhan Health Institutions, Central Ethiopia, 2013. *Afr J Reprod Health 2013; 17[4]: 130-136.*

30. Teshome Abuka, Abebe Alemu and Balcha Birhanu. Assessment of Timing of First Antenatal Care Booking and Associated Factors among Pregnant Women who attend Antenatal Care at Health Facilities in Dilla town, Gedeo Zone, Southern Nations, Nationalities and Peoples Region,Ethiopia,2014. 3:3 http://dx.doi.org/10.4172/2376-127X.1000258

31. Dennis Isaac Ifenne and Bernard TerkimbiUtoo. Gestational Age At Booking For Antenatal Care In A Tertiary Health Facility In North Central Nigeria, 2012. Niger Med J. 53(4): 236–239. doi: 10.4103/0300-1652.107602

32. Girmatsion Fisseha, Gebremeskel Miruts, Mulu Tekie, Abraha W/Michae, Dejen Yemane,Tesfay Gerezigiher .Predictors of Timing of First Antenatal Care Booking at Public Health Centers in Mekelle City, Northern Ethiopia. Journal of Gynecology and Obstetrics 2015; 3(3): 55-60. Access at: http://www.sciencepublishinggroup.com/j/jgo

33. Tadele Girum. Assessment of Timing of First Antenatal Care Visit and Associated Factors Among Pregnant Women Attending Antenatal Care in Dilla Town Governmental Health Institutions, Southern Ethiopia, 2016, 5:3.DOI: 10.4172/2327-5162.100022

34. Temesgen W Gudayu. Proportion and Factors Associated with late Antenatal Care Booking Among Pregnant Women in Gondar Town, North West Ethiopia. African Journal of Reproductive Health June 2015; 19 (2): 93

35. Patel BB, Gurmeet P, Sinalkar DR, Pandya KH, Mahen A, Singh N. A Study On Knowledge And Practices Of Antenatal Care Among Pregnant Women Attending Antenatal Clinic At A Tertiary Care Hospital Of Pune, Maharashtra. Med J DY Patil Univ 2016; 9:354-62.

Annex: Questionnaire and Knowledge Questions Frequency Table

Table 10: frequency of answers related to knowledge of pregnant women on ANC, Aleta Chuko, 2017

Variable	N=475	Category	Number	Percent
ANC definition	regular medical and nursing care during pregnancy	Yes	302	63.6
		No	173	36.4
	treat and prevent potential problems of pregnancy	Yes	284	59.8
		No	191	40.2
	promoting healthy for both mother and child	Yes	217	45.7
		No	258	54.3
Uses of ANC	To avoid complications	Yes	274	57.7
		No	201	42.3
	reduces maternal and infants mortality and morbidity	Yes	281	59.2
		No	194	40.8
	To know health of mothers	Yes	236	49.7
		No	239	50.3
	To know condition of baby	Yes	146	30.7
		No	329	69.3
	For safe delivery	Yes	82	17.3
		No	393	82.7
Pregnancy danger signs	Excessive vomiting	Yes	162	34.1
		No	313	65.9
	Persistent swelling of limbs	Yes	89	18.7
		No	386	81.3
	Vaginal bleeding/discharge	Yes	210	44.2
		No	265	55.8
	Convulsion	Yes	107	22.5
		No	368	77.5
	Weak or no movement of fetus	Yes	165	34.7
		No	310	65.3
	Visual disturbance	Yes	49	10.3
		No	426	89.7

	Persistent fever	Yes	75	15.8
		No	400	84.2
	severe headache	Yes	142	29.9
		No	333	70.1
pregnant woman need at least five antenatal check-up		Yes	354	74.5
		No	121	25.5
Ideal deliver place is HF,		Yes	409	86.1
		No	66	13.9
ANC starts on or before 4 fourth month		Yes	291	61.3
		No	184	38.7

English questionnaire

Jimma University institute of Health Sciences Department of Epidemiology, Questionnaires to assess late antenatal care initiation and associated factors among pregnant women attending ANC clinics at public health institutions in Aleta Chuko District, Sidama Zone. Hello, my name is _____ and I am staff in this health facility. As part of this survey, we are collecting information on late antenatal care initiation and associated factors among pregnant women attending ANC clinics at health institutions in Aleta Chuko District. We will include all women who came for first ANC visit. The survey will take about 25 minutes. The questionnaire includes socio-demographic and obstetric factors etc. All information you provide will be kept confidential. I will not include any identifiers, such as your name or exact address. Only honest answers would contribute for improvement of health planning. Your role in the success of the research is important and I appreciate your contribution to the research. Would this be okay for you? I understood about the advantage of the research and the roles I will have in the research. I have agreed to participate in the research. A. Yes B. No. If respondent agrees to interview, starting time ---------- ending time----------

_____

Thank you for your participation!

