

Infant and Young Child Feeding Practices and Associated Factors in Benishangul Gumuz Regional State, North West, Ethiopia

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Abstract: Introduction: In the world more than 10 million children die annually each year, in which 41% of these deaths occur in sub-Saharan Africa. In Benishangul Gumuz Regional state the infant and under-five children mortality rate were the highest among all other regional state of Ethiopia with 101 and 169 respectively. Introduction of complementary food during infancy is an important area of pediatric health supervision due to its potential effects on life-long health. Objective: assessment timely introduction of complementary feeding practice and associated factors among mothers of children age less than two years. Methods: Both quantitative and qualitative community-based cross-sectional study were conducted in seven woreda of Benishangul Gumuz Regional state on 590 infant paired mothers less than two years using simple random sampling. Data was coded, edited, entered into Epi-Info version 3.5.1 and analyzed by using SPSS version 20.0. Both descriptive and multivariable logistic regressions were used for data analysis. Results: A total of 770 women were participated with a response rate of 97.7%. The prevalence of timely introduction of complementary feeding practice was 73.9% respectively. Being Male sex [AOR=1.48(1.00-2.18)], who fulfill minimum dietary diversity [AOR=2.87(1.34-6.13)], having adequate knowledge about timely introduction complementary feeding [AOR=2.61(1.20-5.61)], were independently associated with timely introduction of complementary feeding practice. Conclusion: Although the study revealed that majority of the mothers practice timely introduction of complementary feeding but some mothers started complementary feeding before 6 month. Optimized efforts for implementing the full IYCF especially on timely introduction of complementary feeding packages will be done through the front line workers. Factors associated with early initiation of complementary food should be taken into account while designing intervention strategies and in promotion of strong community based networks using Health Extension Workers key actors.

Keywords: Timely Introduction of Complementary Feeding, Infant and Young Child Feeding, Mothers, Ethiopia

1. Introduction

Nutrition is essential for children's health and development [1]. Adequate nutrition during infancy and early childhood is fundamental to the development. It is well recognized that the period from birth to two years of age is a "critical window" for the promotion of optimal growth, health and behavioral development [2]. In the world sixty percent of the infant and young child deaths occur due to malnutrition where two-thirds of these deaths attributed to sub-optimal child feeding practices and infectious disease [3]. The impacts of inappropriate infant feeding practice are great in

developing countries [4]. Improving infant and young child feeding (IYCF) practices has been identified as a fundamental intervention to deal with the suboptimal nutritional status of children less than two years of age in resource-limited countries [5].

WHO and UNICEF recommend that mothers breastfeed infants exclusively for the first six months and continue to breastfeed for two years and beyond, together with nutritionally adequate, safe, age-appropriate, responsive feeding of solid, semi-solid and soft foods starting in the

sixth month [7]. Timing of the first introduction of solid food during infancy have an important effects on life-long health [8]. Timely introduction of complementary feeding practice tops the table of life-saving interventions for new-borns [9, 10]. The poor nutritional status of children and women continues to be a serious problem in Ethiopia. The health sector has increased its efforts to enhance good nutritional practices through health education, treatment of extremely malnourished children, and provision of micronutrients to mothers and children. In Benishangul Gumuz specially there is no research conducted to indicate the extent of the problem in the society but only EDHS 2011 reports on infant and young child feeding is available. Therefore, the aim of this study was to assess timely introduction of complementary feeding practice and associated factors among mothers of children age less than two years in study area.

2. Methods and Materials

2.1. Study Area and Period

The study was conducted in Benishangul Gumuz Regional State, North West Ethiopia. The Region consists of three zones (Assosa, Metekele and Kamashi), one special woreda (Maokomo) and Assosa city administration. Based on the data from regional health bureau the total population of the region is 993,584. Benishangul Gumuz Regional state consists 36 health centers, 398 health post, and 2 hospitals. Beside this the region also has one University located in Assosa the capital city of the region which is located 661 kilometres (k.ms) Northwest of Addis Ababa and one Health science college in Pawe woreda. The study was conducted in Bullen, Mandura, Assosa, Homosha, Kamashi, Bello And Maokomo woreda on atotal of 46 roddomly selected kebeles from April 20-29/2015.

