



JIMMA UNIVERSITY

COLLEGE OF HEALTH SCIENCES

DEPARTMENT OF POPULATION AND FAMILY HEALTH

COMPLIANCE TO NATIONAL IYCF RECOMMENDATION AND ASSOCIATED FACTORS AMONG MOTHERS CHILDREN 6-23 MONTHS OF AGE IN GOMBORA DISTRICT, SOUTH ETHIOPIA: COMMUNITY BASED CROSS SECTIONAL STUDY.

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A THESIS SUBMITTED TO JIMMA UNIVERSITY COLLEGE OF HEALTH SCIENCE, DEPARTMENT OF POPULATION AND FAMILY HEALTH, IN PARTIAL FULLFILMENT OF MASTERS DEGREE IN REPRODUCTIVE HEALTH

JUNE, 2016

JIMMA, ETHIOPIA

COMPLIANCE TO NATIONAL IYCF RECOMMENDATION AND ASSOCIATED FACTOR AMONG MOTHERS CHILDREN 6-23 MONTHS-OF-AGE IN GOMBORA DISTRICT, SOUTH ETHIOPIA: COMMUNITY BASED CROSS SECTIONAL STUDY.

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## ABSTRACT

**Background:** Nutrition in infancy and early childhood is a critical determinant of health and productivity of the individual throughout life. During this period, appropriate, safe, nutritionally adequate and frequent feeding is essential. Despite this recommendation and the health benefits of appropriate complementary feeding inappropriate complementary feeding is commonly practiced. There is no information compliance to national IYCF recommendation and associated factors among mothers of children age 6-23 months in the area.

**Objective:** To assess compliance to national IYCF recommendation and associated factors among mothers of children 6-23 months of age in Gombora district, South Ethiopia.

**Method:** Community-based cross-sectional study design was employed in Gombora district from March 1 to March 30, 2016. The data were collected from 379 respondents selected by simple random sampling technique using pre-tested and semi-structured interviewer administered questionnaire. Bivariate analysis and multivariable logistic regression were employed to identify factors associated with compliance to IYCF.

**Results:** Of the total 379 study subjects, 13.5% (95% CI =10,17.5) of the respondents were reported as they comply with national IYCF recommendation; in multivariable analysis, the odds being compliant to national IYCF recommendation was 5.26 times as much for those respondents (9-12) grades of educational status and above than primary education(1-8)(AOR=5.26;95% CI:2.318,11.914), accordingly the odds being compliant was 3.88 times as much for those mothers of children within the age group(18-23)months than mothers of children age(6-11)months (AOR=3.88; 95%CI:1.641,9.162), the odds of being compliant to national IYCF recommendation was 3.95 times as much for antenatal care visits greater than or equal to four than less than four antenatal visit (AOR=3.95;95%CI:1.840,8.488) and similarly the odds of being compliant was 2.95 times as much for those respondent who had postnatal care visit than no post natal care visit (AOR=2.95;95%CI:1.318,6.349) and the odds being non-compliant to national IYCF recommendation was 81% times among those who were not knowledgeable on indicators IYCF than those knowledgeable(AOR=0.19 ;95%CI:0.075,0.465) and the odds being compliant 6.02 times as much for those counseled on IYCF than those with no counseling on IYCF (AOR=6.02;95%CI:2.786,12.998).

**Conclusion and recommendations:** This study revealed that compliance to national IYCF recommendation was low in the area compared with other countries. Nutrition education to mothers at every contact opportunity was recommended and mothers who were completed only primary education need more attention. All mothers must be encouraged to make antenatal care follow up at least four times.

## ACKNOWLEDGEMENTS

First, I would like to express my deepest gratitude to my advisors Dr. Mekitie Wondafrash (MD, DFSN) and Mrs. Meseret Tamrat (BSc, MSc) for their contributions and constructive comments they have provided during the whole course of the research.

I would also like to extend my thanks to Jimma University College of Public Health and Medical Sciences, Department of population and family health for providing me the opportunity to carry out this study.

My appreciation goes to data collectors and supervisors for their active participation in the study

I would also like to extend my gratitude for Hadiya Zone health department, Gombora woreda health office and study participants for their valuable contribution in the realization of this study.

Above all, my gratitude and thanks goes to the Almighty God in all respects in my life.

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## ACRONYMS & ABBREVIATIONS

ANC: Antenatal care

CBN: Community based nutrition

CF: Complementary feeding

CFP: Complementary feeding practice

CI: confidence interval

EDHS: Ethiopian Demography Health Survey

FANTA: Food and Nutrition Technical Assistance

FMOH: Federal Ministry of Health

HMIS: Health information management system

IYCF: Infant and Young Child Feeding

NGO: Non-Governmental Organization

PHCU: Primary health care unit

SNNPR: Southern Nation Nationalities Peoples Region

SPSS: Statistical Package for Social Sciences

SRS: Simple Random Sampling,

WHO: World Health Organization

## CHAPTER ONE:

### INTRODUCTION

#### 1.1 BACKGROUND INFORMATION

Worldwide, more than 9 million children under 5 years of age die each year. Malnutrition underlies a majority of these U5 deaths, 70% of which occur in the first year of life (1). Complementary feeding practice is a significant determinant of the nutritional status of infants. It is during this period of transitioning from exclusive breastfeeding to family foods that the incidence of malnutrition rises sharply resulting in deficits that are hard to compensate for in later childhood and in life (2).

Infant and Young Child Feeding is a set of well-known and common recommendations for appropriate feeding of newborn and children less than two years of age and is a critical component of care in childhood (3). It denotes the transition of an infant from exclusive breastfeeding to a family diet characterized by timely introduction of solid and semisolid foods with increasing amount, meal frequency and dietary diversity as the child gets older, while maintaining frequent breastfeeding (4).

World Health Organization recommend indicators for appropriate feeding for children age (6-23 months). Indicators that measure appropriate complementary feeding including timely initiation of complementary food with correct dietary diversity and meal frequency (5).

Poor feeding practices are a serious obstacle to attaining and maintaining health of this age group; about 220 000 child lives could be saved every year with promotion of optimal breastfeeding and appropriate complementary feeding. Interventions promoting optimal complementary feeding could prevent up to 6% of deaths in countries with high mortality rates (6). Child malnutrition, morbidity and mortality are reduced when mothers comply with the IYCF recommendations (7).

While under-nutrition usually peaks at the age of 3-18 months making the child's first two years of life are considered „a critical window of opportunity“ for the prevention of growth faltering and under-nutrition (8).

## 1.2 STATEMENT OF THE PROBLEM

Compliance to the recommended (IYCF) practice has been shown to be very low. Globally, only a third of breastfed infants 6–23 months of age met the criteria of recommended WHO IYCF practices (9). In developing countries only less than one-third of 6-23 months old children are fed in accordance with IYCF practices as per recommended (10). In India, country with the highest number of stunted children only 7 per cent children between ages of 6-23 months met the recommended WHO IYCF criteria; In Nigeria, a country with the third highest burden of stunting, only 21 per cent of breastfed children are fed in accordance with IYCF practices as per recommended (11).

In Ethiopia only 51% of children age 6-9 months received complementary foods and; 4% received foods from at least four food groups, while 48% were fed the minimum number of times or more and only 4% of youngest children 6-23 months are fed in accordance with IYCF practices as per recommended (12).

Inappropriate complementary feeding practices increase the risk of under nutrition, illness, and mortality in infants and young children less than 2 years of age (13). Greater than two-thirds of malnutrition related child deaths are associated with inappropriate feeding practices during the first two years of life (14).

Worldwide in 2012, it was estimated that 162 million children under five were stunted and almost 100 million had wasted, mainly due to poor feeding and repeated infections (3). Global progress on reducing stunting has been extremely slow; the proportion of stunted children fell from 39.7% in 1990 to 26.7% in 2010 – only 13 percentage points in 20 years. Progress is even slower in Africa, which has seen an overall reduction of just 2% in 20 years from 40.3% in 1990 to 38.2% in 2010. In West Africa, stunting rates have stagnated at 38% (9).

In Ethiopia, 44 % of children are stunted, 9 % are wasted, and 25 % are underweight which informed the occurrence of both acute and chronic under nutrition (15).

There exists a significant gap in explaining why in spite of the adoption of high impact IYCF policies and guidelines in Ethiopia, there is still low compliance to the recommended IYCF practice and high prevalence of malnutrition.

## CHAPTER TWO: LITERATURE REVIEW

### 2.1. General over view

Complementary feeding is defined as the process of adding complementary foods to the diet of an infant when breast milk is no longer adequate to meet nutritional needs. This process should be initiated at six months of age and continue until the child is on the family diet (16). The World Health Organization's guiding principles for complementary feeding of the breastfed child sets the standards for developing locally appropriate feeding recommendations. Infant and young child feeding indicators including introduction complementary feeding commence at six month, minimum meal frequency and minimum dietary diversity and minimum acceptable diet were estimated by recall of food consumption during the previous day of the survey as per WHO/UNICEF guidelines(5).A child was judged to have taken 'adequate number of meals if he/she received at least the minimum frequency for appropriate complementary feeding (that is, 2 times for 6–8 months and 3 times for 9–23months in 24 hours. For non-breastfed children, the minimum meal frequency was 4(17, 18). Dietary diversity; at least four out of seven food groups. The 7 foods groups used for minimum dietary diversity indicator are:(i) grains, roots and tubers; (ii) legumes and nuts; (iii) dairy products; (iv) flesh foods; (v) eggs; (vi) vitamin A rich fruits and vegetables; and (vii) other fruits and Vegetables (17, 18).

### 2.2 Overview of compliance to IYCF practices:

A community based cross sectional study done in Sirlanka among mothers of children aged 6–23 months showed that fulfilled compliance criteria for appropriate complementary feeding was found to be 68% (19). Another study done in Nepal among children aged 6–23 months showed that mothers meet criteria appropriate complementary feeding considering timing of introduction of solid and semi-solid food with recommended dietary diversity and meal frequency was 32% (20).

Institutional based study done Nairobi of Kenya over all compliance to recommended IYCF practices considering indicators of appropriate complementary feeding or are fed in all IYCF practices found to be 51 % (21).