Date of data collection _____

Name of data collector _____ Signature _____

Name of supervisor _____ Signature _____

Section 1: Socio-demographic information			
s. no	Questions	Code	Go to
01	Age of pregnant woman	_____	
02	Marital status	1. Single 2. Married and live together currently 3. Cohabitation 4. Separated, divorced or widowed	
03	Residence	01. Urban 02. Rural	
04	Does your husband have another wife?	1.Yes 2. No	
05	Age during marriage	_____	
06	Religion	01. Orthodox 02. Catholic 03. Protestant 04. Muslim 05. others	
07	Ethnicity	01. Sidama 02. Silte 03. Gurage 04. others	
08	Occupation	01. House wife 02. Government employee 03. Private employee 04. employed self 05. merchant 06. student 07. farmer 08. Others(specify) _____	
09	Educational level [Grade completed	1. Illiterate [cannot read and write] 2. Literate [able to read and write] 3. Primary [1-8] 4. Secondary [9-10] 5. College diploma and above	
10	Monthly house hold income in Ethiopian Birr	_____	
11	How long it takes for arriving to this health facility.	_____	
12	Family size	_____	
Questions 13-14 asked if 02 is married			

13	Educational level of your husband	1. Illiterate [cannot read and write] 2. Literate [able to read and write] 3. Primary [1-8] 4. Secondary [9-10] 5. College diploma and above	
14	Occupation of your husband?	01. farmer 02. Government employee 03. Private employee 04. employed self 05. merchant 06. student 7. Others(specify) _____	
	Section 2: questions related with past pregnancy		
15	Gravidity (how many times did you become pregnant)?	_____	
16	Had you ever given birth?	1.Yes 2.No	If no go to 24
17	If yes for question 16, how many times did you give birth	_____	
18	If yes for question 16, How many of your pregnancies resulted in a baby that was born alive?	_____	
19	If yes for question 16, what was birth interval?	1. 1-2 years 2. Above two years	
20	If yes for question 16, was there any stillbirth?	1. Yes 2. No	
21.	If yes for question 16, Where did you delivered your last child?	1.home 2. health facility	
22	If yes for question 16, Have you given birth by cs?	1.yes 2. no	
23	If yes for question 16, Had you previous ANC history	1. yes 2. no	
	Questions related with current pregnancy		
24	How do you know if you are pregnant or not?	1.missed period 2. urine test 3.by other method (specify)	
25	Is this pregnancy planned?	1. yes 2. no	
26	Had you any illness in this pregnancy?	1. yes 2. no	
27	Is there anyone who advised you to start ANC?	1. yes 2. no	If no go to 29

28	If yes for question 28, who advised you to start ANC?	1. HEW 2. I heard from Radio/Television 3. Husband 4. mother 5. Sister 6. Friend 7. other	
29	Does your husband or other family member support you financial or by sharing workload during this pregnancy?	1.Yes 2. No	
30	Fundal height is measured by meter or finger or estimated based on LMP	_____	
31	For this pregnancy, why you started by this time?	1. my family advised me 2. from my previous experience 3. I don't know if I am pregnant 4. since it's unplanned pregnancy 5. I don't know the right time and its purpose 6. Perceived appropriate time 7. Busy by other work. 8. For seeking treatment for illness 9. since no illness 10. others	
32	Do you ever have abortion?	1. Yes 2. No	If no, go to 35
33	If yes for 33, no of spontaneous abortion	_____	
34	If yes for 33, no of induced abortion	_____	

Questions related with knowledge on ANC service

35	What do you understand by antenatal care?	1. it is regular medical and nursing care recommended for woman during pregnancy 2. it is to treat and prevent potential health problems throughout the course of the pregnancy. 3. it helps in promoting healthy lifestyles that benefits both mother and child.	

