Infant and Young child feeding practice and associated factors among 0-23 months of children in irrigated and non-irrigated area of Dangila district, North West of Ethiopia

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Research Article

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Abstract

Background

Infant and young child feeding practice is a cornerstone of care for child development mentally and growth physically. Failure to proper infant and young child feeding practice is associated with increased risk of childhood morbidity and mortality.

Objective

To assess the prevalence of infant and young child feeding practice among 0-23 months of age children in irrigated and non-irrigated area of Dangila Woreda, North-west Ethiopia, 2021.

Methods

Community based comparative cross-sectional study was conducted from Dec 1, 2020 to Jun 1, 2021 with a total of 823 mothers who have infant and young children 0-23 months of age in 9 selected Keebles were included in the study. Stratified sampling technic was implemented to select irrigated and non-irrigated kebeles and study units. Data was collected by face to face interview method. bivariate and multivariate analysis were used, variables with p<0.05, was taken as statistically significant and independently associated with infant and young child feeding practice. Adjusted odds ratio along with 95% confidence interval was used to assess the strength of the association.

Result

Among 823 households visited, 802 participants gave complete responses with response rate of 97.4%. The overall prevalence infant and young child feeding practice was 62.5%, of these 72.8%(95%CI: 67.5%, 76.1%) from irrigated and 52.2%(95%CI: 47.8%, 57.4%), from non-irrigated area had good practice of IYCF. Moreover, the study identified that ANC (AOR= 2.138, 95% CI: 1.085, 4.210), knowledge (AOR= 2.43, 95% CI: 0.275, 0.612), attitude (AOR= 1.687, 95% CI: 1.129, 2.520), PNC (AOR= 1.606, 95% CI: 1.154, 2.360) and women's decision making (AOR= 1.941, 95% CI: 1.305, 2.888) were significant predictor for IYCF among 0-23 months of age children.

Conclusion

The overall prevalence of infant and young child feeding practice was (62.5%) in the study area and had shown significant variation between irrigated and non-irrigated area. Infant and young child feeding practice is high as compared previous study. Women's decision making, ANC follow up, PNC follow up, attitude and knowledge were identified as the intervention areas.
Introduction

Infant and young child feeding (IYCF) is a set of recommendations to achieve optimal infant and young child feeding practice for 0-23 months of age children (1). The core indicators of IYCF practice includes: early initiation of breastfeeding (EIBF), exclusive breastfeeding (EBF) continued breastfeeding through age of 2 years and timely, adequate and safe complementary feeding (CF) and consumption of iron rich foods (2). Ideally, infants should be breastfed within one hour of birth, exclusively for the first 6 months of life and continue to be breastfed up to 2 years of age and beyond. Starting at 6 months, breastfeeding should be combined with safe, age-appropriate feeding of solid, semi-solid and soft foods (3). Breast milk is an ideal food contains all nutrients and anti-infective factors which prevents from diarrhea and pneumonia (4). Initiating breastfeeding within one hour after birth protects the new born from getting infection and mortality. Breastfeeding supports infant’s immune systems and may protect them later in life from chronic conditions such as obesity and diabetes. In addition, breastfeeding protects mothers against certain types of cancer and other health conditions. Adequate feeding from 6 months onwards can prevent under nutrition and decrease the risk of infectious diseases, such as diarrhea and pneumonia (3, 5). An infant that is not exclusively breastfed could be at a substantially greater risk of death from diarrhea or pneumonia than one who is breast feed (3).

IYCF practice is a cornerstone of care for child development mentally and growth physically, but it is often under estimated. Failure to proper infant and young child feeding practice is associated with increased risks of child health. Such as childhood morbidity, mortality, impaired motor, cognitive and behavioral development, slow physical growth, diminished immunity, reduced learning capacity and under-nutrition (6). Poor nutrition leads to ill-health and ill-health contributes to further deterioration in nutritional status. 50–70% of the burden of diarrheal diseases, measles, malaria and lower respiratory infections was attributable to malnutrition (7, 8).

World Health Organization (WHO) and United Nations international children’s fund (UNICEF), recommendations, infants should be exclusively breastfed for the first six months of life and appropriate complementary feeding after six months. Breastfeeding continues for up to two years of age or beyond (9). Based on this, Ethiopian ministry of health (MOH) established the national nutrition program (NNP II) and the national guideline on adolescent, maternal, infant, and young child nutrition (AMIYCN) to promote optimal feeding practices. The scale-up of community-based nutrition programs and nutrition sensitive activities has been implemented. Like increasing access to potable water and creating expansion of medium and large irrigation schemes, which may help in increasing productivity and diversifying foods produced throughout the year (10–12).

Ethiopia has witnessed encouraging progress in improving IYCF practice over the past decade by developing polices and strategies to support IYCF practice. However, IYCF practice remains so poor. Moreover under-nutrition is one of the main culprits causing high child mortality, accounting half of all childhood deaths in Ethiopia that the country must continue to make significant investments from nutrition again (12).
1.1. Statement of the problem

Globally 10.6 million children under 5 years die every year. Of these mortality malnutrition accounts about 53% of deaths to under-fives children in developing countries (13). Out of world’s under-five children, 162 million stunted (14), 101 million underweight and 52 million were wasted (14). Of the estimated 162 million stunted children, 90 percent are found in Africa and Asia, one of which is Ethiopia. In Sub-Saharan Africa the prevalence of stunting, wasting and underweight were 57.7%, 18% and 28.8% respectively (15). Similarly in Ethiopia, 37%, 7% and 21% of children under-five years were stunted, wasted and underweight respectively; while in Amhara stunting was 46% (4). The magnitude also extends to study area stunting; wasting and underweight were 40.74%, 9.6% and 24.4% respectively (16).

The problem of IYCF practice is vast, it is estimated that 50% and 34.8% of infants are EIBF and EBF for the first 6 months of life respectively. Complementary foods are often introduced too early or too late and are often nutritionally inadequate and unsafe (5, 17, 18). Which is surprise, only 18% of children received a minimum acceptable diet (MAD), 28% received diverse food groups and 55% were feed with minimum meal frequency (MMF) (3). It is well recognized that the size of the problem is high in Africa, 51%, 37-40% and 40%, EBF, MMF and MDD respectively (7, 19, 20). In sub-Saharan less than 35%, 60% and 18% of children 6–23 months of age met the criterion of MDD, MMF and MAD, respectively (21). In Ethiopia also, appropriate infant and young child feeding practice was 32.2% for all indicators and appropriate complementary feeding practice was only 7% (7, 22, 23). According to the 2019, Mini Demographic and Health Survey (EMDHS), in Ethiopia, EIBF and EBF were 73% and 59% respectively. The survey also revealed that, only 7% MAD and 14% MDD are practiced. Contrary to the WHO recommendation to IYCF, 14% of infants 0-5 months consume plain water, 13% consume complementary foods in addition to breast milk. Notably, 6% of infants under age 6 months are not breastfed at all. 9% percent of infants less than 6 months use a bottle with a nipple, a practice that is discouraged because of the risk of exposing the child to illness (24).

WHO and UNICEF have developed the Global Strategy for IYCF practice. It recognizes appropriate infant and child feeding practices to improving nutritional status and decreasing infant mortality in all countries (9). Sustainable developmental goals are launched to combat malnutrition worldwide. Ethiopian Government approved National Nutrition Strategy (NNS) and Health sector transformational plan (HSTP) to reduce the magnitude of malnutrition in Ethiopia, especially amongst children under the age of five. The Ethiopian government also committed to end child under-nutrition by launching ‘Seqota Declaration (6).

Appropriate IYCF feeding has a fundamental importance for human survival, growth, development, health and nutrition to prevent morbidity and mortality significantly from under-five children (5, 25). It also improves nutritional status, which reduces poverty and stimulates economic growth to achieve health, education, employment goals and physical productivity of the labor force (26). While poor IYCF practice is the principal proximate causes of malnutrition during the first two years of life. The cycle of early nutritional deficits are linked to malnourished girl child faces greater odds of giving birth to a
malnourished and low birth weight infant when she grows up (1, 12, 27). Globally, hunger and under nutrition reduce gross domestic product by US$1.4–2.1 trillion a year and losing more than 10% of their lifetime earning potential, thus affecting national productivity (28, 29). The total annual cost of under nutrition in Ethiopia was estimated at Ethiopian Birr (ETB) 55.5 billion, equivalent to 16.5% of Gross Domestic Product (GDP)(30). Eliminating under nutrition in Ethiopia would prevent losses of 8–11% per year from the gross national product(31).

The low prevalence and poor practice of infant and young child feeding practice in most developing countries including Ethiopia are attributed to various socio-demographic, maternal and child health related factors. Such as residence, maternal age, age of the child, maternal occupation, educational status of mother, access to mass media, place of delivery, mode of delivery, knowledge, attitude, HH food security status, women’s decision making and economic status. Those factors are associated with IYCF practice positively or negatively according to studies were identified (7, 22, 23, 32–34).