A community-based cross-sectional study was done in northern Ghana among children aged 6–23 months shows mothers compliance rate considering appropriate complementary feeding indicators namely timing of introduction of complementary foods with dietary diversity and meal frequency was found to be 15.7% (22).A descriptive cross sectional study was conducted in Kenya among mothers having children aged 6–23 months shows the mothers' level of

compliance with recommended (IYCF) indicators with all IYCF practices found to be 55% (23).

Another study done in Zambia among children aged 6–23 months show that the mothers' level of compliance with recommended (IYCF) practice indicators or appropriate complementary feeding was 25.1 (24). Study done in Tanzania shows mothers introduce appropriate complementary food to their children was found to be 15.5% (25).

Ethiopian Demographic Health Survey (2011) results show that only 4 percent of youngest children 6-23 months were fed in accordance With IYCF practices. More than nine children of every ten (96 percent) received breast milk or milk products during the 24-hour period before the survey, and half of the children (49 %) were feed at least the minimum number of times. Five percent of children were feed according to minimum standards with respect to food diversity (four or more food groups) (12).

## 2.2 Factor associated with compliance to IYCF practices

### 2.2.1 Maternal socio-demographic related factors

A community based cross sectional study done in Sirlanka with compliance with IYCF recommendation among mothers having children aged 6–23 months showed that maternal age were significantly associated with mothers fulfill compliance criteria according to IYCF guide line(19).

Studies in in Zambia also shows mother's compliance with IYCF recommendation significantly associated with elder maternal age (24). A community-based cross-sectional study was done in northern Ghana shows higher level of education associated with mother's compliance to IYCF practice (22).

Studies in Zambia (24), in Kenya (23), in Tanzania (25) and EDHS 2011(12) shows maternal education level significantly associated with the compliance with recommended IYCF practices. Another study done in Nepal shows educational status of mother associated with compliance to recommend IYCF practices (20).

A descriptive cross sectional study was conducted in Kenya among mothers having children aged 6–23 months shows maternal age and occupation were associated with compliance to IYCF practice (23).

Another study done in Zambia among mothers having children aged 6–23 months shows the mothers' level of compliance with recommended (IYCF) practice appropriate complementary feeding was 25.1%. In these study variables like, ethnicity, marital status and house monthly income and association with compliance to recommend IYCF practices (24).

### 2.2.2 Child characteristics related factor

A community-based cross-sectional study was done in northern Ghana shows younger children (6–11 months) were less likely to be fed appropriately, compared with older (18–23) month's children (22). A descriptive cross sectional study was conducted in Kenya presence of an immediately older sibling was shown to influence compliance to recommended complementary feeding practice (23). Another Ethiopian demographic Health Survey results shows only 4 percent of youngest children's 6-23 months were fed in accordance with IYCF practices. In this survey older children and children in urban areas are more likely to be fed according to the IYCF practices than younger children (12).

### 2.2.3 Maternal health service utilization related factors

Community-based cross-sectional study was carried out northern Ghana found that mothers attended antenatal care at least 4 times associated with compliance to recommend IYCF practices those mothers who attended ANC less than 4 times (22).

A Community-Based Cross-Sectional Study was Abyi-Adi district Northwest of Mekelle showed that mothers compliance rate with recommended all four indicators was 10.75%. In these/study postnatal care follow up were found to be independent predictor appropriate complementary feeding. And introduced complementary feeding at 6 months age of the children as per recommended was approximately 79.7%. Only seventy six (17.8%) mothers attain four or more food groups to their child meeting the minimum dietary diversity criteria on the day preceding the study. One hundred seventy one (40.0%) mothers fed their children more than two times the day preceding the study (26).

A cross sectional study done in Tanzania shows post-natal visit associated compliance with IYCF recommendation than those whose mothers did not make any post-natal checkups (25).

### 2.2.4 Facility related factor

A community based cross sectional study was conducted in Kenya among mothers having children aged 6–23 months shows the mothers' level of compliance with recommended (IYCF) indicators was 55%. This study shows advice from health providers to be a strong determinant of compliance to recommended complementary feeding practice (23).

#### 2.2.4 Information related variable

Study done Tanzanian that found that exposure to mass media such as radio and television affect compliance to recommend IYCF practices (25). Another secondary data analysis of Demographic and Health Survey 2006 in Nepal and reasons for poor compliance to IYCF practices associated with television ownership (20).

#### 2.2.5 Knowledge related factor

Community based cross-sectional study done in India (Udupi district) shows mothers' level of compliance with recommended (IYCF) practice associated with knowledge status of the mother. In this study those mothers who knowledge with indicators of IYCF more likely compliant with IYCF recommendation (27). Studies in Bangladesh shows knowledge of recommended complementary feeding increase mother's compliance to WHO recommended all IYCF practices (28).

#### 2.2.6 Summary of literature review

Nutritional inadequacy of the complementary in terms of timing, diet and frequency is one of the major problems affecting infants and young children in the world today. Despite the fact that there are various strategies to improve complementary feeding in Ethiopia appropriate complementary feeding practices are largely poor with majority of children receiving complementary foods too early at a lower frequency than recommended and often the diet is limited in diversity. A review of the literature revealed that there are significant gaps in information on the factors associated with appropriate complementary feeding practices according to guide line in comprising: time of initiation, dietary diversity and frequency of feeding. Therefore, the need to investigate compliance to recommended complementary feeding practices considering timing, variety of diet, and meal frequency children aged 6-23 months in the study area.

### 2.3. Significance of the study

Appropriate complementary feeding has been a major strategy to reduce under nutrition during infancy and early child hood. However, issues of compliance with IYCF recommendation remain unresolved. The strategies used for control of nutrition problems need regular review to maintain and improve their effectiveness.

This study will contribute towards the improvement of compliance to IYCF in order to mitigate under nutrition status of infant and young.

Also this study will provide information on the current situation for policy makers, program managers and advocators on compliance to IYCF among mothers.

The paper may be useful to other researchers as reference material while conducting further studies on similar problems.

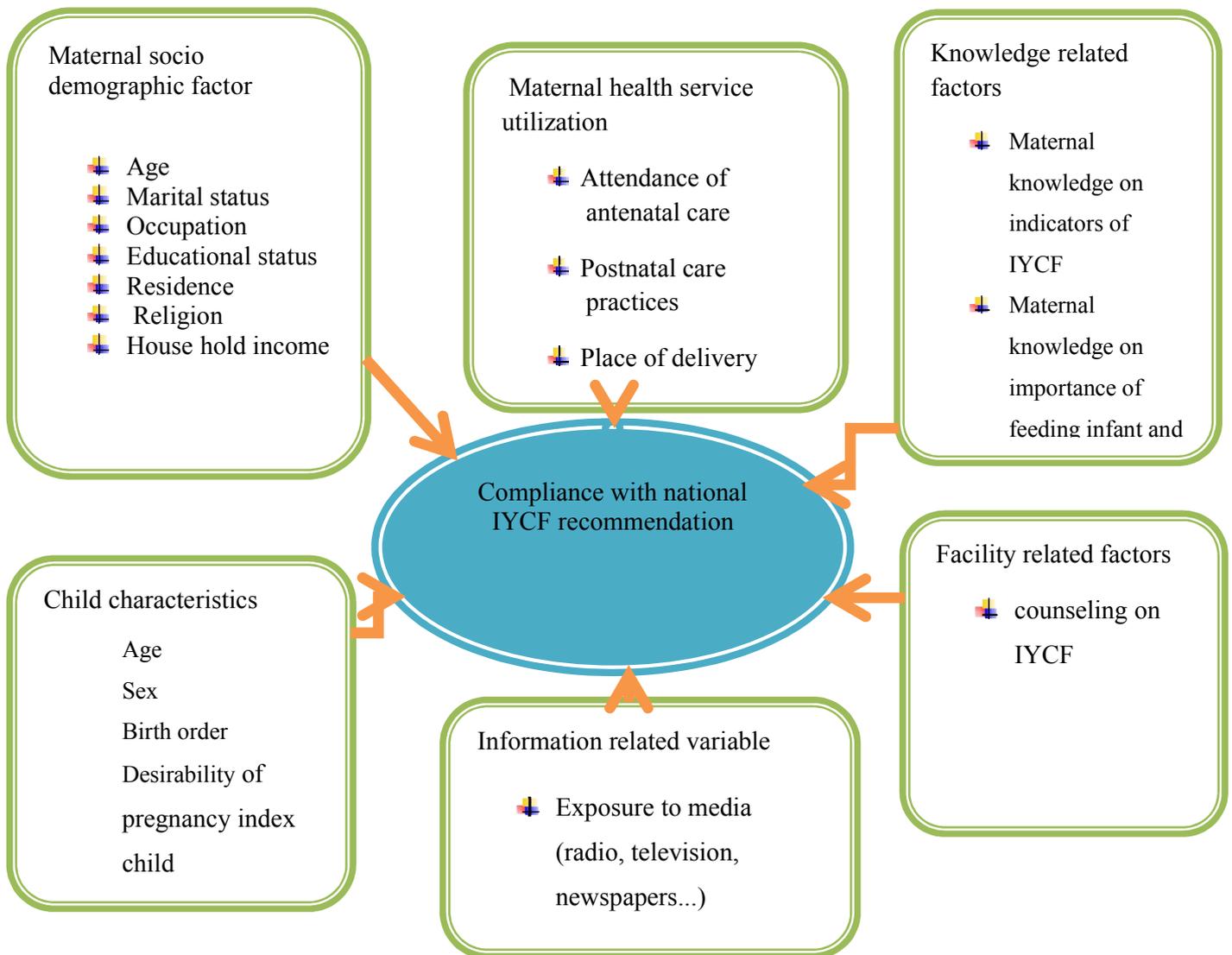


Figure 1: Conceptual framework after review different literature

## CHAPTER THREE: OBJECTIVES OF THE STUDY

### 3.1 General objective

- To assess compliance to national IYCF practices and associated factor among mothers of children 6-23 months of age in Gombora district, South Ethiopia, 2016.

### 3.2 Specific objectives

- To determine status of compliance to national IYCF recommendation among mothers of children 6-23 months of age.
- To identify the factors affecting compliance to national IYCF recommendation among mothers of children age 6-23 months.