2.2. Study Design

A community-based cross-sectional study supplemented by qualitative study was used.

2.3. Population

2.3.1. Source Population

- *For quantitative study:* All infant paired mothers living in BG Region.
- *For qualitative study:* All infant paired mothers, community and religious leaders in the region.

2.3.2. Study Population

- *For the Quantitative method:* All infant paired mothers randomly selected woreda and kebele.
- *For qualitative study:* All infant paired mothers, community and religious leaders randomly selected from each kebele.

2.4. Inclusion and Exclusion Criteria

Since the study subjects are mother-infant paired groups, mothers whose infant age less than two year were included as study population. Mothers with infants who are seriously ill

and unable to communicate from any cause were excluded from the study.

2.5. Sample size and Sampling Procedure

2.5.1. Sample size Determination

The quantitative sample size for this particular study will be calculated using formula for a single population proportion considering the following assumptions.

$$n = (Z_{\alpha/2})^2 p (1-p) d^2$$

Where: n = required sample sizes

$Z_{\alpha/2}$ = critical value for normal distribution at 95% confidence level which equals to 1.96

P = (42.2%) prevalence of early initiation of breastfeeding of BGRS, EDHS 2011.

d = an absolute precision (margin of error 5%).

Using the above formula $n = (1.96)^2 0.422 (1-0.422) (0.05)^2$

n = 375 mothers with infants.

Using Design Effect of 1.5 then sample size become 562.

Adding 5% of non-respondent the final sample becomes 590.

- For qualitative study
10 focused group discussions (FGDs) on mother-infant/child pair and 20 in-depth interviews on community and religious leaders were conducted until the saturation of idea reached in all purposively selected woreda.

2.5.2. Sampling Procedure

- For quantitative study
There are 20 woreda and one administrative town in Benishangul Gumuz Regional state. The sampling procedure of this study was started by using classification of the 20 woreda and one administrative town into strata since population of each woreda is known to have heterogeneity with regard to infant and child feeding practice. The total populations size of infant-paired mothers with age less than two years found in each woreda were calculated using the conversion factors and again proportionally allocated sample size for each woreda were reallocated to their respective urban and rural kebele proportionally. Finally the total of 788 study participant were selected using simple random sampling methods for this purpose health extension workers were assisted the data collectors as a guider in locating where mother-infants pairs were found.

2.6. Data Quality Control

The quality of the data was assured through careful design, translation, retranslation and pre-test of the questionnaire. The questionnaire was adopted in English from different literature and translated into Amharic and then back into English by experts. Pre-testing was done 10 days prior to actual data collection nearby Kebele. The participants in this sample pre-test kebele were not included in the study.

Data collectors and supervisors were trained for one day. The principal investigator and the supervisors were checked the collected data for completeness and corrective measures were taken accordingly. The collected data were cleaned, coded and explored before.

2.7. Data Collection Methods

2.7.1. Data Collection Instrument

Data were collected using semi-structured and interviewer guided questionnaire adopted from related studies and EDHS. The questionnaire adopted were modified and contextualized to the local situation and the research objective after pre testing. Open-ended questionnaire were also used for Focused Group Discussion and in-depth interview.

2.7.2. Data Collector Training and Pre-Testing

Health care providers (who understand, speak and write the local language) were used as data collectors. They were trained for one day by the principal investigator on the objective of the study, data collection tools and sampling procedures.

Before the actual data collection, the questionnaire was pre-tested on a similar kebele which were not included in the study. Amendments on the questionnaire were made accordingly after the pre-test.