Different literatures, governmental and non-governmental reports argue that, IYCF practice is not well practiced globally and nationally (9, 35, 36). Even these realities in Ethiopia, there were few studies were conducted to identify the prevalence and associated factors among children less than 2yrs (32, 37, 38). However, most of those studies were conducted in urban area, which is difficult to generalize the findings to rural area and comparative cross-sectional study designs were not implemented. Important variables like house hold food security and attitude were not included. More over the evidence in irrigated and non-irrigated area is scarce or limited. This indicates that, it has a long way to go to fill these gaps. Therefore, the aim of this study is to compare infant and young child feeding practice among 0-23 months of age in irrigated and non-irrigated area.

**Methods**

**Study design and period**

A Community based comparative cross-sectional study was conducted from Dec 1, 2020 to Jun 1, 2021.

**Study area and population**

The study was conducted in Dangila district, which was found in Awi zone located 485 Km from the capital city Addis Ababa and 78 Km from regional city Bahir Dar. In the district there were Amhara and Agew elites with a total projected population of 156169 in the year 2020. It is further divided into 6 sub clusters and 31 kebeles. In Dangila district, there are 1 primary hospital (governmental), 6 Health Centers and 31 health posts. The district childbearing age groups were 34825 of the total female population and under-five age groups were 21145 among these under-two years were 7808(75). Out of 31 kebeles, 10 kebeles were irrigation practiced and 21 kebeles were non-irrigation practiced.

**Source population**

The source populations for the study were all mothers who had infant and young children 0-23 months of age residing in Dangila, Woreda.
Study population

The study populations were all mothers who had infant and young children 0-23 months of age in the selected kebeles.

Study unit

All selected mothers who had infant and young children 0-23 months of age in each selected kebeles.

Inclusion criteria

Mothers who had infant and young children 0-23 months of age in the selected kebeles were included in the study.

Operational definition of terms

Irrigated area: areas where a practice to river diversion, pumping, and small or large dam’s for agricultural cultivation during non-rainfall seasons in addition to rainfall seasons(76).

Non-irrigated area: areas where agricultural cultivation practice is only during rainfall seasons(76).

Appropriate IYCF practice/good: defined as early initiation of breast feeding within1hr after delivery, exclusive breast feeding to infant age less than 6 months, continue breast feeding 1yrs and above, timely introduction of solid, semi-solid and soft foods in 6-8 months of age, minimum dietary diversity, minimum meal frequency, minimum acceptable diet and consumption of Iron rich foods. A practice that was appropriate for a specific age group received a score of 1, and a practice that was inappropriate received a score of 0. If summed score of the indicators is equal to 4 or above ( above mean), it was considered as appropriate(good) IYCFP and if summed score of the indicators is equal to 3 or below ( below mean), it was considered as inappropriate(good) IYCFP (2, 23).

Early initiation of breastfeed: Proportion of children born in the last 23 months who were put to the breast within one hour of birth(77).

Exclusive breastfeeding (EBF): means that an infant receives only breast milk from his or her mother or a wet-nurse, or expressed breast milk, and no other liquids or solids, not even water, with the exception of oral rehydration solution, drops or syrups consisting of vitamins, minerals supplements or medicines(5, 77).

Continued breastfeeding: continue breastfeeding for to 1yrs and above or more along with complementary feeding.

Introduction of complementary feeding: The process of introducing, solid, semi-solid or soft foods along with breast milk 6-8 months, when breast milk is no longer sufficient to meet the nutritional requirements of infants and young children(5).
**Minimum dietary diversity**: Proportion of children 6–23 months of age who receive foods from 4 or more food groups among the 7 food groups (77).

**Minimum meal frequency**: Proportion of breastfed and non-breastfed children 6–23 months of age who receive solid, semi-solid, or soft foods (but also including milk feeds for non-breastfed children. minimum frequency by age defined as: - 2 times for breastfed infants 6-9 months, 3 times for breastfed children 9-24 months and 4 times for non-breastfed children 6-24months. In this study the maximum value 4 was taken to compute meal frequency (77).

**Minimum acceptable diet**: Proportion of children 6–23 months of age who receive a minimum dietary diversity and minimum meal frequency (apart from breast milk) (77).

**Consumption iron rich foods**: Proportion of children 6–23 months of age who receive iron rich foods(77).

**knowledgeable of IYCF**: when the respondents correctly answer above mean of questions about IYCF knowledge(38).

**Less knowledgeable of IYCF**: when the respondents correctly answer below mean of questions about IYCF knowledge(38).

**Positive attitude about IYCF**: when the respondents agree to favorable questions to appropriate IYCF(38).

**Negative attitude about IYCF**: When the respondents disagree and don't know to favorable questions to appropriate IYCF(38).

**Wealth Index**: is a composite measure of the cumulative living standard of a household.

**House hold food security**: A state in which “all people at all times have both physical and economic access to sufficient food to meet their dietary needs for a productive and healthy life”. Measured by asking in the past four week's household food status using yes or no questions. 0 = No (skip to Q—) 1 = Yes (1 = rarely (once or twice in the past four weeks, 2 = Sometimes (three to ten times in the past four weeks, 3 = Often (more than ten times in the past four weeks)

Calculate the household food Insecurity access category for each household. 1 = Food Secure, 2=Mildly Food Insecure Access, 3=Moderately Food Insecure Access, 4=Severely Food Insecure Access(78).

**Women's decision making**: - Participation of women's from HH decision making with their husband. In this study the measurement was by taking three No=0, yes=1 question from DHIS, among these questions the cumulative result=3 women's decision and 1,2= no women's decision making.

**Sample size determination**

Sample size estimation of the study followed two approaches considering the two objectives. For the first objective, sample size was calculated using double population proportion formula by considering the following assumptions: 95% confidence interval, 80% power, and prevalence IYCF practice in irrigated
The two comparison groups population ratio 1:1, prevalence of infant and young child feeding practice \( p_2 = 43.4\% \) was taken from the previous studies done at North Achefer Woreda, Amhara, Ethiopia. For irrigated area the prevalence of infant and young child feeding \( p_1 = 53.4\% \) was taken to detect 10% difference from non-irrigated area. Therefore, \( n_1 = n_2 = 391 \), the group sample was 782 and using the correction formula, So the total sample size was 823 (including the 5% non-response rate).

**Sampling procedure**

Dangila Woreda had a total of 31 kebeles. Stratified random sampling method was implemented to identify irrigated and non-irrigated kebeles. After stratification three kebeles from irrigated and six kebeles from non-irrigated were selected by using simple random sampling technic lottery method. Proportion to size allocation was used to determine the required sample size from each selected Kebeles. The sample was taken by using systematic simple random sampling technique from the list of infant and young children registration at health post. Finally select the study participants until that a total of 823 mothers who had infant and young children 0-23 months of age fulfill.

**Instrument and Data collection procedure**

Questioner was prepared after reviewing different literature developed for similar purposes by different authors. The questioner was developed in English then translated in to local language (Amharic) and finally retranslated back to English to check its consistency. The questionnaire was containing socio-demographic and economic, house hold food security, Knowledge and attitude related factors and maternal, child health service related factors and women's decision making.

Data was collected by using face-to-face interview method. The data collection was conducted in a private and calm environment to ensure confidentiality. The data collectors were four diploma nurses and the supervisor was one health officer. A total of 30 days was taken for data collection period from Dec 8, 2020 to Jun 8, 2021.

**Data Quality Assurance**

Quality of data was assured by using properly designed questionnaire adapted from previous literatures, EDHS and different guidelines. The other data quality assurance method also by gave training for both data collectors and supervisor on the purpose of the study, data collection technique and the proper filling of questioner by the principal investigator for two days. Data quality was controlled through conducting pretest; pretest was conducted on 5% of the samples in adjacent kebeles from chara to check the quality of the questionnaire and the instrument prior to the actual data collection with similar socio-demographic characteristics. Every day after data collection, questionnaires was reviewed by principal investigator for ensuring completeness of questions. Incomplete questionnaires were discarded from the analysis. The principal investigator and the supervisor were closely monitor the data collection process. In addition to the above, data was rechecked during data entry into the computer software before analysis, to prevent missing of important data.
Data processing, analysis and presentation

The completeness of the questioner also checked before data entry and the data was coded entered and stored in to the computer using Epi-info data version 7, then exported to SPSS statistical software version 23. Data was cleaned and analyzed by SPSS software. Descriptive analysis was used to describe the percentage and number of distribution of the respondents by socio demographic characteristics and other relevant variables in the study. In order to investigate the association of independent variables with dependent variables bivariate logistic regression analysis was performed on the independent variables and their proportion and crude odds ratio will be computed against the outcome variable to identify the factors that will be associated with the dependent variables. Those variables that showed an association with the outcome variables at the bivariate analysis with p-value < 0.25 was entered in to the final logistic regression to control for potential confounders. Hosmer-lemeshow goodness of-fit was used to test for the model fitness. Adjusted odds ratio (AOR) along with 95% confidence interval was estimated to assess the strength of the association and P value less than 0.05 was taken as significant.