## CHAPTER FOUR: METHODS AND MATERIALS

### 4.1 Study area and period

The study was conducted in Gombora district, from March 1 to March 30. One of the districts in Hadiya Zone, southern, Ethiopia. It is located 264km away from Addis Ababa, capital city and 221km from the regional capital town, Hawassa. The districts has 23 kebeles (one urban and 22 rural kebeles) with a total population of 114630(female= 58461 and male=56169) and annual estimated number of infant and young child in the district was 3.33 %( 114,630) =3817 [29].

More than 95% of the population is engaged in agriculture. Wheat, teff, maize, potatoes beans, ensete, root crops and dairy products etc are the main subsistence farming in the area. Most households are able to depend on their own crop consumption for 65-85% of their staples requirement and even the very poor produce half of their needs, relying heavily on working for others locally or elsewhere for cash income.

There are 23 health posts and 6 health centers, which provide routine growth monitoring and promotion or community based nutrition (CBN) and outpatient therapeutic program (OTP) services to the community.

## 4.2. Study design

Community based cross sectional, study design was used.

## 4.3 Population

### 4.3.1 *Source population*

All mothers children of age 6-23 months who reside in Gombora district.

### 4.3.2 *Study population*

All mothers children 6-23 months of age living in randomly selected kebeles.

### 4.3.3 *Study participants*

Mothers whose children 6-23 months of age selected for the study.

## 4.4 Inclusion and exclusion criteria

### 4.4.1 *Inclusion criteria*

Mothers having children 6-23 months of age who reside in Gombora district.

### 4.4.2 *Exclusion criteria*

Mothers children 6-23 months of age who reside in Gombora district and who  
Were very sick and unable to respond.

## 4.5 Sample size determination and sampling technique

### 4.5.1 Sample size determination

To determine the number of children age 6-23 months to be included in the study the single population proportion formula were used with the following assumptions: Since there were no previous studies which estimate mothers compliance with national IYCF recommendation in the area, a prevalence level that estimate maximum sample size (50%) were considered, marginal error (0.05), non-response rate of 10% or possible absenteeism and refusal to participate in the study, with 95% confidence level and alpha (0.05).Based on these assumptions the total samples size calculated using the formula indicated below gives 384 respondents.

$$n = \frac{\left( Z \frac{\alpha}{2} \right)^2 P(1-P)}{d^2}$$

The sample size is determined using single population proportion formula with the degrees of accuracy set at 0.05.

$$n = Z(\alpha/2)^2 pq/d^2$$

Where:

n- Sample size

Z-z value for the chosen confidence interval (usually 0.95  $\alpha=0.05=1.96$ )

P= 0.5, since there were no previous studies the status of compliance with national IYCF recommendation.

P taken as 50%

Non response rate = 10%

$$n = (1.96)^2 * (0.5 (1-0.5)) / (0.05)^2 + 10\% \text{ non-response rate}$$

$$n = 3.8416 * 0.25 / 0.0025 = 384$$

Since the number of estimated mothers having children age 6-23 months in the district i.e. source population (N = 3817) is less than 10,000, correction is needed as follows

$$nf = \frac{n}{1 + \frac{n}{N}} = \frac{384}{1 + \frac{384}{3817}} = 349$$

When a 10% non-response rate is considered, the total sample size is 384 mothers having children age 6-23 months.

#### 4.5.2 Sampling technique

The district was 22 rural and one urban kebele from which nine kebeles were selected using a lottery method. Proportional allocations were employed to obtain the sample size of the selected kebeles. Prior to the actual data collection, the list of study subjects were identified by using health management information system (HMIS) folder in the health post. Then those household numbers were picked up based on the existing house number in the HMIS folder. Finally, the study participants were selected by using random numbers generated by a computer program. The name and address of mothers having children age 6-23 months were specified and location were identified in collaboration with the kebele health extension workers and health development army.

The identified mothers were interviewed in each kebele till the numbers of sampled populations were completed. In some conditions like mothers away from home, the interviewers were re-visited the household at least three times and if it is failed to get the respondent, it was excluded from the survey and noted as non- response.

The 9 kebeles included in the study were: k1 =adeana, K2 =habicho k3 =sagie, k4= misa, k5 =1stole, k6= (m/gana, k7 =arare, k8= wondo and k9=bole

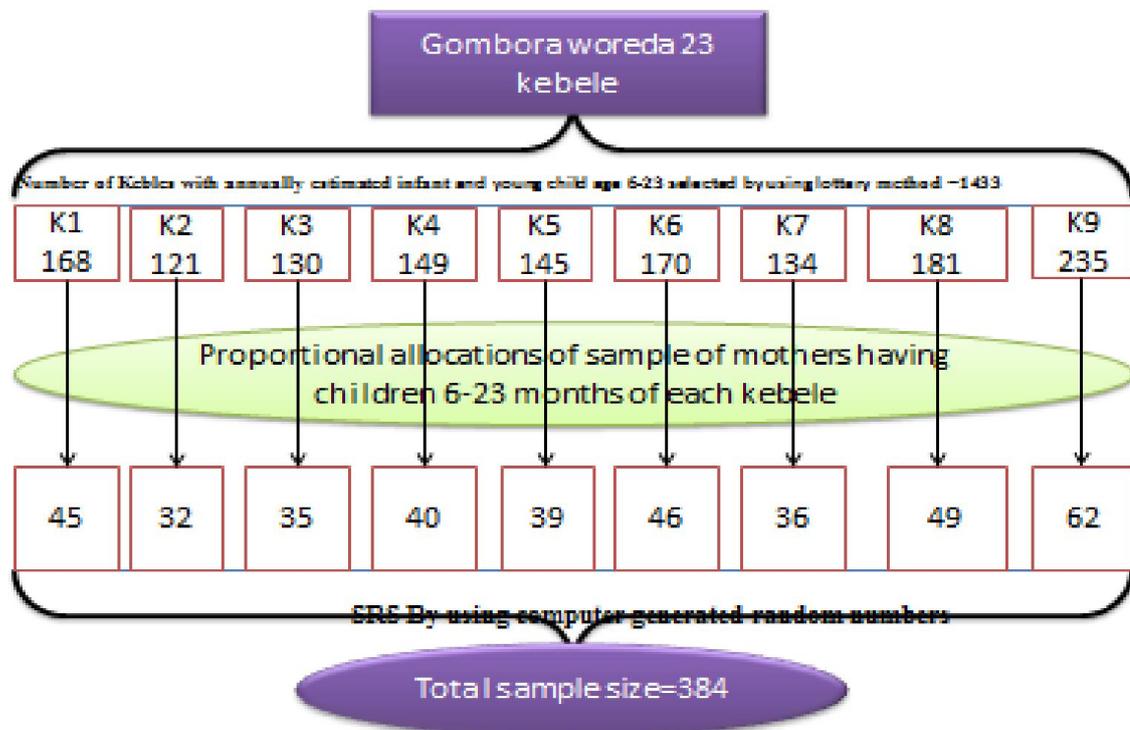


Figure 1: Schematic presentation of sampling procedure

## 4.6 variables

### 4.6.1 Dependent variable

Compliance with national IYCF recommendation

### 4.6.2 Independent variables

Socio-demographic related factor:-Age of mother, mother's ethnicity, mother's religion, marital status of the mother, mother's education status, household monthly income, residence

Child characteristics: - Age of child, sex of child, birth order of the child and desirability of pregnancy of index child

Maternal health service utilization related Factor:-antenatal care visit during pregnancy of index child, place of delivery (index child), and postnatal care visit (index child).

Facility related factors: - counseling on IYCF

Knowledge related factor:-Knowledge on indicators of IYCF and importance of feeding infant and young child.

Information related variable:-Exposure to media (radio, television...)

## 4.6 Data collection procedure

The data were collected using semi structured pre-tested interviewer administered questionnaire adapted from different literatures and modified according to the local context by addressing important variables and EDHS 2011. The questionnaire was prepared in English and then translated to local language Hadiyisa and back translated to English to maintain consistency by two different individuals who know local language well. The content of the questionnaire include: maternal socio-demographic related variables, child characteristics related variable, maternal health service utilization related variable, information related variable, knowledge on indicators and importance of IYCF related variable and facility related variable and outcome variable were assessed based on the administration of interview questionnaire adopted from the WHO questionnaire 24-hour recall food diversity [31].

## 4.7 Data quality assurance

To assure data quality, data collectors and supervisor trained for two days by principal investigator. The training include purpose of study, ethical issue, confidentiality how to collect

data, how to minimize recall bias by facilitating time of introduction of solid and semi-solid, dietary diversity and meal frequency in 24 hour period, how to approach the respondents to collect real data and minimize non-response rate and the data collectors and supervisors to have common understanding. 5% of the sample was pretested prior to actual data collection out of selected kebeles. Then necessary amendments were made upon identified ambiguities of the tools in the wording, logic and skipping order. The principal investigator and the supervisor carried out day to day on site supervision during the whole period of data collection. Completeness and consistency of the collected data checked on daily basis during data collection by supervisor and the principal investigator. Trained data collectors collected the data after explaining the objective of the study to each study participants. During data collection, study participants who were not present in residential area to respond were revisited at least three times. The data was coded and then entered into Epidata software.

#### 4.8 Operational and standard definitions

Compliant with IYCF recommendation: For this study a mother considered as compliant with IYCF recommendation if they fulfilled criteria of appropriate complementary feeding in preceding 24 hour recall of the survey which is equivalent to timely introduction solid and semi-solid with correct meal frequency (i.e. minimum 2 times for 6-8 months of child and 3 times for 9-23 months of child) and dietary diversity (minimum 4 food type from seven food group) in 24 hours as per recommended.

Non-Compliant with IYCF recommendation: Among the above expected indicators of appropriate complementary feeding if at least one indicators were not fulfilled during 24 hour dietary recall period.

Maternal knowledge on indicators of IYCF: in this study from total of eight dichotomized questions 1 for correct and 0 for incorrect answer about recommended indicators who answer median score above were taken as having knowledgeable.