2.7.3. Data Collection Process

After identifying the study subjects with random selection infant paired mother, face to face interview data collection method was employed. To maximize the data quality obtained by the use of semi- structured questionnaires FGDs were undertaken in group of infant paired mother. Each FGD were consisting of minimum of six members. The members of each FGD were selected by principal investigator (Researcher) or supervisors. FGD were moderated by Principal investigators/supervisors and translator who able to speak, hear and write local languages.

2.8. Data Processing and Analysis

Data, the data was checked for completeness and entered in to Epi-Info version of 3.1 then it was exported to SPSS version 20.0. Descriptive statistics was calculated to describe the overall distribution of the study subject with the variables under study. Bivariate and multivariable logistic regression analyses were used to determine the presence of statistically significant associations between outcome and the independent variables. The strength of association was measured by adjusted odds ratios and 95% confidence intervals using multivariate analysis. Statistical significance were declared at $P < 0.05$. Finally the result was presented in tables and graphs.

For qualitative data, data was transcribed in to an English text by the principal investigator from the note and by replaying the tape recorder. The different ideas in the text were merged in their thematic areas and thematic framework analyses were employed to extract meanings out of the texts manually. Then finally results were presented in narratives in triangulation with quantitative data.

2.9. Study Variables

2.9.1. Dependent Variable

- Timely introduction complementary feeding at 6 month(yes/no)

2.9.2. Independent Variable

- Socio-demographic and economic characteristics: (age, sex, marital status, residence, occupation, educational status, ethnicity, religion, and monthly income). Socio-cultural factors: (provide butter for new born infants, discarding the first milk, giving water for new born before breast feed). Maternal related factors/practice: (use of ANC service, use PNC services, place of delivery, access to health care, access to health information, Knowledge). Obstetrics and Medical factors: (Breast illness, Mode of delivery, Gastroenteritis, respiratory infections).

3. Ethical Consideration

The approved proposal got ethical clearance from Ethical Review Committee OF Benishangul Gumuz Regional Health Bureau, and then submitted to both zonal and woreda health bureau where study is conducted. The study participants were informed about the purpose of the study and finally their oral consent were obtained before interview. They also notified that the information provided by each respondent was kept confidential with assurance of the right to refuse or terminate the interview at any point.

4. Result

4.1. Socio-Demographic Characteristic of the Respondents

568 respondents were provided accurate information with a response rate of 96.3%. All of the respondents were between the age group of 16-40 years with the mean age of 25.5 ± 5.2 years.

Table 1. Socio-demographic related variables of infant paired mothers (n=568) in Benishangul Gumuz regional state Northwest Ethiopia, 2007.E. C.

Variables	Frequency (n=568)	%
Age		
<20 years	57	10.0
20-29 years	369	65.0
30-39 years	133	23.4
= >40 years	9	1.6
Residence		
Rural	456	80.3
Urban	112	19.7
Religion		
orthodox	196	34.5
Muslim	288	50.7
protestant	79	13.9
catholic	5	0.9

Variables	Frequency (n=568)	%
Ethnicity		
Berta	178	31.3
Amhara	113	19.9
Gumuz	97	17.1
Oromo	60	10.6
Shinasha	48	8.5
Agew	29	5.1
Mao	28	4.9
Komo	8	1.4
Tigre	7	1.2
Marital status		
single	26	4.6
married	519	91.4
divorced	17	3.0
widowed	6	1.0
Educational status		
Unable to Read & Write	278	48.9
Able Read & Write	42	7.4
Grade 1-4	75	13.2
Grade 5-8	113	19.9
Grade 9-10	31	5.5
Grade 10 + college	13	2.3
Degree and above	16	2.8
Occupational status		
Farmer	314	55.3
Housewife	175	30.8
Merchant	32	5.6
Government Employee	26	4.6
Student	15	2.6
Daily Labor	6	1.1
Income in month		
<=1000 birr	427	75.2
1001-2000birr	94	16.5
2001-3000birr	24	4.2
>3000birr	23	4.1

4.2. Obstetrics Characteristics and Knowledge of the Respondents

Among a total of study participants 512 (90.1%) mothers had attended ANC for their last birth. 267 (47.0%) were delivered at health institution. The proportions of mothers

who assisted delivery at home by NTTBA, TTBA, alone, were 5.8%, 11.4% respectively. Five hundred 372 (65.5%) of the respondents were informed about breast feeding practice during ANC service.