Ethical consideration

Letter of ethical approval was obtained from the Institutional Review Board (IRB) of Bahirdar University, College of Medicine and Health Sciences. Furthermore, before the data collection, formal permission letter was obtained from Dangila administrative council and health office. Before data collection all participants were asked to give a verbal informed consent. Before starting the interview, the data collector was explaining the purpose of the study for all the participants with confirming confidentiality of their information that it was never be used for purposes other than scientific research. Participation in the study was voluntary based and autonomy of participant was respected. Participants were informed that participation was voluntary and if they felt discomfort during the interview they could stopped at any time.

Result

Socio-demographic characteristics

Among 823 households visited, 802 respondents with a response rate 97.8% in irrigated and 96.11% in non-irrigated area gave complete responses. Of those study participants 276(68%) and 263(66.4%) had 6-23months of age children in irrigated and in non-irrigated Area respectively. The mean(±SD) age of children were 10.61(±6.1) months and the mean age of mothers were 30.3 (±6.2) years. Regarding to mother’s educational status, 213(52.5%) and 182(46%) of mothers in irrigated and non-irrigated area had no formal education respectively. Almost all the participants of this study 395(98%) in irrigated and 391(98.74%) in non-irrigated area were orthodox Christian followers. The Wealth index status of households 209(51.48%) and 134(33.8%) had higher asset of household economy among irrigated and non-irrigated Area respectively (Table 2).
Table 2
Socio-economic and demographic characteristics of the respondents from irrigated and non-irrigated Area of Dangila Woreda, north-west Ethiopia, 2021 (n=802)

| Characteristics          | Kebele category code |               |               |               | P-value |
|--------------------------|----------------------|---------------|---------------|---------------|---------|
|                         | Irrigated (n=406)    | Non-irrigated (n=396) | Totally (n=802) |               |         |
|                         | Frequency | %   | Frequency | %   | Frequency | %   |         |
| Response rate            | 406       | 98.7 | 396      | 96.11 | 802      | 97.4 |         |
| Age of mother            |           |      |          |      |          |      |         |
| <=25yrs                  | 114       | 28.1 | 101      | 25.5  | 215      | 26.8 | 0.592   |
| 25-34 yrs.               | 104       | 25.6 | 98       | 24.7  | 202      | 25.2 |         |
| 35 and above             | 188       | 46.31| 192      | 48.48 | 385      | 48   |         |
| Age of child             |           |      |          |      |          |      |         |
| 0-6months                | 130       | 32   | 133      | 33.6  | 263      | 32.8 | 0.637   |
| 6-23 months              | 276       | 68   | 263      | 66.4  | 539      | 67.2 |         |
| Sex of child             |           |      |          |      |          |      |         |
| Male                     | 225       | 55.4 | 185      | 46.7  | 410      | 51.1 | 0.014   |
| Female                   | 181       | 44.6 | 211      | 52.28 | 392      | 48.9 |         |
| Education of mother      |           |      |          |      |          |      |         |
| No formal education      | 213       | 52.46| 182      | 46    | 395      | 49.3 | 0.191   |
| Primary and above        | 193       | 47.54| 214      | 54    | 407      | 50.7 |         |
| Occupation of mother     |           |      |          |      |          |      |         |
| House wife               | 311       | 76.6 | 313      | 79    | 624      | 77.8 | 0.199   |
| Merchant                 | 16        | 4.2  | 10       | 2.53  | 26       | 3.2  |         |
| Farmer                   | 43        | 10.6 | 50       | 12.26 | 93       | 11.6 |         |
| Other                    | 36        | 8.6  | 23       | 5.8   | 59       | 7.4  |         |
| Religion                 |           |      |          |      |          |      |         |
| Orthodox                 | 395       | 97.3 | 391      | 98.74 | 786      | 98   | 0.306   |
| Muslim                   | 8         | 2    | 3        | 0.7   | 11       | 1.4  |         |
| Other                    | 3         | 0.7  | 2        | 0.5   | 5        | 0.6  |         |
| Characteristics                  | Kebele category code | Totally | P-value |
|---------------------------------|----------------------|---------|---------|
|                                 | Irrigated Area(n=406)|         |         |
|                                 | Non-irrigated Area(n=396) |         |         |
| Educational status of husband   |                      |         |         |
| No formal education             | 162                  | 39.9    | 128     | 32.3  | 290 | 38.8 | 0.177 |
|                                 | 39.9                 |         | 32.3    | 290   | 38.8 |       |       |
|                                 | 128                  | 32.3    | 290     | 38.8  |       |       |       |
| Primary and above               | 215                  | 53      | 242     | 61.1  | 457 | 61.2 |       |
|                                 | 53                   |         | 61.1    | 457   | 61.2 |       |       |
|                                 | 242                  | 61.1    | 457     | 61.2  |       |       |       |
| Occupation of husband           |                      |         |         |       |     |     |       |
| Farmer                          | 304                  | 74.9    | 306     | 77.27 | 610 | 86.6 | 0.268 |
|                                 | 74.9                 |         | 77.27   | 610   | 86.6 |       |       |
|                                 | 306                  | 77.27   | 610     | 86.6  |       |       |       |
| Merchant                        | 36                   | 8.8     | 30      | 7.57  | 66  | 9.4  |       |
|                                 | 8.8                  |         | 7.57    | 66    | 9.4 |       |       |
|                                 | 30                   | 7.57    | 66      | 9.4   |       |       |       |
| Other                           | 18                   | 4.43    | 10      | 2.52  | 28  | 4    |       |
|                                 | 4.43                 |         | 2.52    | 28    | 4   |       |       |
|                                 | 10                   | 2.52    | 28      | 4     |       |       |       |
| Total family size               |                      |         |         |       |     |     |       |
| 1-4                             | 290                  | 71.4    | 269     | 67.9  | 559 | 69.7 | 0.158 |
|                                 | 71.4                 |         | 67.9    | 559   | 69.7 |       |       |
|                                 | 269                  | 67.9    | 559     | 69.7  |       |       |       |
| >4                              | 116                  | 28.57   | 127     | 32    | 243 | 30.3 |       |
|                                 | 28.57                |         | 32      | 243   | 30.3 |       |       |
|                                 | 127                  | 32      | 243     | 30.3  |       |       |       |
| Wealth index                    |                      |         |         |       |     |     |       |
| Poor                            | 82                   | 20.17   | 125     | 31.6  | 207 | 25.8 | 0.0002|
|                                 | 20.17                |         | 31.6    | 207   | 25.8 |       |       |
|                                 | 125                  | 31.6    | 207     | 25.8  |       |       |       |
| Medium                          | 115                  | 28.33   | 137     | 34.6  | 252 | 31.4 |       |
|                                 | 28.33                |         | 34.6    | 252   | 31.4 |       |       |
|                                 | 137                  | 34.6    | 252     | 31.4  |       |       |       |
| Higher/rich                     | 209                  | 51.48   | 134     | 33.8  | 343 | 42.8 |       |
|                                 | 51.48                |         | 33.8    | 343   | 42.8 |       |       |
|                                 | 134                  | 33.8    | 343     | 42.8  |       |       |       |

**Prevalence of infant and young child feeding**

In this study 802 participants respond on the issue of infant young child feeding practice(IYFS). Three hundred five 75% and two hundred seventy 68.2% of mothers were early initiation of breast feeding within 1hr after delivery in the irrigated and the non-irrigated area respectively. Almost all 95.6% and 93.4% were continued breast feeding until 1yrs and above in irrigated and non-irrigated area respectively. Among breast feed mothers 259(63.8%) in irrigated and 229(57.8%) in non-irrigated were exclusively breast feed for the first six months. From the participants 234(54.7%) in irrigated and 181(40.3%) in non-irrigated area were introduce complementary feeding timely. The minimum dietary diversity was 161(58.3%) in irrigated and 68(25.9%) in non-irrigated area respectively. Minimum meal frequency was 201(72.8%)in irrigated and 68(25.9%) in non-irrigated area respectively. Among breast feed mothers were 259(63.8%) in irrigated and 229(57.8%) in non-irrigated were exclusively breast feed for the first six months. From the participants 234(54.7%) in irrigated and 181(40.3%) in non-irrigated area were introduce complementary feeding timely. The minimum dietary diversity was 161(58.3%) in irrigated and 68(25.9%) in non-irrigated area respectively. Minimum meal frequency was 201(72.8%)in irrigated and 68(25.9%) in non-irrigated area respectively. Among breast feed mothers were 259(63.8%) in irrigated and 229(57.8%) in non-irrigated were exclusively breast feed for the first six months. From the participants 234(54.7%) in irrigated and 181(40.3%) in non-irrigated area were introduce complementary feeding timely. The minimum dietary diversity was 161(58.3%) in irrigated and 68(25.9%) in non-irrigated area respectively. Minimum meal frequency was 201(72.8%)in irrigated and 68(25.9%) in non-irrigated area respectively. Among breast feed mothers were 259(63.8%) in irrigated and 229(57.8%) in non-irrigated were exclusively breast feed for the first six months. From the participants 234(54.7%) in irrigated and 181(40.3%) in non-irrigated area were introduce complementary feeding timely. The minimum dietary diversity was 161(58.3%) in irrigated and 68(25.9%) in non-irrigated area respectively. Minimum meal frequency was 201(72.8%)in irrigated and 63(24%) in non-irrigated area.