Maternal knowledge on importance IYCF: Those respondents from total of five dichotomized questions, 1 for correct and 0 for incorrect answer about importance of IYCF who answer median score above were taken as having knowledgeable.

Household monthly income: Monthly income below 1205 ETB was considered as poor and above 1205 ETB was considered as rich based on World Bank International poverty line 2015(32).

#### 4.9 Data entry, processing and analysis

Data were entered into Epi data version 3.1 and then exported to SPSS version 20 for further analysis. Cleaning was made using frequencies. Descriptive statistics were used to describe the study variables. Then, binary logistic regression was used to examine the relationship between the proposed independent factors and dependent variable. Independent variables with P-value  $\leq 0.25$  with compliance in bivariate analysis were candidate variables and entered into multivariable logistic regression to control the possible effect of confounders among independent variables. The model fitness for variables was assessed by Hosmer-Lemeshow Goodness of fit test. Adjusted odds ratio and corresponding 95% confidence intervals will be used to quantify the degrees of association between independent variables and mothers compliance with national IYCF recommendation. Finally, results were presented in summary statics, text, graph and tables.

#### 4.10 Ethical consideration

Ethical clearance and approval for the study was obtained from the Ethical review board of Jimma University, College of Health Science. Permission was obtained from woreda health office. Then the woreda health office sent official letters to local authority of all kebeles. The research presents no more than minimal risk of harm to subjects. Verbal consent was obtained from the participant's mother after informing them all the purpose, benefit, risk, the confidentiality of the information and the voluntary nature of participation in the study. Participants found to have mal practices regarding their infant or young child feeding had been counseled after the completion of the interview.

#### 4.11 Dissemination of research finding

Findings of the study will be submitted to department of population and family health college of health science of Jimma University. It will also present to Jimma University. The dissemination also goes PHCU, Woreda Health office, Zonal Health Department and Stakeholders who are interested in maternal and child health related activities in Hadiya zone, publication will also be considered.

## CHAPTER FIVE: RESULT

From the total of 384 sampled mothers having children 6-23 months of age, 379 were interviewed with response rate of 98.6%.

### 5.1 Socio-demographic characteristics of mothers

The age range of mothers considered in the study was 15-49 years, which is a childbearing age range. The mean age was 27years (SD±5.28).The rural dwellers constituted the majority 350(92.3%).Concerning maternal education, 77(20.3%) had no formal education. Out of whom, 205(54.4%) and 97 (25.6%) have attended primary school and secondary school and above respectively. Majority of mothers 'occupation was housewives 362(95.5%).About 356(93.9%) respondents were protestant The predominant ethnic groups were hadiya which constitutes the larger proportion 365 (96.3%) and other 14(3.7%).Among the study subjects 376(99.2%) of the respondents were married. (Table 1)

Table 1: Socio demographic characteristics of mothers having children age 6-23 months in Gombora district, June 2016.

Socio-Demographic characteristics	Categories	Numbers	Percentage
Place of residence	Urban	29	7.7
	Rural	350	92.3
Mothers' age	15–19	5	1.3
	20–34	314	82.2
	35–49	60	15.7
Marital status	Married	376	99.2
	Widowed	1	0.3
	divorced	2	0.5
Religion	Protestant	356	93.9
	Orthodox	10	2.7
	Catholic	13	3.4
Educational status	No formal education	76	20
	primary (1–8)	216	57
	secondary(9–12) and above	87	23
Occupation	house wife	362	95.5
	government	13	3.4
	Merchant	4	1.1
Ethnicity	Hadiya	365	96.3
	Kembata	9	2.4
	alaba	2	0.5
	silte	3	0.8

## 5.2 Child, household and health care level characteristics

From sampled infant and young child about 207 (56.5%) were female. The mean age were 14 months (SD=4.641). Majority 222 (58.6%) of the sample the birth order were third and above and 271 (71.5%) desirability of pregnancy were planned. Regarding antenatal follow up about 149 (39.3%) respondents were followed four or more time and 140 (36.9%) received postnatal care visit. 339 (89.4%) of the mothers were gave birth the youngest child in health facilities. (Table 2)

Table 2: Child, household, health care level characteristics and source of information of mothers having children aged 6–23 months, Gombora district, June 2016.

Variables	Categories	Frequency	Percentage
<b>Child characteristics</b>			
Child's sex	Male	172	45.4
	Female	207	54.6
Child's age (in month)	6-11	105	28.3
	12-17	144	37.7
	18-23	130	34
Birth order index child	First to second	157	41.4
	Third and above	222	58.6
Desirability of pregnancy of index child	Planned	271	71.1
	Unplanned	108	28.5
Ever breast feed practiced	No	379	100
	Yes	0	0
<b>Household characteristics</b>			
No of <5 children	One	237	62.5
	Two	139	36.7
	Three and above	3	0.8
Exposure to media	Exposed	102	27
	Unexposed	277	73
House hold monthly income	Poor	328	86.5
	Rich	51	13.5
Sources of information on IYCF	Health professionals	237	62.5
	Relatives	23	6
	Friends	17	4.4
	Family (father)	12	3.1
	Media promotion	15	3.9
	No information	75	20.1
<b>Health care characteristics</b>			
No. ANC visit	< 4	230	61
	≥ 4	149	39
Place of delivery	Home	89	23.4
	Institution	290	76.6
No. PNC visit	Yes	140	37
	No	239	63

### 5.3 Facility related factors

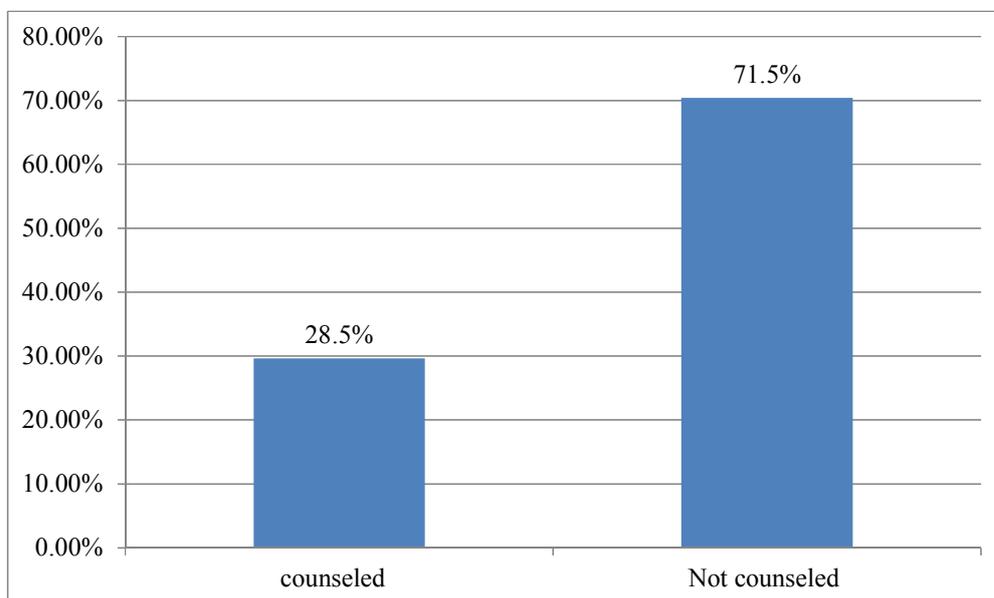


Figure3:Diagrammatic presentation of mothers having children of 6-23 months age counseled to IYCF in Gombora district, South Ethiopia, June 2016.