		4. can't say	
36	Is antenatal care necessary to pregnant women?	1. Yes 2. no	
37	If yes, then why is it necessary?	1.To know the condition of baby 2. To know the health of mother 3.To avoid complication 4. For safe delivery 5. It reduces maternal and infants mortality and morbidity 6. Can't say	
38	Should first antenatal check-up done during the first 4 months?	1.Yes 2. No	
39	Does a pregnant women need to come for at least five antenatal check-ups throughout her pregnancy?	1.Yes 2.No	
40	What are the danger signs of pregnancy?	1.Excessive vomiting 2.Persistent swelling of limbs 3.Vaginal bleeding 4.Convulsion 5.Weak or no movement of fetus 6.Visual disturbance 7.Persistent fever 8.severe headache 9.can't say	

SECTION 3: Questions used to assess Decision making status of women

41	Who is in your family usually has final say in the following decisions 1. Your own health care? 2. Using Current ANC	1 Women alone 2 Husband 3 Jointly 4 Others _____ _____ _____ _____ _____ _____ _____ _____	

Thank you very much!

Sidamic Version Questionnaires

Jimmu Universite, Fayyimmate Institute, Epidemiolojete Rosu Kifile

Sidamu Afii Xa'mo

Su'mi'ya _____ yaamamanno. Xa loosanni noommohu kalaa wog eranehu Jimmu Universite, Fayyimmate Institute, epidemiolojete Rosu Kifile layinki digire (Mastersete) rosaancho ikkinohu Alati chukote woradi giddo gumulshu xiinxallo loosanni noo daafira tenne xiinxallora ikkitanno hedo gamba assanni afameemmo. Xiinxallote birxichino; **Aleta chukote woradi giddo mageeshi godowi noo amuwi fayyimate minira yanate doonoki gede assitano korkatuwa xiinxalla** yitannote.

Anino amuwu mereerinni xa'mote kaayyora dooramino amuwa xa'manni noommo daafira atino tenne kaayyo beeqqaancho ikkoottahura hasiissanno dawaro qolattae gede shaqqillunni xa'mireemmohe. Ledeno kummi assate baxeemmori ati qolatta dawaro ikkinnina ate mayimma woyi su'makki horontanni diborreessinanni. Ati qolootta dawaro wolu ayino la"aranna maciishshara didandaanno. Tenne xiinxallorano beeqqaancho ikkattahu baxxe ikkinnina giwate qoossokki agarantinote. Ati kolatta dawaro tenne xiinxallo gumulo iillishate hattono woradinke giddo afamanno amuwinna qaaqquullinsa keeraanchimma woyyeessate lowo kaa'lo assitanno daafira beeqqaancho ikkittaro addinta tashshi yaannonke.

Hanafa dandeemmo?

1. **Dee'ni** ⟶ Galatte uurrisi.
2. **Ee** ⟶ Hanafi

kifle1: mannu heesho gari xamubba			
Kiiro	Xamubba	Maxooshu milikaita	Ka'a ha'ri
01	Godowi no ama diro	_____	
02	Adhamate gara	1. adhatinokita 2. Adhate mitee heedhawota 3. aduulante noota 4. Reenoseta, tidhantinota	
03	Teeso	01. katama 02. gaterete	
04	Galtekira wole galte noosi	1. ee 2. dee'ni	
05	Adhantu waro diru meeheho	_____	
06	Amano mati	01. Orthodox 02. Catholic 03. Protestant 04. Muslim	

		05. others	
07	Illima	01. Sidama 02. Silte 03. Gurage 04. wole	
08	Looso	01. mini galte 02. mangistete looso 03. gilisabete looso 04. umiseni loosata 05. dadalancho 06. rosancho 07. baato loosiranota 08. wole	
09	Rosu deera	1.nababa dandiitanokita 2.nababa dandiitanota 3.Umi dirima [1-8] 4.Layinki dirima [9-10] 5.Collegete diplomana hakuyi alee	
10	Aganuni afidhano eo	_____	
11	Fayimate mini geisha magesha harisanohe?	_____	
12	Matete kiiro	_____	
Xamote kiiro 13-14 xaminanihu kiiro 02 adhantinota ikiturot			
13	Galtete rosu deera	1.nababa dandiitanokita 2. nababa dandiitanota 3. Umi dirima [1-8] 4. Layinki dirima [9-10] 5. Collegete diplomana hakuyi alee	
14	Galtete looso?	01. baato loosiranoha 02. mangistete loosancho 03. gilasabete loosancho 04. umisi looso loosanoha 05. dadalancho 06. rosancho 7. wole	
	Kifle2 : albi ila ledo xaadino xamuwa		
15	Kuni ledo me'e hige godowota	_____	
16	Ilte egenoota?	1. Ee 2. dee'ni	Dee'ni yituro 24 kita hadhi
17	16 ki, xam'ora ee yitaro, mee hige ilota?	_____	
18	16 ki, xam'ora ee yitaro, lubote nooha mea ilota?	1. Zerotenni mittete geeshsha 2. Lamena hakuyi aleenni	
		1.1-2 diri gedensanni	