the overall IYCF practice score was 293(72.2%) in irrigated and 208(52.8%) in non-irrigated area had good practice of IYCF (Table 3).
Table 3  
-Prevalence of infant and young child feeding of the respondents from irrigated and non-irrigated Area of Dangila district, north-west Ethiopia, 2021 (n=802)

| Characteristics                          | Kebele category code | Irrigated Area (n=406) | Non-irrigated (n=396) | Totally | P-value |
|------------------------------------------|----------------------|------------------------|-----------------------|---------|---------|
|                                          |                      | Frequency              | %                     | Frequency| %       |        |
| Initiation of BF within 1hr after delivery|                      |                        |                       |         |         |
| No                                       | 101                  | 126                    | 126                   | 227     | 28.3    | 0.029  |
| Yes                                      | 305                  | 270                    | 270                   | 575     | 71.7    |         |
| Exclusive breast feeding                 |                      |                        |                       |         |         |
| No                                       | 147                  | 167                    | 167                   | 314     | 39.2    | 0.084  |
| Yes                                      | 259                  | 229                    | 229                   | 488     | 60.8    |         |
| Continued breast feeding to 1yrs         |                      |                        |                       |         |         |
| No                                       | 18                   | 26                     | 26                    | 44      | 5.5     | 0.185  |
| Yes                                      | 388                  | 370                    | 370                   | 758     | 94.5    |         |
| Introduction of CF (n >=6-23months=276)  |                      |                        |                       |         |         |
| No                                       | 125                  | 157                    | 157                   | 282     | 52.3    | 0.001  |
| Yes                                      | 151                  | 106                    | 106                   | 257     | 47.7    |         |
| Minimum dietary diversity (n >=6-23mont=276) |                |                        |                       |         |         |
| No                                       | 115                  | 195                    | 195                   | 310     | 57.5    | 0.0000 |
| Yes                                      | 161                  | 68                     | 68                    | 229     | 42.5    |         |
| Minimum meal frequency (n >=6-23month=276) |                |                        |                       |         |         |
| No                                       | 75                   | 147                    | 147                   | 222     | 41.2    | 0.000  |
| Yes                                      | 201                  | 116                    | 116                   | 317     | 57.8    |         |
| Minimum acceptable diet (n >=6-23month=276) |                |                        |                       |         |         |
| No                                       | 152                  | 200                    | 200                   | 352     | 67.3    | 0.0006 |
| Yes                                      | 124                  | 63                     | 63                    | 187     | 34.7    |         |
| Consumption of iron rich foods (n >=6-23month=276) |        |                        |                       |         |         |
| No                                       |                      |                        |                       |         |         |
| Yes                                      |                      |                        |                       |         |         |
| Characteristics                        | Kebele category code |                  |  |
|---------------------------------------|----------------------|-----------------|---|
|                                       | Irrigated Area (n=406) | Non-irrigated Area (n=396) | Totally | P-value |
| No                                    | 73                   | 26.4            | 130 | 49.4     | 203 | 37.7 | 0.0001 |
| Yes                                   | 203                  | 73.6            | 133 | 50.5     | 336 | 62.3 |
| Over all IYCF practice                |                      |                  |  |
| Poor                                  | 113                  | 27.8            | 188 | 47.5     | 301 | 37.5 |
| Good                                  | 293                  | 72.2            | 208 | 52.5     | 501 | 62.5 |

**Maternal and child health service utilization**

Out of 802 study participants 385(94.8%) and 370(93.4%) in irrigated and non-irrigated area had ANC follow up. Among these only 107(27.8%) in irrigated and 73(19.7%) in non-irrigated area had four and above ANC follow up and 329(85%) in irrigated and 312(84.3%) in non-irrigated area were counseled about IYCF practice during ANC follow up. Almost all 388(95.6%) in irrigated and 366(92.4%) in non-irrigated area were attending institutional delivery. Majority of the participants 276(68%) in irrigated and 198(50%) in non-irrigated area had PNC follow up respectively (Table 4).

Table 4:- Maternal and child health service related factors of the respondents from irrigated and non-irrigated Area of Dangila district, north-west Ethiopia, 2021 (n=802)
| Characteristics                          | Kebele category code |                |                |                |                |                |
|------------------------------------------|----------------------|----------------|----------------|----------------|----------------|----------------|
|                                          | Irrigated Area (n=406) | Non-irrigated Area (n=396) |                |                |                |                |
|                                          | Frequency     | %       | Frequency     | %       | Frequency     | %       |                |                |
| History of ANC attendance                | No           | 21      | 5.2          | 26      | 6.6          | 47      | 5.9          | 0.008          |
|                                          | Yes          | 385     | 94.8         | 370     | 93.4         | 755     | 94.1         |                |
| Time of first ANC starting (n=385)       | 1-4 months of pregnancy | 208      | 54          | 158     | 42.7         | 361     | 47          | 0.002          |
|                                          | 5 and above months | 177      | 46          | 212     | 57.3         | 394     | 52.2         |                |
| Number of ANC Follow up (n=385)          | Once         | 44      | 11.4         | 55      | 14.9         | 99      | 13.1         | 0.0001         |
|                                          | Two times    | 108     | 28.1         | 144     | 38.9         | 252     | 33.4         |                |
|                                          | Three times  | 126     | 32.7         | 98      | 26.5         | 224     | 29.7         |                |
|                                          | Four and above | 107     | 27.8         | 73      | 19.7         | 180     | 23          |                |
| IYCF counseling ANC follow up (n=385)    | No           | 56      | 14.5         | 58      | 15.7         | 114     | 15          | 0.165          |
|                                          | Yes          | 329     | 85.5         | 312     | 84.3         | 641     | 85          |                |
| Place of birth                           | Health facility | 388     | 95.6        | 366     | 92.4        | 756     | 94.4        | 0.006          |
|                                          | Home         | 18      | 4.4          | 30      | 7.6          | 48      | 5.6          |                |
| Birth attendant                          | Health professional | 388     | 95.6        | 366     | 92.4        | 756     | 94.4        | 0.111          |
|                                          | TBA          | 18      | 4.4          | 30      | 7.6          | 48      | 5.6          |                |
| PNC follow up                            | No           | 130     | 32          | 190     | 47.8        | 320     | 39.9        | 0.0004         |
|                                          | Yes          | 276     | 68          | 206     | 52          | 474     | 59.1        |                |
| IYCF counseling during PNC               | No           | 79      | 19.5         | 116     | 29.3        | 195     | 24.3        | 0.543          |
|                                          | Yes          | 286     | 80.5         | 273     | 70.7        | 559     | 75.7        |                |
| Characteristics         | Kebele category code | Totally | P-value |
|-------------------------|----------------------|---------|---------|
|                         | Irrigated Area(n=406) | Non-irrigated Area(n=396) |         |
| Yes                     | 327                  | 80.5    | 280     | 70.7    | 607     | 75.7    |
| Multiple delivery       |                      |         |         |         |
| No                      | 359                  | 88.4    | 356     | 89.9    | 715     | 89.2    | 0.351   |
| Yes                     | 47                   | 11.6    | 40      | 10.1    | 87      | 10.8    |
| Birth order             |                      |         |         |         |
| First                   | 56                   | 14      | 36      | 9       | 88      | 11.6    | 0.275   |
| Second and above        | 349                  | 86      | 360     | 91      | 714     | 88.4    |
| Birth space             |                      |         |         |         |
| 2yrs and above          | 294                  | 72.4    | 282     | 71.2    | 576     | 71.8    | 0.080   |
| Less than two yrs.      | 112                  | 27.6    | 114     | 28.8    | 226     | 28.2    |