#### 5.4 Maternal knowledge on importance of feeding infant and young child and indicators IYCF

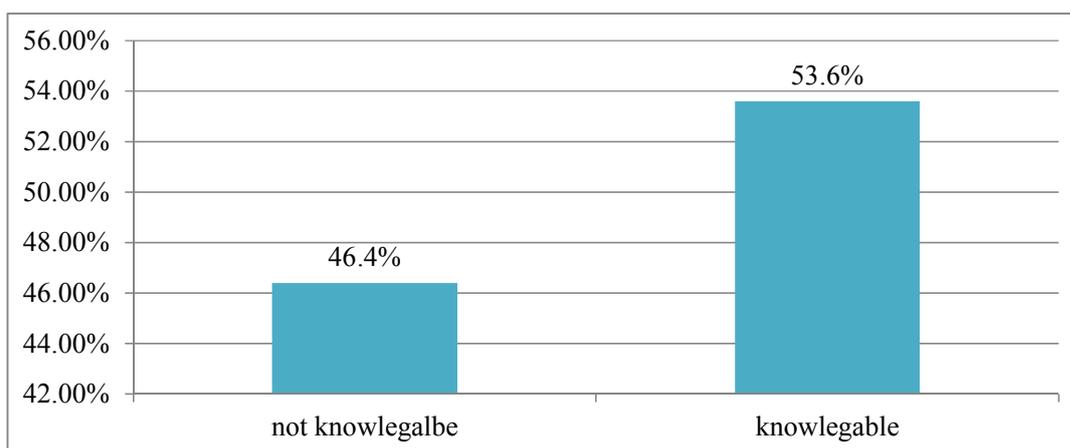


Figure 4: Mothers knowledge on importance IYCF in Gombora district, June 2016

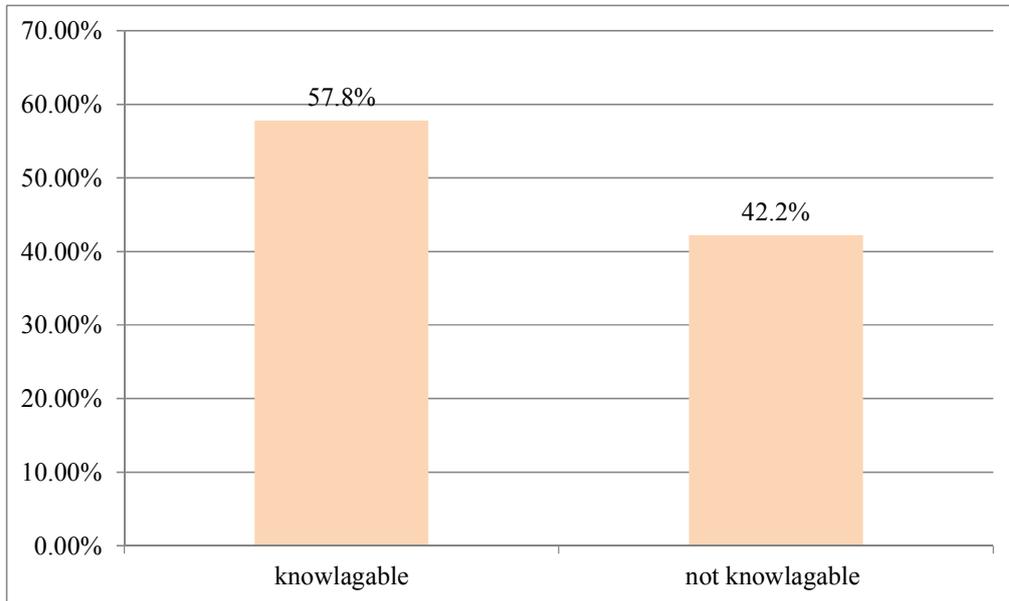


Figure 5: Mothers knowledge on indicators IYCF in Gombora district, June 2016

### 5.5 Complementary feeding practices

Regarding feeding practices about 286 (75.5%) mothers introduced complementary feeding as per recommended, 43(11.3%) mothers introduced early before 6 month, 45(11.9%) mothers initiated late after 6 months and 5(1.3%) mothers did not start complementary feeding at all. Accordingly 72 (19%) mothers offered four or more food groups to their child and Simiraly 213(56.2%) practice below the recommended minimum meal frequency. About 161(42.5%) mothers fed their children more than two times the day preceding 24 hour dietary recall period.

### 5.6 Types of food practices

Grain, roots and tubers were the most commonly taken food items by the children in 24 hours preceding the survey which constitute 362(95.5%), legumes and nuts 129(34%), dairy products 122(32.2%), vitamin-A rich foods 65 (17.2%). (Table 3)

Table 3 :-Types of food groups consumed by the children age 6-23 months in Gombora district, June 2016.

Food groups	Frequency (n)	Percentage (%)
1. Grains, roots and tubers	362	95.5
2. Legumes and nuts	129	34
3. Dairy products	122	32.2
4. Flesh food	0	0
5. Eggs	68	17.9
6. Vitamin A rich fruits and Vegetables	65	17.2
7. Other fruits and vegetables	6	1.6

### 5.7 Compliance with national IYCF recommendation

The result of this study revealed that 13.5 % ( 95% CI=10, 17.5) of the respondents compliant with IYCF recommendation in preceding 24 hour dietary recall period. About 86.5% mothers did not meet the national IYCF recommendation according to national IYCF guideline in 24 hour dietary recalls.

### 5.8 Reasons for non-compliance to IYCF recommendation

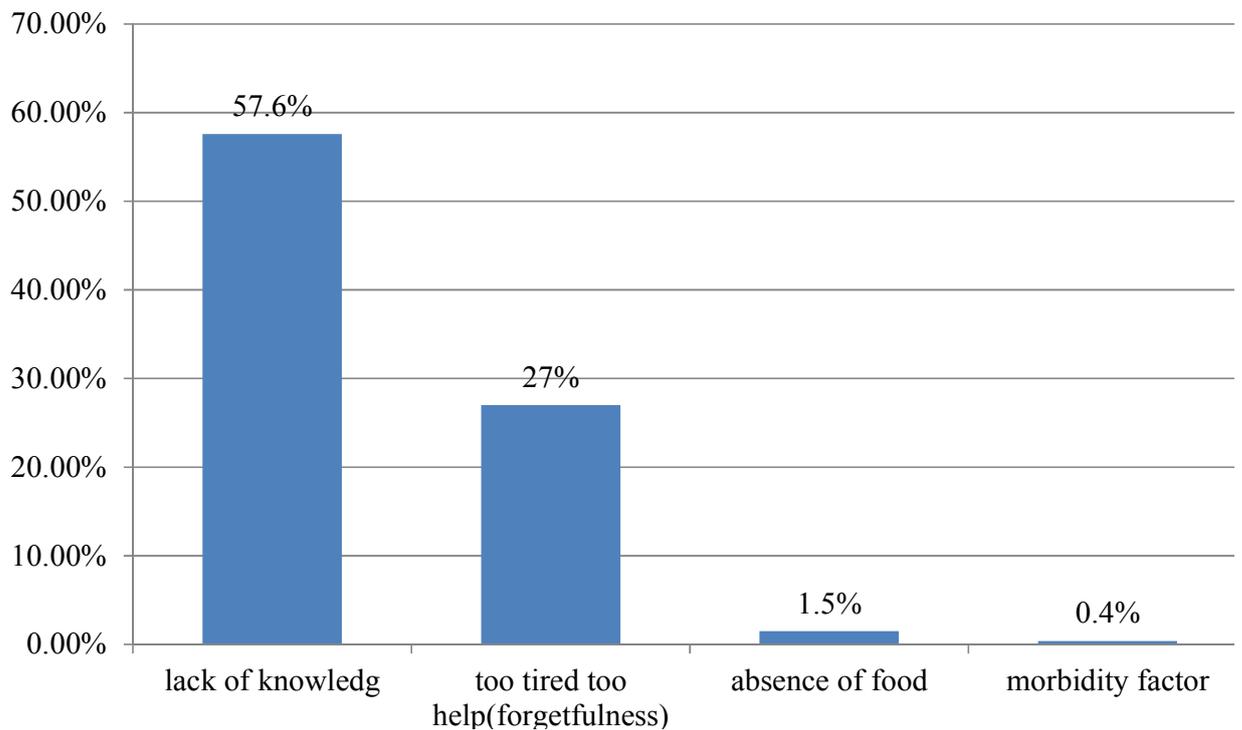


Figure 6. Reason for non-compliance to IYCF recommendation among mothers who had children of 6-23 months of age in Gombora district, June 2016.

## 5.9 Bivariate analysis factors associated with compliance to national IYCF

Bivariate logistic regression were done to analyze factors associated with compliance to IYCF; from maternal socio-demographic characteristics, age of mother and educational status, from maternal health service utilization related factor, antenatal care visit greater than or equal to four, postnatal care visit, from child characteristics, mothers of child age (18-23) months and desirability of pregnancy of index child and mothers knowledge on indicators IYCF and counseled on IYCF were the factors associated with compliance to IYCF.(p-value of  $\leq 0.25$  candidate for multivariable logistic regression).

Table 4 Bivariate logistic regression analysis on factors associated with compliance to national IYCF recommendation in Gombora district, June 2016.

Variables	Compliance with national IYCF recommendation		COR (95%CI)	p-value
	Non-compliant	compliant		
Age of mothers				< 0.001
<25	147(94.2%)	9(5.8%)	0.26(0.125, 0.560)	
$\geq 25$	181(81.2%)	42(18.8%)	1	
Educational status				< 0.001
No formal education	71(93.4%)	5(6.6%)	0.78(0.277,2.164)	
Primary (grades 1–8)	198(91.7%)	18(8.3%)	1	
Secondary(9-12) and above	59(67.8%)	28(32.2%)	5.22(2.669,10.097)	
Age of child (months)				< 0.001
6-11	98(93.3%)	7(6.7%)	1	
12-17	131(91%)	13(9%)	1.39(0.534,3.612)	
18 – 23	99(76.2%)	31(23.8%)	4.38(1.843,10.427 )	
Pregnancy child				0.15
Planned	227(83.8%)	44(16.5%)	1	
Unplanned	101(93.5%)	7(6.5%)	0.36(0.156, 0.821)	
No. ANC visit				< 0.001
$\geq 4$	116(77.9%)	33(22.1%)	3.35(1.807,6.212)	
<4	212(92.2%)	18(7.8%)	1	
PNC follow up				< 0.001
Yes	111(79.3%)	29(20.7%)	2.58(1.415,4.693)	
No	217(90.8%)	22(9.2%)	1	
Knowledge on indicators of IYCF				< 0.001
Not knowledgeable	152(95%)	8(5%)	0.13(0.098,0.472)	
Knowledgeable	176(80.4%)	43(19.6%)	1	
Counseling on IYCF				< 0.001
Yes	76(70.4%)	32(29.6%)	5.58(2.995,10.411)	
No	252(93%)	19(7%)	1	

## 5.10 Factors independently associated with compliance to national IYCF recommendation

The multivariable analysis maternal educational level secondary (9-12) and above, mothers of child age (18-23) months, mothers knowledge on indicators IYCF, frequency of antenatal visits more than or equal to four, postnatal care visit and counseling on IYCF showed that significantly associated with compliance to IYCF recommendation.

Table 5 Factors independently associated with compliance to national IYCF recommendation in Gombora district, South Ethiopia, June 2016.

Variables	Compliance with national IYCF recommendation		COR (95%CI)	AOR (95%CI)
	Non-compliant	compliant		
Age of mothers				
<25	147(94.2%)	9(5.8%)	0.26(0.125, 0.560)	0.433(0.160,1.172)
≥25	181(81.2%)	42(18.8%)	1	1
Educational status				
No formal education	71(93.4%)	5(6.6%)	0.78(0.277,2.164)	0.58(0.174,1.920)
Primary (grades 1–8)	198(91.7%)	18(8.3%)	1	<b>1</b>
Secondary(9-12) and	59(67.8%)	28(32.2%)	5.22(2.669,10.097)	<b>5.26(2.318,11.914)*</b>
Age of child (months)				
6-11	98(93.3%)	7(6.7%)	1	<b>1</b>
12-17	131(91%)	13(9%)	1.39(0.534,3.612)	0.77(0.245,4.085)
18 – 23	99(76.2%)	31(23.8%)	4.38(1.843,10.427 )	<b>3.88(1.641,9.162)*</b>
Pregnancy index child				
Planned	227(83.8%)	44(16.5%)	1	1
Unplanned	101(93.5%)	7(6.5%)	0.36(0.156, 0.821)	0.44(0.159,1.240)
No. ANC visit				
≥ 4	116(77.9%)	33(22.1%)	3.35(1.807,6.212)	<b>3.95(1.840,8.488)*</b>
<4	212(92.2%)	18(7.8%)	1	<b>1</b>
PNC visit				
Yes	111(79.3%)	29(20.7%)	2.58(1.415,4.693)	<b>2.97(1.389,6.349)*</b>
No	217(90.8%)	22(9.2%)	1	<b>1</b>
Knowledge on indicators of IYCF				
Not knowledgeable	152(95%)	8(5%)	0.13(0.098,0.472)	<b>0.19(0.075 , 0.465)*</b>
Knowledgeable	176(80.4%)	43(19.6%)	1	<b>1</b>
Counseled on IYCF				
Yes	76(70.4%)	32(29.6%)	5.58(2.995,10.411)	<b>6.02(2.786,12.998)*</b>
No	252(93%)	19(7%)	1	<b>1</b>

\*Statistically significant at  $p < 0.05$  after being adjusted for other variables, 1 = reference.