19	16 ki, xam'ora ee yitaro, meu diri gedensaanni iloota?	2.Lamu diri gedensaanni		
20	16 ki, xam'ora ee yitaro, reenohu ilame egenninohe?	1.ee 2.dee'ni		
21	16 ki, xam'ora ee yitaro, hiiko ilota?	1. mine 2. fayyimate mine 3.rosino budu ilshishaanchonni 4. budu ilshishaanchonni		
22	16 ki, xam'ora ee yitaro, godowa dareenahe ilte egenoota?	1.ee 2. dee'ni		
23	16 ki, xam'ora ee yitaro, kunni albanni godowi heedhe fayyimmate minnira buuxo asirate harata?	1.ee 2. dee'ni		
Xaa godowi ledo xaadanno xaa'mubba				
24	Godowi nootatana nootakita hiisite afata?	1.aganunni fultanno mundee urrituro 2. shumma maramereena 3.wole doogonni		
25	Kone godowa hasidhe godowo?	1.Ee 2.dee'nni		
26	Konne godobbe heedhena xisso noohe?	1.Ee 2.dee'nni		
27	Fayyimate minira daota gede seejinohehu nooni?	1.Ee 2.dee'nni	Dee'nni yituro 29 kita hadhi	
28	28 ki xammora ee yiitaro ayi seejinohe?	1. fayyimate seenni 2. rediote machishooma 3. galteya kulinoe 4. ama'ya kultinoe 5. Rodoo'ya kultinoe 6. Jaala'ya 7. wolu		
29	Galteki woy wolu manni mine loosunni kaa'lannohe?	1. Ee 2. dee'nni		
30	Goodowase metiretenni woy angichunni woy agannu mundee uurritinno barrinni bikinanni	_____		

31	Tenne yannanni mayira hannafita?	1. maate'ya seejitenae 2. alba nooe egennonni 3. Godowinni noomata afa hoogeti 4. hasirummakinni godowomma daafira 5. yannanna horosi afa hoogomma daafira 6. yanna lawenaeti 7. loosu batireennaeti 8. akka'ma'mara daama 9. xissa hooginoehurati 10. wole	
32	Dirre bae egenninohe?	1.Ee 2.dee'nni	Dee'nni yituro, 35 kitera ha'ri
33	29 kitera ee yiitaro, ummisinni baenohu me'eho	_____	
34	29 kitera ee yiitaro, xaggichunni baenohu me'eho	_____	

Egennote ledo xaadinno xamubba

35	Godowi no amuwi fayyimate agarooshshe ya mayate?	1. yanna baala godowi noo amara uyinnanni kaloti 2. meentu godowinni heerenna uyinnanni keeranchimata irkootti 3. godowinni noo amarana qaaqoho assinanni kerranchimate loosotti 4. dafooma	
36	Godowi noo amuwira uyinnanni agarooshshi hasisanohonni?	1. Ee 2. dee'nni	
37	33 kita Ee yitaro mayirra hasisano?	1. Qaaqu qarra afate 2. Amate keeranchimma afate 3. Kalaqamanno qarra afate 4. Qarru nookiha ilate 5. Amatenna qaaqulu reyana xissama hoolate 6. Dafooma	
38	Umitti fayyimate agarooshshi lao shoolu aganninni hanafanonni	1. Ee 2. dee'nni	
39	Godowwi noo ama fayyimate minnira ontenna hakuyi alee hige dagannonni?	1. Ee 2. dee'nni	
40	Godowinni hee'nnana bushsha milikitati yinnannihu hiikoyeti?	1. Lowo geeshsha tushiisha 2. Bisu baali hige hige fuuga 3. Bilitete widoonni mundee fula	

		4. Bissu baxeeyo garrinni milli yaa 5. Godowu giddo qaaqullu milli ya hooga 6. La'nnanni woyite illete mannu lame ika 7. Yanna baala iibabishsha 8. Ummo danbete damuunsa 9. dafooma	
Minni giddo uuyinnanni wusane la'ano xamubba			
41	Minni'nne gido woreedi xamuwara wosannnnohu ayiti 1. ummiki keeranchima akamate? 2. godowi noo amuwi keeranchimma afirate	1 2 3 4 Ama challa galte miteenni wolu manni _____ _____ _____ _____ _____ _____ _____ _____	

Low geeshsha galatemmohe