**Knowledge, attitude, household food security status and women’s decision making**

From a total of 802 study participants 261(64.3%) in irrigated and 200(50.5%) in non-irrigated area were knowledgeable based on knowledge score criteria responding above mean to knowledge assessment questions. Among 802 study participants 246(60.6%) in irrigated and 183(46.2%) in non-irrigated area had positive attitude toward infant and young child feeding practice. Out of the participants 9(2.2%) in irrigated and 27(6.8%) in non-irrigated area had house hold food insecurity. Only 28.3% in irrigated and 20.2% in non-irrigated area had women’s decision power (Table 5).
Table 5
knowledge, attitude, household food security status and women’s decision making of the respondents from irrigated and non-irrigated Area of Dangila district, north-west Ethiopia, 2021 (n=802)

| Characteristics | Kebele category code | Totally | P-Value |
|----------------|----------------------|---------|---------|
|                | Irrigated Area(n=406) | Non-irrigated Area(n=396) |         |
|                | Frequency % | Frequency % | Frequency % |         |
| Knowledge of respondents | | | | 0.000316 |
| Less knowledgeable | 145 35.7 | 196 49.5 | 341 42.5 |
| knowledgeable | 261 64.3 | 200 50.5 | 461 57.7 |
| Attitude of respondents | | | | 0.00001 |
| Negative attitude | 160 39.4 | 213 53.8 | 373 46.5 |
| Positive attitude | 246 60.6 | 183 46.2 | 429 53.5 |
| HH food security status | | | | 0.003 |
| Food insecure | 9 2.2 | 27 6.8 | 36 4.5 |
| Food secure | 397 97.8 | 369 93.2 | 766 95.5 |
| Women’s decision making | | | | 0.007 |
| No | 291 71.7 | 316 79.8 | 607 75.7 |
| Yes | 115 28.3 | 80 20.2 | 195 24.3 |

Factors associated with IYCF practice in irrigated and non-irrigated area

During the bi-variate logistic regression analysis; women’s decision making, ANC follow up, place of birth, birth attendant, PNC follow up, total family size, multiple delivery, attitude of mother, IYCF counseling, knowledge of respondent, HH food security status, educational status of respondent and wealth index were candidate (p<0.25) for multivariable analysis among 0-23months of children.

Whereas, the multivariate logistic regression analysis revealed that women’s decision making, ANC follow up, place of birth, PNC follow up, multiple delivery, attitude and knowledge of mothers were significantly associated to IYCF practice. Mothers who had ANC follow up had two times more likely IYCF practicing than mothers who hadn't ANC follow up (AOR= 2.138, 95% CI: 1.085, 4.210). Mothers who were knowledgeable had 2.43 times more likely practicing IYCF than mothers who had less knowledgeable
Mothers who had positive attitude had 1.687 times IYCF practicing than mothers who had negative attitude (AOR= 1.687, 95% CI: 1.129, 2.520). Mothers who had PNC follow up has 1.606 times more likely practicing IYCF than mothers who had not PNC follow up (AOR= 1.606, 95% CI: 1.154, 2.360). Mothers who had participate at household decision making has 1.941 times more likely to practice infant and IYCF than mothers who had not participating at household decision making (AOR= 1.941, 95% CI: 1.305, 2.888) (Table 6).
### Table 6
Factors associated with IYCF practice of the respondents from irrigated and non-irrigated Area of Dangila district, north-west Ethiopia, 2021 (n=802)

| Characteristics            | IYCF practice (n=802) | P-value |
|----------------------------|-----------------------|---------|
|                            | Good (n=802) | Poor (n=802) | COR(95%CI) | AOR(95%CI) |
| Women's decision making    |                        |         |
| Yes                        | 143(17.5%) | 52(6.5%) | 1.913(1.340, 2.731) | 1.941(1.305, 2.888) | 0.001** |
| No                         | 358(44.6%) | 249(31%) | 1         | 1         |        |
| ANC                        |                        |         |
| Yes                        | 485(60.5%) | 270(33.2%) | 3.480(1.870, 6.479) | 2.138(1.085, 4.210) | 0.0028* |
| No                         | 16(2%) | 31(3.9%) | 1         | 1         |        |
| Place of birth             |                        |         |
| At home                    | 18(2.2%) | 27(3.4%) | 1         | 1         |        |
| At health facility         | 483(60.2%) | 274(37.5%) | 0.378(1.430, 4.889) | 0.495(1.006, 4.008) | 0.48 |
| Multiple delivery          |                        |         |
| Yes                        | 35(4.4%) | 52(6.5%) | 0.360(0.228, 0.567) | 0.352(0.215, 0.577) | 0.34 |
| No                         | 466(58.1%) | 249(31%) | 1         | 1         |        |
| PNC                        |                        |         |
| Yes                        | 334(41.8%) | 140(17.8%) | 2.30(1.716, 3.083) | 1.606(1.154, 2.236) | 0.005* |
| No                         | 167(20.8%) | 161(20.1%) | 1         | 1         |        |
| Attitude                   |                        |         |
| Positive                   | 325(40.5%) | 104(13%) | 3.498(2.591, 4.721) | 1.687(1.129, 2.520) | 0.011* |
| Negative                   | 176(21.4%) | 197(24.6%) | 1         | 1         |        |
| Knowledge                  |                        |         |
| knowledgeable             | 350(43.6%) | 111(13.8%) | 3.968(0.186, 0.341) | 2.430(0.275, 0.612) | 0.000012** |

*P value <0.05 **P value<=0.001
| Characteristics     | IYCF practice (n=802) | P-value |
|--------------------|-----------------------|---------|
|                    | Good | Poor | COR(95%CI) | AOR(95%CI) |         |
| Less knowledgeable | 151(18.8%) | 190(23.7%) | 1 | 1 |         |

*P value <0.05  **P value<=0.001

Factors associated with IYCF practice in irrigated area

During the bi-variate logistic regression analysis; women's decision making, ANC follow up, place of birth, birth attendant, PNC follow up, total family size, multiple delivery, attitude of mother, IYCF counseling, knowledge of respondent, HH food security status and wealth index were candidate (p<0.25) for multivariable analysis among 0-23months of children.

Whereas, the multivariable analysis revealed that women's decision making, birth attendant, attitude of mother, knowledge of mothers and wealth index were significantly associated to infant and young child feeding practice. Mothers who had participating at household decision making has 1.844 times more likely (AOR= 1.844, 95% CI: 0.945, 3.597) practicing IYCF than mothers who had no participating at household decision making. Mothers who had health professional birth attendant has 3.989 times more likely (AOR= 3.989, 95% CI: 1.074, 14.818) practicing IYCF than mothers who had traditional birth attendant. Mothers who had positive attitude are 0.549 times more likely (AOR= 0.549, 95% CI: 0.271, 1.111) practicing IYCF than mothers who had negative attitude. Mothers who were knowledgeable has 5.061 times more likely (AOR= 5.061, 95% CI: 2.465, 10.389) practicing IYCF than mothers who were less knowledgeable. Mothers who were rich has 0.219 times more likely (AOR= 0.219, 95% CI: 0,090, 0.534) practicing infant and young child practice than mothers who were poor.
Factors associated with IYCF practice in non-irrigated area

During the bivariate logistic regression analysis; women's decision making, ANC follow up, place of birth, birth attendant, PNC follow up, total family size, multiple delivery, attitude of mother, IYCF counseling,
knowledge of respondent, were candidate (p<0.25) for multivariable logistic regression analysis among 0-23 months of children.

Whereas, the multivariable logistic regression analysis revealed that women’s decision making, ANC follow up, multiple delivery and knowledge of mothers were significantly associated to infant and young child feeding practice. Mothers who had participating at household decision making has 1.772 times more likely (AOR= 1.772, 95% CI: 0.898, 3.261) practicing IYCF than mothers who had no participating at household decision making. Mothers who had no multiple delivery has 0.261 times more likely (AOR= 0.261, 95% CI: 0.115, 0.96) practicing IYCF than mothers who had multiple delivery. Mothers who had ANC follow up has 2.535 times more likely (AOR= 2.535, 95% CI: 1.013, 6.342) practicing IYCF than mothers who had no ANC follow up. Mothers who were knowledgeable has 0.4 times more likely (AOR= 0.400, 95% CI: 0.263, 0.608) practicing IYCF than mothers who were less knowledgeable.