The multivariable analysis revealed that, the odds of being compliant to national IYCF was 5.26 times as much for those mothers educational level secondary(9-12) and above as compared to those mother who had primary education (1-8) (AOR=5.26[95%CI=2.318,11.914]). Similarly the odds of being compliant to national IYCF recommendation was 3.88 times as much for mothers of children within the age group (18-23) months as compared to mothers of infants in the age group (6-11) months(AOR=3.88[95%CI=1.641,9.162]). The odds being non-compliant to national IYCF recommendation was 81% times among those not knowledgeable on indicators of IYCF than those mothers having knowledgeable(AOR=0.19[95% CI=0.075,0.465]). The odds of being compliant to national IYCF recommendation was 3.95 times as much for mother who had visited antenatal four times and above as compared to mothers who visited antenatal less than four times visit(AOR=3.95 [95%CI=1.840,8.488])and accordingly, the odds of being compliant to national IYCF recommendation was 2.97 times as much for mothers who had visited postnatal care visit as compared to mothers who had no postnatal care visit (AOR=2.97 [95%CI=1.318, 6.349]). The odds of being compliant to national IYCF recommendation was 6.02 times as much for mothers who had counseled on IYCF as compared to mothers who had no counseled on IYCF (AOR=6.02 [95%CI= 2.786,12.998]).

## CHAPTER SIX: DISCUSSION:

Community based cross sectional studies determined compliance to national IYCF recommendation and associated factors among mothers having children in Gombora district of southern Ethiopia. The result of this study revealed that 13.5 % (95%CI=10, 17.5) of the respondents compliant with IYCF recommendation and about 86.5% mothers did not meet the national IYCF recommendation for the appropriate complementary feeding according to IYCF guideline.

In this study one factor shown to be associated with compliance to national IYCF recommendation was mothers' educational status. The odds of being compliant to IYCF recommendation was 5.26 times as much for those mothers educational level secondary(9-12) and above compared to those mother who had primary education (1-8) (AOR=5.26 (95%CI=2.318, 11.914)).

This result was in agreement with the findings from Sirlanka, Nepal and Tanzania (19, 20, 24) This could be because of educated mothers were more likely to have information and understand the education message.

Another variable shown to have a significant association with the compliance to national recommendation IYCF was found to be postnatal care visit. The odds of being compliant to national IYCF recommendation was 2.97 times as much for mothers who had visited postnatal care as compared to mothers who had no postnatal care visit (AOR=2.97 (95%CI=1.318, 6.349)).

This result was in agreement with the findings in Tanzania that showed postnatal care visit was significantly associated with compliance to national IYCF recommendation (25).

This could be mothers received counseling from health workers during their postnatal visits.

Similarly, visiting antenatal four and more times was to have significant effects on mother's compliance with national IYCF recommendation.

The odds of being compliant to national IYCF recommendation was 3.95 times as much for mother who had visited antenatal four times and above as compared to mothers who visited antenatal less than four time visit (AOR=3.95 (95%CI=1.840, 8.488))

This finding was similar with northern Ghana (22).

The possible reason of this is that health care providers may educate mothers during their antenatal visits.

Another variable which was associated with compliance to national IYCF recommendation were mothers of children within the age group (18-23) months. The odds of compliant to the IYCF recommendation was 3.88 times as much for mothers of children within the age group (18-23) months as compared to mothers of infants in the age group 6-11 months (AOR=3.88 (95%CI=1.641, 9.162)).

This result was in similar with the findings in Nepal and Ghana, show that mothers of children within the age group (18-23) months significantly associated with compliance with national IYCF recommendation(20,22).This could be some mothers couldn't introduce complementary feeding at six month.

Accordingly, another variable shown to have a significant association with compliance to IYCF recommendation was mother's knowledge on indicator IYCF. The odds being non-compliant was 81% times among those not knowledgeable on indicators IYCF than those knowledgeable on indicators IYCF (AOR=0.19 (95%CI=0.075, 0.47)).

This finding was in agreement with study done in Udipi district of India and Bangladesh (27, 28).The reason could be that knowledge helps mothers to have a good perception of prevention and treatment of malnutrition during infancy and early childhood.

In this study, other factor shown to have a significant association with the compliance with national IYCF recommendation was counseling on IYCF. The odds of complying to national IYCF recommendation was 6.02 times as much for mothers who had counseled on IYCF as compared to mothers who had no counseled on IYCF (AOR=6.02 (95%CI= 2.786, 12.998)).

This finding was in agreement with the study done in Kenya (23).

#### Strength and limitations of study:

Even though, there is lack of adequate literatures in our country; this study had identified the level of compliance with comprising timing, dietary variety and meal frequency WHO IYCF recommendation for appropriate complementary feeding as a strength which can be information base line in the study area. The limitation of this study was data collected based on interviews and rely on the memory of mothers, there is possibility of recall bias, since it considers only 24h (twenty four hour) feed, it may not accurately reflect their past feeding experience and socially desirable response. It does not take into account of the quality and amount of food provided.

## CHAPTER SEVEN: CONCLUSION AND RECOMMENDATIONS

### 7.1 Conclusion

Compliance to national IYCF recommendation was low in the area compared with other countries. About 86.5% mothers did not meet the recommendation for the appropriate complementary feeding according to national IYCF guideline. It was found that secondary level maternal education (9-12) and above, mothers of child ages (18-23) months, greater than or equal to four antenatal visits, postnatal care visit, and mothers' knowledge on indicators of IYCF and counseling on IYCF were factors that can increase compliance to IYCF.

### 7.2 Recommendation

Based on the study findings the following recommendations are forwarded

To woreda health office:-

- Mothers who were completed only primary education need more attention.
- Mothers having children of (6–11) month old should give special attention to designing nutrition education programs.
- Lack of knowledge on indicators of IYCF is an important factor responsible for low compliance; strengthen monitoring and evaluation system regarding knowledge assessment.
- Strengthen counseling services in health facilities at relevant maternal and child health contacts in primary health care services.

To health professionals at health facility:-

- Maternal and child health service outlets should be used to transmit child feeding information it is important to educate mothers during every contact opportunity.
- Promoting mothers to visit antenatal at least four times.

For researchers:-

- Further research is recommended on compliance with the IYCF recommendation using actual feeding practices to overcome the limitation of this study.

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## ANNEXES

### ANNEX 1. QUESTIONNAIRE: ENGLISH VERSION

Informed Consent: For House to House Survey on factors influencing compliance with recommended national IYCF practices among mothers having children aged 6-23 months in Gombora district, South Ethiopia, 2016

Dear Sir;

Hello, my name is \_\_\_\_\_ I am working in a research team of Jimma University. This questionnaire is prepared to conduct a study on factors influencing compliance to recommended national IYCF practices among mothers having children aged 6-23 months in this area. You are selected and included in the study as part of the sample population to complete the questionnaire designed by the researcher.

Thus this interview is prepared for this purpose to get appropriate information on the study we are conducting. The information that i will obtain using this interview will be used only for research purpose and none of your answers will be available to anyone. Your response will be kept confidential. For this purpose your name will not be written here and there will be no way of linking your individual responses to the final result of the study findings. The study has no risk to you and your family members except mild time consuming .Therefore I politely request your cooperation to participate in this interview. You do have the right not to respond at all or to withdraw in the meantime, but your input has great value for the success of my objective

Do you agree to participate in this study?

Yes ----- continue

No-----thank you!

Name of the data collector \_\_\_\_\_ Sign \_\_\_\_\_ Date \_\_\_\_\_

Questionnaire code \_\_\_\_\_

Enumerator's ID number \_\_\_\_\_ House number \_\_\_\_\_

**PART ONE: SOCIO-DEMOGRAPHIC CHARACTERISTICS OF MOTHERS WITH THEIR INDEX CHILD (AGE 6-23 MONTHS)**

S.n	Questions	Response	Code
101	Age	_____ Years	
102	Marital status	1- Single 2- Married 3- Divorced 4- Widowed 5- Separated	
103	Number of children less than five	_____	
104	Educational status	1.No formal education 2.Primary cycle(1-8) 3.Secondary and above	
105	Employment	1. Government 2. Merchant 3. Farmer 4. House wife 5. Other (specify)_____	
106	Religion	1. Orthodox 2. Muslim 3. Protestant 4. Catholic 5. Others (specify)_____	
107	Ethnicity	1.Hadiya 2.Kembata 3.Silte 4.Gurage 5.Others _____	
108	Place of residence	1. Urban 2. Rural	

109	House hold monthly income	_____ETbirr	
<b>PART TWO: CHILD RELATED VARIABLE</b>			
201	Child's sex	1. Male 2. Female	
202	Child's age	_____ Months	
203	Birth order	1. 1st 2. 2nd 3. 3rd 4. 4th 5. $\geq 5^{\text{th}}$	
204	Age of immediate older sibling	_____ in years	
205	Desirability of pregnancy of index child	1.Planned 2.Unplanned	
206	Is this child breast feed currently?	1. Yes 2. No	
<b>PART THREE:COMPLEMENTARY FOOD RELATED FACTORS</b>			
301	Child had any episode of the following conditions or since introduction of complementary feeds?	1. Yes 2. No	If no skip Q 401
302	If yes? What illnesses?	1.Diarrhea 2.Dermatitis 3.Pneumonia 4.Others (specify_____)	
303	Have you ever stopped complementary food has the infant /child had any episode of the following conditions or since introduction of complementary feeds?	1.Yes 2.No	
<b>PART FOUR: MATERNAL HEALTH SERVICE UTILIZATION RELATED FACTOR</b>			
401	Did you visit health facility for ANC during your pregnancy for this child?	1.Yes 2.No	If no skip Q 404