Table 2. Obstetrics and knowledge related variables of infant paired mothers (n=568) in Benishangul Gumuz regional state Northwest Ethiopia, 2007.E. C.

Variables	Frequency (n=568)	%
ANC follow up		
No	56	9.9
Yes	512	90.1
Parity		
Para One	196	25.5
Para Two And Above	574	74.5
Number of ANC Follow up		
Zero visit	56	9.9
1-4 visit	210	36.9
Greater than 4 visit	302	53.2
Place of delivery		
Home	301	53.0
Institution	267	47.0
Mode of delivery		
Normal vaginal delivery	548	96.5
Cesarean section	17	3.0
Instrumental delivery	3	0.5
Delivery assisted by		
Health professional	274	48.2
TTBA	33	5.8

Variables	Frequency (n=568)	%
NTTBA	65	11.4
Alone	36	6.4
Family	160	28.2
Informed about feeding practice during ANC follow up		
No	196	34.5
Yes	372	65.5

4.3. Infant and Young Child Complementary Feeding Practice

A total of 420 (73.9%) mothers had timely introduced complementary feeding practice at six months. Majority of women 319 (57.9%) were feed their young child 2-5 times in

the last 24 hours but 17 (3.1%) of the mothers were feed their young child only once in the last 24 hours. Among the study participants 152 (20.2%) mothers gave more than three food items in the last 24 hours. 29.6% of mothers feed iron reach/meat product in the last 24 hours.

Table 3. Infant and young child feeding practice in Benishangul Gumuz regional state 2007.E. C.

No	Variables	Frequency	%
1	Timely introduction of complementary feeding at 6months	420	73.9
2	introduction of solid, semi-solid or soft food at 6-8 months	469	82.6
3	Minimum Meal diversity intake in the last 24hours		
	Only One Type Food Item	285	51.6
	Three Type Food Item	152	27.5
	Greater than three Type of Food Item	115	20.9
4	Iron reach food/meat intake in the last 24hours	168	29.6
5	semi-solid or soft food intake in last 24hours	551	97.0
6	Meal Frequency intake in last 24hours		
	once a day	17	3.1
	2-3 times a day	117	21.2
	4-5 times a day	202	36.7
	=>6 times a day	215	39

4.4. Factors Associated with Timely Introduction of Complementary Feeding Practice

From the bivariate analyses variables that fulfilled the minimum requirement 0.2 level of significance in this study were entered in to multivariate logistic analysis. The multivariate logistic regression which controls the effect of confounding variables was used by taking all covariates into account simultaneously for timely introduction of Complementary feeding practice. Multi-logistic regressions showed that the present parsimonious model adequately fits the data for timing introduction of Complementary feeding practice as P- value from Hosmer and Lemeshow test was 0.590. After applying bivariate and multi-logistic regressions,

four variables were found to be significantly associated with timely introduction of Complementary feeding practice. Those who delivered male were about one point five times more likely introduce timely complementary than who delivered female [AOR=1.45(1.01-2.2.18)], mothers who had adequate knowledge about breast feeding (AOR=2.61) and mothers who had adequate knowledge about exclusive breast feeding practice(AOR= 1.17) were more likely introduce complementary on time as compared to counterpart. On the other hand mothers who had ANC follow up were not associated with timely Introduction of Complementary feeding practice. (The results of Bivariate and multivariate analysis were summarized in Table below.)

Table 4. Factors associated with timely Introduction of Complementary feeding practice (n=568) in Benishangul Gumuz regional state Northwest Ethiopia, 2007.E. C.