Table 8
Factors associated with IYCF practice of the respondents from in non-irrigated Area of Dangila district, north-west Ethiopia, 2021 (n=396)

| Characteristics          | IYCF practice (n=396) | P-value |
|--------------------------|-----------------------|---------|
|                          | Good     | Poor    | COR(95%CI) | AOR(95%CI) |         |
| Women’s decision making  |          |         |           |           |         |
| Yes                      | 52(13.1%) | 28(7.1%) | 1.904(1.444, 3.171) | 1.772(0.898, 3.261) | 0.02*   |
| No                       | 156(39.4%) | 160(40.4%) | 1 | 1 |         |
| ANC                      |          |         |           |           |         |
| Yes                      | 201(50.8%) | 169(42.7%) | 3.228(1.325, 7.864) | 2.535(1.013, 6.342) | 0.047* |
| No                       | 7(1.8%)   | 19(4.8%)  | 1 | 1 |         |
| Multiple delivery        |          |         |           |           |         |
| No                       | 176(44.4%) | 180(45.5%) | 0.244(0.110, 0.545) | 0.261(0.115, 0.96) | 0.001* |
| Yes                      | 32(8.1%)  | 8(2)     | 1 | 1 |         |
| Knowledge                |          |         |           |           |         |
| Less knowledgeable       | 80(20.2%) | 116(29.3%) | 1 | 1 |         |
| Knowledgeable            | 128(32.3%) | 72(18.2%) | 0.3879(0.259, 0.582) | 0.400(0.263, 0.608) | 0.0002* |

*P value <0.05 **P value<=0.001
Discussion

The finding of this study revealed that two-third 75% in irrigated and 68.2% in non-irrigated area of respondent's had early initiation of breast feeding within one hr. after delivery, which was higher than studies conducted in Kingdom of Saudi Arabia (43%)(44) and Nigeria 34.7%(47). The deference might be health facility delivery and skill birth attendant leads to the opportunity of early initiation of breast feeding by health professionals. It might be also health service performance and socio-cultural barriers and the knowledge of the mother when to start breast feeding after delivery. On the other hand, the finding of this study was consistent with EDHS survey analysis in Ethiopia (74.3%)(51) and study conducted in Assella town 70%(56). It could be the focus and commitment of the government for child health and nutrition throughout the country is similar and dramatically increment of skill delivery. This might have the opportunity of initiating breast feeding within 1hr after delivery. More than half of the respondents (63.8%) in irrigated and 57.8% in non-irrigated area were exclusively breast feed for the first six months even without water. It was greater than studies conducted in Somaliland (20.47%)(49), Bishoftu (34.1%) (55) and East Gojam at Motta (50.1%)(57). The discrepancy for this result might be due to socio-economic difference and cultural practice between study subjects in different part of Ethiopia. But lower than studies conducted in Assella town (86.3%)(56). It might be residence, living in urban has an access to health service and media exposure to have information about breast feeding than those living in rural. continued breast feeding to 1yrs and above were (95.6%) in irrigated and 93.4% in non-irrigated area, which is higher than study conducted in Jima (75.6%)(54). The probability of the difference might be, the majority of the participants in this study were housewives which could increase the likelihood of breastfeeding to their child, as it cost less when they have a poor economic status and they spend much of their time at home which increases the likelihood of continuing to breastfeed. Beyond this mothers in urban area might have workload, to turn their works mothers stop breast feeding early and use formula milk instead of breast milk. Urban mothers have better economical assets than those living in rural, based on this fact mothers in urban setting use breast milk substitution by commercially produced formula milk, cow milk and other commercially available foods due to its easily accessible and ability of purchasing.

In this study timely introduction of complementary feeding at 6 months and above was found to be (54.7%) in irrigated and 40.3% in non-irrigated area, which was close to the study conducted in two Agro-ecological zone of Ethiopia (50.5%)(52). On the contrary it was lower than studies conducted in India (72.7%)(42), Addis Ababa (81.1%)(53) and Jima (82.9%)(54). This might be the difference between Indian and Ethiopian socio-economic level, cultural practice, accessibility of child foods items and nutrition action intervention from ministry of health to health professionals, like health extension program implementation in Ethiopia. Another reason might be in deferent part of Ethiopia awareness level, economical status, health service accessibility and performance have its own influence on IYCF practice. Like ways minimum dietary diversity was (58.3%) in irrigated and 25.9% in non-irrigated area, it was greater than studies done at Northern India (29.6%)(43) and in Kenya (32-40%)(48), in Shashemene16.1% (23), in two Agro-ecological zone of Ethiopia (22.2%) (53), EDHS 2016 survey analysis (14.9%) (52) and Assella town (26.6%)(56). This fact might be the study including irrigated area, enabling variety of food groups to be easily accessible and improve or growth of household economic status to feed diversified
foods. Another reason might be, optimization of health extension program and community based neonatal care implementation was supported by Path finder from study area. Due to these facts the minimum dietary diversity becomes increased. Minimum meal frequency were (72.8%) in irrigated and 44.1% in non-irrigated area. Minimum acceptable diet was (44.9%) in irrigated and 24% in non-irrigated, which was lower than as compared to studies conducted in India (45.8) (42) and Addis Ababa (65.1%) (53). The minimum acceptable diet was greater than in India (19.5%) (42) and two Agro-ecological Zone of Ethiopia (12%) (52). This discrepancy might be due irrigation scheme, socio-economic and cultural practice between country and study setting.

The overall prevalence of infant and young child feeding practice in this study was 72.2% (95%CI: 67.5%, 76.1%) in irrigated and 52.5% (95%CI: 47.8%, 57.4%) in non-irrigated area and out of the total was 62.5%, (95%CI: 59.1, 65.8%). The finding of this study is greater than the studies conducted Shashemene (32%) (23), North Achefer 43.4% (38) and South Wollo Zone (45.5%) (58). The deference might be due to the study setting including irrigated area, which enhances diversified foods and economical assets of the household. In addition to this it might be the level of health service and, time gap between study period and socio-economic and the support of non-governmental organizations makes the difference between study area.

In this study the prevalence of IYCF practice had statistically significant variation among 0-23 months of age children. The possible explanation for this significance variation might be due difference of household wealth index status in irrigated and non-irrigated area. It may be happening due to irrigation scheme, since irrigation increases productivity in addition to non-rainfall season. Beside to this economically improved community has increased health seeking behavior and uptake of health services, so mother's in irrigated area had most likely child health service than mothers' in non-irrigated area to enhances IYCF practice. The other reason for the difference might be mothers in irrigated area can easily accesses variety of food items due to opportunity of production by irrigation or purchasing than non-irrigated area. This an advantage to enhances timely introduction of complementary feeding, increases minimum dietary diversity, minimum meal frequency and minimum acceptable diet results to improving IYCF practice in irrigated area than in non-irrigated area. Another issue for the difference might be mothers in irrigated may have frequent health facility visit, which enables to gaining IYCF related information's at health facility and better media accesses. This may intern increases mother's knowledge and attitude towards IYCF practice, which has better infant and young child feeding practice again (6).

A significant association was observed between mothers’ participation on household decision making and good IYCF practice in both irrigated and non-irrigated area. The prevalence of IYCF practice was significantly higher among those who had women’s decision making as compared to those who do not women’s decision making. The possible explanation might be mothers who have participating on household decision making can get free time to feed their child and can purchase easily foods which is not available in the household. In addition to this, mothers who had participation on household decision making has freedom to visit health facilities for child health service with IYCF education. These
opportunities are used as input to achieve or to have good IYCF practice. This finding was supported with the previous studies conducted in south Ethiopia(71).

ANC follow up has significantly associated with infant and young child feeding practice. It could be due to, mothers who had ANC follow up has a chance to gain health worker counselling and education about IYCF practice and participating cooking demonstration during ANC follow up. Pregnant and lactating mothers conference has key messages about IYCF practice during their ANC follow up. The same result was observed from the previous study conducted in Assella(56),and Gondar town(64).

In this study PNC follow up was associated with infant and young child feeding practice among 0-23months of age children. Mothers who had PNC follow up are receiving information to breast feeding, complementary feeding and diversified foods within cooking demonstration. Beside to this, health professionals may show practical demonstrations and role models for breast feeding and complementary feeding. Furthermore, it might be the strength of health extension worker implementation to maternal health service packages including postnatal service. This finding is supported by previous studies conducted in Assella(56), Shashemene(23).

knowledge and attitude were significantly associated to infant and young child feeding practice. Mothers who were knowledgeable and mothers who had positive attitude were more likely practice infant and young child feeding practice. This might be those mothers having information and understanding about the issue of IYCF components can have a better chance of good IYCF practice. The same is true mothers who has positive inclination toward IYCF have a chance to increase IYCF practice. This result is supported by the previous studies conducted in Saudi Arabia(44), Uganda(45), in North west Ethiopia(71) and in Kenya(48). (71).

An association was observed between wealth index and good infant and young child feeding practice among 0-23months of age children in irrigated area. Mothers who are rich has good infant and young child feeding practice than mothers who were poor. This finding is true, because irrigation by itself has an advantage for economic growth, this reality makes to have better nutrition. This result is evidenced by the previous study conducted in Wollo Zone, EDHS, 2016 analysis, Gondar town north Achefer district (38, 58, 64, 66).