402	If yes how many times did you receive (number of antenatal care) during your time of pregnancy for this child?	1.One 2.Two 3.Three 4.More than four	
403	Did you get health education on child nutrition at any of your visit?	1. Yes 2. No	
404	Where did you gave birth to this child/Place of delivery	1. Home 2. Health Center 3. Hospital 4. Other (specify) ____	
405	Do you receive PNC for this child?	1. Yes 2. No	If no skip Q 501
406	How many times you visited the health for PNC?	1. Within six hour, day and weeks 2. Within six day and weeks 3. Within six weeks	
<b>PART FIVE FACILITY RELATED FACTORS</b>			
501	Did you receive advice/ counseling on child nutrition at services in health facilities	1. Yes 2. No	
<b>PART SIX: INFORMATION RELATED VARIABLE</b>			
601	Did you have any information on complementary feeding before the birth of this child?	1. Yes 2. No	If no skip 603
602	What was the source this information?	1. Health care providers 2. Previous experience 3. Relatives 4. Friends and neighbors 5. Media (radio, tv, newspapers etc 6. Other (Specify)____	

603	After the birth of your child, what was your primary source of information on complementary feeding?	<ol style="list-style-type: none"> <li>1. Health care providers</li> <li>2. Previous experience</li> <li>3. Relatives</li> <li>4. Friends and neighbors</li> <li>5. Media (radio, TV, newspapers)</li> <li>6. other Specify)_____</li> </ol>	
604	Does feed your child according to national IYCF recommendation?	<ol style="list-style-type: none"> <li>1. Yes</li> <li>2. No</li> </ol>	If yes skip Q 606
605	If no, why not?	<ol style="list-style-type: none"> <li>1. Cultural reasons</li> <li>2. Too tired to help</li> <li>3. Lacks knowledge</li> <li>4. Mordity factor</li> <li>5. Absence of food</li> <li>6. Other (Specify</li> </ol>	
606	Whom do you regularly consult on feeding your child?	<ol style="list-style-type: none"> <li>1. Partner/ Father</li> <li>2. Relative</li> <li>3. Experienced friend/ Neighbors</li> <li>4. Health workers</li> <li>5. HEWs</li> <li>6. (Specify)___</li> </ol>	
<b>PART SEVEN: KNOWLEDGE RELATED FACTOR</b>			
<b>7.1 Knowledge assessment on importance complementary food</b>			
I am going to read out some statements. For each statement, please tell me whether you think it is correct or not.(code 1,for correct answer,0,incorrect)			
701	Appropriately feeding your child is important to physical growth?	<ol style="list-style-type: none"> <li>1. correct</li> <li>2. incorrect</li> </ol>	
702	Appropriately feeding your child is important for mental growth?	<ol style="list-style-type: none"> <li>1.correct</li> <li>2.incorrect</li> </ol>	
703	Appropriately feeding your child is important to protect from malnutrition?	<ol style="list-style-type: none"> <li>1. correct</li> <li>2. incorrect</li> </ol>	
704	Inappropriate feeding during infancy and early childhood can cause under nutrition	<ol style="list-style-type: none"> <li>1. correct</li> <li>2. incorrect</li> </ol>	

705	Inappropriate feeding during infancy and early childhood can be consequences for child morbidity and mortality	1. correct 2. incorrect	
7.2 knowledge assessment on IYCF indicators			
I am going to read out some statements. For each statement, please tell me whether you think it is correct or not.			
706	What is the recommended time to introduce solids, semi-Solid?	1. correct 2. incorrect	
707	Up to what age should the infant continue breastfeeding after introduction of other foods?	1. correct 2. incorrect	
708	How often should a breast fed baby be given solid, Semi-solids for age 6-8 months in a day?	1. correct 2. incorrect	
709	How often should a breast fed baby be given solid, Semi-solids or soft foods for 9-23 months in a day?	1. correct 2. incorrect	
710	How often should a non-breast fed baby be given solid, Semi-solids for 9-23 months in a day	1. correct 2. incorrect	
711	At what age should a baby Receive food from the family Pot?	1 correct 2 incorrect	
712	What should an infant's diet consist of?	1. correct 2. incorrect	
713	What is minimum recommended an infant's diet consist of mentioned above?	1. correct 2. incorrect	
<b>PART EIGHT: PREVIOUS PRACTICE ( FILL SECTION WHERE APPLICABLE)</b>			
801	Did you introduce food the immediately older sibling of the index child to other foods?	1 yes 2 no	If no skip to 901
802	After introduction of other foods to this child growth progress change?	1.yes 2.no	
<b>PART NINE: ABOUT COMPLIANCE WITH RECOMMENDATION</b>			
<b>24 HOUR DIETARY RECALL</b>			
Probe [name] child ate yesterday during the day or night (whether at home or outside the home).			

1.1 About introduction of solid and semi-solid			
901	At what age did start solid and semi-solid foods for this child?	1.at 6 months 2.before 6 month's 3.late after 6 months(after 8 months) 4 not at all	→ 902
24 Hour dietary recall. Yesterday during the day or at night .....			
902. Kindly probe the mother about what (name) ate yesterday during the day or at night. Probe about what (name) ate on waking up, till mothers says nothing else. Probe, what else did (name) eat after that, keeping on probing till mother says (name) went to sleep until the next day. If mother mentions mixed foods like porridge, probe on the ingredients of the dish. Fill the mentioned food in appropriate spaces provided below in table. list of food group mentioned below list of 7 food groups			
	What did (name) eat yesterday during the day or night?	Enter code:	
Did (Name) eat Any solid, semi-solid or soft food yesterday during the day or night?  Enter code  1.Yes  2.No	1) Grains, roots and tubers; Bread, rice, millet or other grain based porridge? Root based foods: White potatoes, white yams, cassava, or any other foods made from roots? Root based foods: White potatoes, white yams, cassava, or any other foods made from roots?	1.yes 2.no	
	2) legumes and nuts;based foods: beans, peas, lentils or nuts	1.yes 2.no	
	3) Dairy products; Fermented milk, yogurt, or other milk products?	1.yes 2.no	
	4) vitamin A rich fruits and vegetables; Ripe mangoes, ripe papayas, oranges	1.yes 2.no	
	5) eggs	1.yes 2.no	
	6) Flesh foods; meat such as goat, chicken, Liver, kidney, heart or other organ meats	1.yes 2.no	
	7) Other fruits and Vegetables?	1.yes 2.no	
	1.yes (if the child had consumed at least four or more groups of foods) 0.no (If less than at least four foods from the seven food groups in past 24-hour time period)		
24 hour dietary recall continued  Yesterday during the day or at night .....			

903	How many times did (name) eat solids, semi- Solid or soft foods other than liquids?		
	1.Once 2.Twice and above	4. 4 times 5. 5 times	1.yes 2.no
	1. yes if infants of 6–8 month feed two or more times or if 9–23 months infants feed three and more times in 24 hours 0. No (if child feed less than above recommended criteria)		
904	Overall compliance with IYCF 1.Yes (if fulfilled the above 3 indicators ) 0. No (if mother misses one of the above indicators)		

## ANNEX 2. QUESTIONNAIRE: HADIYISA VERSION

Jimmi yuniverisitee: minaadabina fayyaa'ooma egechchi losa'nni mineenne la'mmi digiire'e maassi kitaaba gudiissimmina wixa'aakami naqaasha wixxaachina eeyyii'xi sagara uwwoo manna siidimina gudaakkoo gudushsha

Lophphitaattoo ayyichche:

Summi iikki \_\_\_\_\_ yamaamookko. Ku xa'mmichchi qoodamaakoo ciilluwwi exxo'i hurbaaxxi bikkinaa, ixenne amaxxaamoo luwwaanne yookki naqaasha wixaa'imina guudakkoo xa'immichha. Eebikina ka horoori woshshane gudikki xaa'michcha dabarimmine naqaasha uwwiito'sina ati dao'llaantaatto.

Ka xaa'michchuwika hundami ihukko kolidabacha dabarima urrimi xaansiisoothane ihukarrem ati ka xaa'michina uwwiitoo naqaashi danaami misha eebimina araaqa awwaadohane ihookko.

Xaa'michcha dabarimina iitaantoo?

Eeyya

Asheere

aa'ee

Galaaxxoommo!

Naqaasha wixaa'anchi

summa \_\_\_\_\_ furmma'a \_\_\_\_\_ ayyaamo \_\_\_\_\_

Xammichchi bikko'o (coodda) \_\_\_\_\_ mi'nni xigo \_\_\_\_\_

**BAXXANCHCHI MATO: MINAADAPHI HEECHCHI OGORAA GATTI QANQUUWWAA 6-23  
CILUWWI UMMU'LLI LAMBE'ENNE MAQIIRE YO'O AMO'O EXXO'I HUURBAAXXI  
BIKKINA XA'IMMAKKAMI XA'IMMICHCHA**

Xig	Xa'immichha	Dabachcha	Bikko'o
101	Umuri mee'oo?	_____Hiinchcho	
102	Mine issimmi duhaa'i?	1- Mine issuumoyyo 2- Mine issaammo 3- Annaani ihaammo 4- Manchi lehakko 5- anni ann ikkaamoo 6- Muullekki_____	
103	Mi'nni abaroossi xigi mee'oo?	_____	
104	Losa'nni duuha'i?	1. Horeem losuummoyyo 2. Lu'xxi gabala(5-8) 3. La'mmigabala(9-12) hanaan	
105	Baxi?	1. Adii'li baxaanchotte 2. Dadaraanchotte 3. Abullaanchotte 4. Mi'nni amatte 5. Muullekiyoollas kure_____	
106	Ammanatti?	1. Orthodoxichchote 2. Musiilimichchote 3. Ammanaachchoote 4. Catholiikiichchote 5. Mullekki yoollassii_____	
107	Shuummo'i	1. Hadiiyiichchote 2. Kambaatiichchote 3. Sillitekkiichchote 4. Guuragekiichchote 5. Muullekiyoollassi_____	
108	Heechi beyyi	1. Beero'o 2. Haxxi uulla	
109.	Mat agaananne hinkaanni aago'i hee'oo? .....Ethio.Biraa		