In irrigated area skill birth attendant has a significant association to good infant and young child feeding practice. Mothers who hand skilled birth attendance has good IYCF practice than those who had traditional birth attendant. This fact might be in irrigated area four and above ANC follow up were higher than in non-irrigated area. This frequent health facility visits enables adherence with maternal health services and health professionals leading to enhance skill delivery. During skill birth attendance facilitating early initiation of breast feeding, counseling about IYCF practice, informing the bad effects of pre-lacteal feeding and all child health services by skill birth attendant. The above justification is coincide with the previous study conducted in Shashemenie, Assela Town, Hawassa (23, 56, 64–66).
Between multiple delivery and infant and young child feeding has significant association in non-irrigated area. Mothers who had single delivery has better infant and young child feed than mothers who had multiple delivery. It is clear that, economic cost to purchase formula milk, burden of work, to have child health service like immunization, feeding and giving care for single child is easier.

**Conclusion**

The prevalence of infant and young child feeding practice among 0-23months of age children was (62.5%) in the study area and had shown significant variation between irrigated and non-irrigated area. Infant and young child feeding practice is high as compared to studies conducted in different part of Ethiopia among 0-23months of age children. women's decision making, ANC follow up, PNC follow up, attitude of mother/care giver and knowledge of mothers or care giver were identified as significant predictors of infant and young child feeding practice among 0-23months of age children in the study area.

**2. Recommendation**

District health office should give attention for improving ANC follow up and postnatal follow up service with strict IYCF counseling. The districts should also give strong emphasis on health promotion/awareness creation to mothers who have 0-23months of age children to gain knowledge and positive attitude in order to practice IYCF. The district agricultural office gives great attention to extend irrigation schemes for non-irrigated area. In order to improve infant and young child feeding practice the families and the communities would be egger on the issue and understanding the components of IYCF and practicing based health worker recommendations. The families also take/gain information about IYCF from nearby women's development army, health extension worker and health worker. The families and communities also should attend cooking demonstration which is demonstrated by women's development army and by health extension worker at health post to improve IYCF practice. Low prevalence of IYCF can be improved through providing training for health professionals including health extension workers about of IYCF so as to make it their routine works for early starting from pregnancy till 23months of age. The health promotion to IYCF must be given at community level and health facility level for mothers starting from pregnancy to 23months of age children because this times critical period for child development and growth. Therefore, reasonable resources should be allocated for health promotion to improve IYCF. And it need Conduct a research including cultural and behavioral factors.

**References**

1. India Mohafw. Optimal infant and young child feeding practice. 2013.

2. Organization WH. Indicators for assessing infant and young child feeding practices: part 2: measurement. 2010.

3. Unicef. Adopting Optimal Feeding Practices is Fundamental to a Child’s Survival, Growth and Development, but Too Few Children Benefit; UNICEF: New York, NY, USA, 2017.
4. Ethiopi. Ethiopian Demographic and Health Survey. 2016.
5. Organization WH. Infant and young child feeding: model chapter for textbooks for medical students and allied health professionals: World Health Organization; 2009.
6. health EMo. NATIONAL NUTRITION PROGRAM II. 2016.
7. Disha A, Rawat R, Subandoro A, Menon P. Infant and young child feeding (IYCF) practices in Ethiopia and Zambia and their association with child nutrition: analysis of demographic and health survey data. African Journal of Food, Agriculture, Nutrition and Development. 2012;12(2):5895–914.
8. Ahmed KY, Page A, Arora A, Ogbo FA, Maternal G, collaboration CHR. Associations between infant and young child feeding practices and acute respiratory infection and diarrhoea in Ethiopia: A propensity score matching approach. PloS one. 2020;15(4):e0230978.
9. UNICEF. Infant and young child feeding, nutrition section program. New York. 2012.
10. Ethiopia FMoHFHD. NATIONAL STRATEGY FOR INFANT AND YOUNG CHILD FEEDING. 2004.
11. health Emo. National Nutrition Programme 2013.
12. USID. Comprehensive Adolescent, Maternal, Infant and Young Child Nutrition Facilitator's Guide. 2014.
13. Bryce J, Boschi-Pinto C, Shibuya K, Black RE, Group WCHER. WHO estimates of the causes of death in children. The Lancet. 2005;365(9465):1147–52.
14. Organization WH. Global nutrition targets 2025: Stunting policy brief. World Health Organization; 2014.
15. Akombi BJ, Agho KE, Merom D, Renzaho AM, Hall JJ. Child malnutrition in sub-Saharan Africa: A meta-analysis of demographic and health surveys (2006-2016). PloS one. 2017;12(5):e0177338.
16. Belete B, Melak S. Impacts of small-scale irrigation technology on the nutritional well being of children in the Amhara national region of Ethiopia. Ethiopian Journal of Economics. 2018;27(1):29–56.
17. Takahashi K, Ganchimeg T, Ota E, Vogel JP, Souza JP, Laopaiboon M, et al. Prevalence of early initiation of breastfeeding and determinants of delayed initiation of breastfeeding: secondary analysis of the WHO Global Survey. Scientific Reports. 2017;7:44868.
18. Gupta A, Holla R, Dadhich J, Suri S, Trejos M, Chanetsa J. The status of policy and programmes on infant and young child feeding in 40 countries. Health Policy and planning. 2013;28(3):279–98.
19. Gewa CA, Leslie TF. Distribution and determinants of young child feeding practices in the East African region: demographic health survey data analysis from 2008-2011. Journal of Health, Population and Nutrition. 2015;34(1):6.
20. Katepa-Bwalya M, Mukonka V, Kankasa C, Masaninga F, Babaniyi O, Siziya S. Infants and young children feeding practices and nutritional status in two districts of Zambia. International breastfeeding journal. 2015;10(1):5.
21. Na M, Jennings L, Talegawkar SA, Ahmed S. Association between women's empowerment and infant and child feeding practices in sub-Saharan Africa: an analysis of Demographic and Health Surveys.
Public health nutrition. 2015;18(17):3155–65.

22. Demilew YM, Tafere TE, Abitew DB. Infant and young child feeding practice among mothers with 0–24 months old children in Slum areas of Bahir Dar City, Ethiopia. International breastfeeding journal. 2017;12(1):26.

23. Yonas F. Infant and young child feeding practice status and associated factors among mothers of under 24-month-old children in Shashemene Woreda, Oromia region, Ethiopia. Open Access Library Journal. 2015;2(07):1.

24. ICF EEMD. Health Survey, 2019. Key Indicators Rockville, Maryland, USA: EPHI and ICF. 2019.

25. Organization WH. Infant and young child feeding counselling: an integrated course. 2006.

26. Institute IFPR. Global nutrition report: IFPRI.; 2014.

27. Organization WH. Global health observatory data repository. 2013.

28. Kohler H-P. Copenhagen Consensus 2012: Challenge Paper on" Population Growth". 2012.

29. Benin S. Impacts of CAADP on Africa's Agricultural-led Development: Intl Food Policy Res Inst; 2016.

30. Tadele F, editor Towards a More Inclusive Economic Growth and Social Development in Ethiopia: The State of Vulnerable Social Groups and Social Protection. Challenges and Opportunities for Inclusive Development in Ethiopia: Proceedings of Conferences held in 2017; 2019: Forum for Social Studies.

31. IFPRI A. Global nutrition report 2014: actions and accountability to accelerate the world's progress on nutrition. Washington, DC: IFPRI. 2014.

32. Disha A, Tharaney M, Abebe Y, Alayon S, Winnard K. Factors associated with infant and young child feeding practices in Amhara region and nationally in Ethiopia: analysis of the 2005 and 2011 demographic and health surveys. Washington, DC: Alive & Thrive. 2015.

33. Demilew YM. Factors associated with mothers' knowledge on infant and young child feeding recommendation in slum areas of Bahir Dar City, Ethiopia: cross sectional study. BMC research notes. 2017;10(1):191.

34. Khan GN, Ariff S, Khan U, Habib A, Umer M, Suhag Z, et al. Determinants of infant and young child feeding practices by mothers in two rural districts of Sindh, Pakistan: a cross-sectional survey. International breastfeeding journal. 2017;12(1):40.

35. Victora CG, Bahl R, Barros AJ, França GV, Horton S, Krasevec J, et al. Breastfeeding in the 21st century: epidemiology, mechanisms, and lifelong effect. The Lancet. 2016;387(10017):475–90.

36. Doherty T, Sanders D, Jackson D, Swanevelder S, Lombard C, Zembe W, et al. Early cessation of breastfeeding amongst women in South Africa: an area needing urgent attention to improve child health. BMC pediatrics. 2012;12(1):105.

37. Tamir G. Assessment of Optimal Breastfeeding among Working and Stay-at-Home Mothers in Bahir Dar Town Amhara Regional State, North West of Ethiopia: Addis Ababa University; 2010.