<b>BAXXANCH LAMO : CILLIICHCHINNE AMAXAKOO LUWWA</b>			
201	Ciilichik albch marucho	1 gooncho 2 landichote	
202	Ciilik uumur mee'o	_____ agana	
203	Qaranchchi ogoraa maruuchcho	1. luxxane 2. lammane 3. saxxane 4.soollane 5. onttane	
204	kaciilichchii lobaanic ummur me,oo	_____ aagana	
205	Kacciilichchik Qaranch duuhai	1 qoodamaakooissinnete 2.qoodammoonnete	
206	Anunaa iccimi duhaa	1 iccokolla 2.iccoyoo	
<b>BAXANCHCHI SASO ;HURBAATINNE AMAXAAMOO LUWWA</b>			
301	Ku ciilichi hurbaata jamraa lasage kanninne amaxammakoo xiis heekonniyee	1 Eeyya 2.aa,eee	aa,ee yitakoollas xig 401hige
302	Hinka xiissi heeukko	1.aaditee 2.kuxiisoo jaboo 3.qoodaa jaboo 4 muullekkii	
303	huurbaata uuliissa heellitoo	1 eeyya 2 aae	
<b>BAXXANCHI SORO:AMO'I FAYA'OM BIKINNE AMXAMAAKOO LUWWA</b>			
401	Kaciilichchi lamfoollamane faya'oom bikina faya'om mine matameliitone	1 eeyya 2 aa'ee	aa'ee yiitoollas xammichchi1 404 hige
402	Eeyyaa yitillassi,mee'ii kore dabalata	1.mattaa 2.lammaa 3.sassaa 4.soori korii lobookka	
403	Ka daballanchchane ciilluwwa hurbaaxxi bikina soogiitanoo uuwamaa hee'ukoo	1 eeyya 2 aa'ee	
404	Ku Ciilichchi qaraammu beyyi hannoo	1 minee 2.xeenaa xaabaa 3.hosibitaala 4.muullekkii	
405	Kaciilichchi iiraannaannonne faya,om bikiina faya,oom mine dabalataa heellitoo	1 eeyya 2 aa'ee	aa'ee yiitoollas xammichchi1 501 hige
406	Eyya yitilasee meei koree?	1. 6 saaxi woronee 2. 6 balii worone 3. 6 saniti worone	
<b>BAXXANCHI ONTO: FAYAOMI MININE AMAXAMAKO LUWWAA</b>			
501	Ka cillichchi bikina huribata	1.eeyya	

	sogitano fayaomi mine lossisaka heakoonhe?	2.aa,ee	
502	Sooggitanni shotoi hanno	1.hakiimiisee 2.mii'nni annii 3.qarimmanii 4.oollamanii 5.raadoonii 6.muulleekii	
503	Ciillichchi qarama lasg hurbaxxi Sooggitanni shotoi hanno	1.hakiimiisee 2.miinni annii 3.qarimmanii 5.oollamanii 5.raadoonii	
<b>BAXXANCHI LOHO ;SOOGIITANNO</b>			
601	Ku ciilliichchi qaramenna illage soogiitanoo hurbaaxxi bikkinna heekonniyee	1 eyyaa 2 aa'ee	aa'ee yitlass xiig 603 hiigge
602	Eeyyaa yiitillass,hinika beeyyii	1.hakiimiisee 2.mii'nni annii 3.qarimmanii 4.oollamanii 5.raadoonii 6.muulleekii	
603.	Ku ciilliichchi qaramaa lassagee soogiitanoo hurbaaxxi bikina heekonniyee Eeyyaa yiitillass ayyi ayye	1.hakiimiisee 2.miinni annii 3.qarimmanii 5.oollamanii 5.raadoonii	
604	kaciilliichchi hurbaaxxi bikkinaa balli hundaa soogitanninne haramoo mmani heeukoo	1 eyyaa 2 aa'ee	aa'ee yitlass xiig 606 hiigge
605	aa'ee yiitillass ,mahiinaa	1.bahiilinee amaxamaakoo luwwii yoo biikkinna 2.loobakhta hoogaamma haramoo manni bee'I bikkinna 3.lachcha hoogaamma 4. xiissi mashshikainne 5. hurbaat beechchine 6.muulleekii_	
606		1Qarimanii / mi'nni anni 2.illageenii lachiinse 3.qarimmanii 4.oollamanii 5.raadoonii maceessumaanii 6.muulleekii	
<b>BAXXANCHI LAMMARA; GAAGII LACHCHINEE AMAXXAMMAAKOO LUWWA</b>			
7.1.Ciilluwwa hurbaatiinne ammaxxamaakoo lachcha kuuroo xammichcha			

701	Ciilluwwi hurbaatti orachchi liiniinna awadoo	1. hanqa 2. qophphano	
702	Ciilluwii hurbaatti horoolli linninna awwadoo	1. hanqa 2. qophphano	
703	Ciilluwwi, hurbaaxi jabbo hoorimina awaaddoo	1. hanqa 2. qophphano	
704	Dannammi hurbaata siiddubee'ii cillichchi,hurbaaxihofenii jaboo hoorimina amadamoo	1. hanqa 2. qophphano	
705	.Dannammi hurbaata siiddu bee'i cillichchi,hurbaaxxi hoffechi lehiina afiisoo	1. hanqa 2. qophphano	
7.2. Gaagii lachchinee amaxxammaakoo luwwa			
Ciilluwwi hurbaata asheerakammi ama'n lachchaa kuuroo xammiichcha			
706	Ciilliichchi hinka'i uummuranne afoo ammane luxxii hurbaata asheerakamda'i laqqoo	1. hanqa 2. qophphano	
707	Ciilliichchi hurbaata ashsheeraa lasage ammi anuuuna icciimmi hassiisoo hinkamman affeebeda'ee laqqoo	1. hanqa 2. qophphano	
708	Mati ballanne ciillichchi 6-8 uummuranne hinkaan hurbaata itimmi hasisoo	1. hanqa 2. qophphano	
709	Mati ballanne ciillichchi 9- 23 uummuranne hinkaan hurbaata itimmi hasisoo	1. hanqa 2. qophphano	
710	Mati ballanne annuuna iccobei ciilichi 9- 23 uummuranne hinkaan hurbaata itimmi hasisoo	1. hanqa 2. qophphano	
711	Mati ciillichchi minni ma'nni hurbaatannee exximmi hassiisoo hinkaan uummuuranne	1. hanqa 2. qophphano	
712	Annann hurbaaxxi hagar mah amdo	1. hanqa 2. qophphano	
713	Hoffe,u beyonne ka hurbaaxi	1. hanqa	

	hagar mah amdo	2. qophphano	
<b>BAXXANCH SADDEENTO KANNI ILLAQII LACHCHAA KUUROO XAMMICHCHA</b>			
801	Ka ciillichchi illaqa ciillichchi hurbaata hinkiammanne jammara heeukoo	1 eeyyaa 2.aa;ee	Aa'ee xaimmichchi 901
802	Ku ciillichchi hurbaata jammaraa lassagee guurimmi annannati hinkiidette	1 eeyyaa 2.aa;ee	
<b>BAXXANCHI HONSSO; QOODAMMAKOISSANNE CIILLICHCHINNA ANNANN HUURBAATA MATI BALLANNE MATI AMMA UUWEITAMISSA MOOAKKAM BAXXANCHCHA KUUROO XAIMMICHCHA, (24 SAAXXI WOROONE IITISSO HURIBATA)</b>			
1.1. Qoodamaakoissinne hurbaata exxo'i' jamarakkammi ammane moisoo ammane			
901	Ka ciilliichchina luxxi exxo'i hurbaata hinka uumuurane ashsheetiito	1.uummur 6 agana ihukkiisam 2.6 aggani woroone 3. 6 aganni hanani 4.laumoyyo	
24 saaxxi xammichchaa, beeballi himoo daraa.....			
902.	Eeyyaa yitillaas cillichchi balla, hiimmoo innissee affeebbee maahaa maaha ittuudai Kuutoo? ittuu lichchi mooqii ihuullass maahi hammaaramma yooddaii kuutoo		
Bebali kii cillichchi himmo balla maha itudae kotto? Woroli marree 1 eeyya 2 aee.e		1. .annann xiraa xiree hagaraa,luguumoo,diinnichcho, ( mooqii ihulassi moqi woronee mahi annani anani huribati hamaramadee kure)	1 eeyya 2 aee.e
		2. annannbaaqellaasiire'ee, giitee'ee, plampnetta	1 eeyya 2 aee.e
		3. saayyii luuwaa,addoo,saallallo,buurro o,	1 eeyya 2 aee.e
		4. vaataammiinii A, annanni duubbi hurbaata	1 eeyya 2 aee.e
		5. quunqaa	1 eeyya 2 aee.e
		6. aassaa,hurbbaata,woodaanno o,assmmaa maaraa, gookiisaakoi eeissaamm fella maaraa	1 eeyya 2 aee.e
		7. muullii annanni gaaro'i misha	1 eeyya 2 aee.e
		1. eyya(soori annani anani huribati loboka) 0 aeee(sorri anani huribati hofeulasi)	
24 saaxxi xammichchaa, beeballi himoo daraa.....			
903.	Meei korree iituukoo		

	<p>1 matti korree  2 lammi koree  3 sassi koree  4 sorri kore  5 oniti korri hanani</p>	
		<p>1.eyya (lammi kori hanani 24 saxxi woronee  6-8 aganni lammi korri hanani eesami 9-23  sassi korri hanani ihukuyya icco bei  cillichina sorri korri hanani)  0. hanani kuramukissi annani ihulasi</p>
904	<p>Hundomanemmi qodamako issinee  annaniannani cilluwi huribaxxi  bikinaa kanni hanani xamamuki  issinee dabarima bikinaa</p>	<p>1.hunidammi issinemi dabachcha dabatoi  amma  0. Hoffeuu beyonee hanani xamichuwii  matto dabatoi bee amma.</p>