38. DEGIE E. OPTIMAL INFANT AND YOUNG CHILD FEEDING PRACTICES AND ASSOCIATED FACTORS AMONG MOTHERS/CREASEAKERS OF CHILDREN AGED 0-23 MONTHS IN NORTH ACHEFER WOREDA, AMHARA, ETHIOPIA, 2019 GC 2020.
39. Tawiah-Agyemang C, Kirkwood B, Edmond K, Bazzano A, Hill Z. Early initiation of breast-feeding in Ghana: barriers and facilitators. Journal of perinatology. 2008;28(2):S46-S52.
40. Group NS. Timing of initiation, patterns of breastfeeding, and infant survival: prospective analysis of pooled data from three randomised trials. The Lancet Global Health. 2016;4(4):e266-e75.
41. Organization WH. Complementary feeding: report of the global consultation, and summary of guiding principles for complementary feeding of the breastfed child. 2003.
42. Ahmed AE, Salih OA. Determinants of the early initiation of breastfeeding in the Kingdom of Saudi Arabia. International breastfeeding journal. 2019;14(1):13.
43. Parashar A, Sharma D, Thakur A, Mazta SR. Infant and young child feeding practices-insights from a cross-sectional study in a hilly state of North India. International Journal of Nutrition, Pharmacology, Neurological Diseases. 2015;5(3):103.
44. Lande MS, Nedberg IH, Anda EE. Factors associated with exclusive breastfeeding at hospital discharge: a study using data from the Georgian Birth Registry. International Breastfeeding Journal. 2020;15:1–10.
45. Wamani H, Åstrøm AN, Peterson S, Tylleskär T, Tumwine JK. Infant and young child feeding in western Uganda: knowledge, practices and socio-economic correlates. Journal of tropical pediatrics. 2005;51(6):356–61.
46. Saaka M, Larbi A, Mutaru S, Hoeschle-Zeledon I. Magnitude and factors associated with appropriate complementary feeding among children 6–23 months in northern Ghana. BMC Nutrition. 2016;2(1):2.
47. Berde AS, Yalcin SS. Determinants of early initiation of breastfeeding in Nigeria: a population-based study using the 2013 demographic and health survey data. BMC Pregnancy and Childbirth. 2016;16(1):32.
48. Bentil HJ, Steiner-Asiedu M, Larney A. Comparison of the complementary feeding practices between mothers with twins and mothers with singletons. The Pan African Medical Journal. 2016;24.
49. Jama A, Gebreyesus H, Wubayehu T, Gebreyorgis T, Teweldemedhin M, Berhe T, et al. Exclusive breastfeeding for the first six months of life and its associated factors among children age 6-24 months in Burao district, Somaliland. International breastfeeding journal. 2020;15(1):5.
50. Taye B. Caregivers Perception, Values and Challenges on Infant and Young Child Feeding in Addis Ababa: Addis Ababa University; 2016.
51. John JR, Mistry SK, Kebede G, Manohar N, Arora A. Determinants of early initiation of breastfeeding in Ethiopia: a population-based study using the 2016 demographic and health survey data. BMC pregnancy and childbirth. 2019;19(1):69.
52. Roba KT, O’Connor TP, Belachew T, O’Brien NM. Infant and young child feeding (IYCF) practices among mothers of children aged 6–23 months in two agro-ecological zones of rural Ethiopia. Int J Nutr Food Sci. 2016;5(3):185–94.
53. Solomon D, Aderaw Z, Tegegne TK. Minimum dietary diversity and associated factors among children aged 6–23 months in Addis Ababa, Ethiopia. International journal for equity in health.
54. Forsido SF, Kiyak N, Belachew T, Hensel O. Complementary feeding practices, dietary diversity, and nutrient composition of complementary foods of children 6–24 months old in Jimma Zone, Southwest Ethiopia. Journal of Health, Population and Nutrition. 2019;38(1):14.

55. Kebede Z. Determinants of optimum breastfeeding among mothers of child less than two years in Bishoftu town, east Shewa zone of Oromia region, Ethiopia. Science Journal of Public Health. 2015;3(4):544.

56. Sasie S, Oljira L, Demena M. Infant and young child feeding practice and associated factors among mothers/caretakers of children aged 0–23 months in Asella Town, South East Ethiopia. Journal of Family Medicine. 2017;4(5).

57. Tewabe T, Mandesh A, Gualu T, Alem G, Mekuria G, Zeleke H. Exclusive breastfeeding practice and associated factors among mothers in Motta town, East Gojam zone, Amhara Regional State, Ethiopia, 2015: a cross-sectional study. International breastfeeding journal. 2016;12(1):12.

58. Beletew B, Gebremichael B, Tesfaye T, Mengesha A, Wudu M. The practice of key essential nutrition action messages and associated factors among mothers of children from birth up to 2 years old in Wereilu Wereda, south Wollo zone, Amhara, Northeast Ethiopia: a community based cross-sectional study. BMC pediatrics. 2019;19(1):459.

59. Wang L, Van Grieken A, Van Der Velde LA, Vlasblom E, Beltman M, L'Hoir MP, et al. Factors associated with early introduction of complementary feeding and consumption of non-recommended foods among Dutch infants: The BeeBOFT study. BMC public health. 2019;19(1):388.

60. Nkrumah J. Maternal work and exclusive breastfeeding practice: a community based cross-sectional study in Efutu Municipal, Ghana. International breastfeeding journal. 2016;12(1):10.

61. Senghore T, Omotosho TA, Ceesay O, Williams DCH. Predictors of exclusive breastfeeding knowledge and intention to or practice of exclusive breastfeeding among antenatal and postnatal women receiving routine care: a cross-sectional study. International breastfeeding journal. 2018;13(1):9.

62. Mohamed MJ, Ochola S, Owino VO. Comparison of knowledge, attitudes and practices on exclusive breastfeeding between primiparous and multiparous mothers attending Wajir District hospital, Wajir County, Kenya: a cross-sectional analytical study. International breastfeeding journal. 2018;13(1):11.

63. Temesgen H, Negesse A, Woyraw W, Mekonnen N. Dietary diversity feeding practice and its associated factors among children age 6–23 months in Ethiopia from 2011 up to 2018: a systematic review and meta-analysis. Italian journal of pediatrics. 2018;44(1):1–10.

64. Chekol DA, Biks GA, Gelaw YA, Melsew YA. Exclusive breastfeeding and mothers’ employment status in Gondar town, Northwest Ethiopia: a comparative cross-sectional study. International breastfeeding journal. 2017;12(1):27.

65. Adugna B, Tadele H, Reta F, Berhan Y. Determinants of exclusive breastfeeding in infants less than six months of age in Hawassa, an urban setting, Ethiopia. International breastfeeding journal. 2017;12(1):45.
66. Abera K. Infant and young child feeding practices among mothers living in Harar, Ethiopia. Harar Bulletin of Health Sciences. 2012;4:66–78.
67. Aguayo VM, Gupta G, Singh G, Kumar R. Early initiation of breast feeding on the rise in India. BMJ Global Health. 2016;1(2).
68. Eshete T, Kumera G, Bazezew Y, Mihretie A, Marie T. Determinants of inadequate minimum dietary diversity among children aged 6–23 months in Ethiopia: secondary data analysis from Ethiopian Demographic and Health Survey 2016. Agriculture & Food Security. 2018;7(1):66.
69. Mengesha MG. Knowledge, Attitude, and Practice of Women towards Exclusive Breastfeeding and Mixed Feeding in Gubalafto Woreda, Amhara Regional State, Ethiopia: Addis Ababa University; 2014.
70. Puspitasari MD, Gayatri M. Indonesia Infant and Young Child Feeding Practice: The Role of Women’s Empowerment in Household Domain. Global Journal of Health Science. 2020;12(9):129-.
71. Girma S, Alenko A. Women’s Involvement in Household Decision-Making and Nutrition Related-Knowledge as Predictors of Child Global Acute Malnutrition in Southwest Ethiopia: A Case–Control Study. Nutrition and Dietary Supplements. 2020;12:87–95.
72. Saaka M. Women’s decision-making autonomy and its relationship with child feeding practices and postnatal growth. Journal of Nutritional Science. 2020;9.
73. Ickes SB, Wu M, Mandel MP, Roberts AC. Associations between social support, psychological well-being, decision making, empowerment, infant and young child feeding, and nutritional status in Ugandan children ages 0 to 24 months. Maternal & child nutrition. 2018;14(1):e12483.
74. Solomon D, Zewdie Aderaw, and Teketo Kassaw Tegegne. Minimum dietary diversity and associated factors among children aged 6–23 months in Addis Ababa, Ethiopia. 2017.
75. woreda D. demographic health information. 2020.
76. Awulachew SB. Irrigation potential in Ethiopia: Constraints and opportunities for enhancing the system. Gates Open Res. 2019;3.
77. Organization WH. Indicators for assessing infant and young child feeding practices: part 1: definitions: conclusions of a consensus meeting held 6-8 November 2007 in Washington DC, USA: World Health Organization; 2008.
78. Coates J, Swindale A, Bilinsky P. Household Food Insecurity Access Scale (HFIAS) for measurement of food access: indicator guide: version 3. 2007.

**Table 1**

Table 1 is not available with this version