Explanatory Variable	Timely introduction of Complementary feeding practice				
	No	Yes	Crude OR(95% CI)	P-value	Adjusted OR(95% CI)
Child sex					
Male	65	231	1.56(1.07-2.28)*	0.05	1.48(1.01-2.18)**
Female	83	189	1		1
Breast feeding program					
Not on program	65	96	1	0.00	1
On program	83	324	2.68(1.78-3.93)*		2.6(1.74-3.91)**
ANC follow up					
No	19	37	0.66(0.36-1.18)	0.39	0.76(0.41-1.41)
Yes	129	383	1		1
breast feeding in last 24hours					
Less than 8 times a day	40	97	0.8(0.53-0.99)*	0.13	0.2(0.68-1.54)
8 times and above	108	323	1		1

minimum dietary greater or equal to 4					
No	88	348	1	0.00	1
Yes	9	105	2.95(1.94-6.06)*		2.87(1.34-6.13)**
Knowledge about importance of breast milk					
inadequate knowledge	73	143	1	0.01	
adequate knowledge	75	277	1.88(1.29-2.76)*		2.61(1.20-5.61)**
Knowledge about exclusive breast feeding practice					
No	19	26	1	0.48	1
Yes	129	394	2.23(1.20-4.17)*		1.17(0.75-1.83)

5. Qualitative Result

“Thematic frame work analysis” was used for sorting transcribed information, looking for patterns, similarities, differences or contradictions. The results of qualitative parts were summarized in three parts as follows. Regarding the results of FGD and In-depth interview on breastfeeding practice all mothers those participated in the FGD in the five woreda stated that breastfeeding is widely practiced in their residential area and they believe it is important for normal child development, strength and health. They also stated that timely introduction of complementary food on the top.

Timely introduction of complementary feeding: all mothers from all study area verbally agreed that child should exclusively breastfeed up to six month but practically most of them do not practice, some of mothers reported that the time they spend at home affects the duration of Exclusive breast feeding. Some reported that when they go away from home for collecting fire wood which is found in far away, fetching water in rural areas and leave home for a work in case of gov't workers, the child will not breastfed exclusively.

Mother from Kamashi urban kebele said “Even though I know that exclusive breast feeding should be started 6 months, my child should not die do to starvation when I go for work as I am government worker”.

One of the mothers from Homosha expressed her experience for not exclusively breastfed as: “....the problem is that since we are farmer most of our time spent on working outside home, we leave home for a work early in the morning then we come back home some times in the evening. So the infant couldn't get enough breast milk to be fed and instead infants will be given other than breast milk at least 2 up to 3 times even more feed per day.”

One of the mothers from Maokomo expressed her feeling for not exclusively breastfed as: - “Culturally, when infants reach 4 months of the age, we believe that the child start to smell the food during food preparation and feeding. During this time we assume that child needs food to eat. To alleviate the child's hunger from the smell of the food, we are start soon feeding the infants.”

Frequency of breast feeding is not uniform among mothers. Majority of the discussant reported that they did not breast feed their child on accounting basis rather they breastfed them only when they cries while they are at home. Most of the mother did not member exactly how many times they feed their child but almost all of mother reported that it is more than 5-8 times per 24hours.

The duration of EBF range from 3-6 month. When the child is not breastfed exclusively the type of food that is given for the child instead in Homosha is a traditional food of “Bertha” which called “Gidegn” which is prepared from corn and sorghum and cooked as porridge and soup. This food is given by the person in charge of caring the baby while mothers leave home for work.

Among mother participated on FGD in Mao-komo the type food given Habish (fenugreek), milk, porridge and muk (soup). In Kamashi even though most mothers are believe on exclusive breast feeding, still there are mothers who begin providing water after 3 months, some mothers start at 5 months of age with food type like Soft porridge, Kenkes (local foods), soft drink mixed with water (lesilasa), egg, banana.

Most of the participant from the study area low economic condition, life style, type of occupation is some of the barriers to exclusive breast feeding. Participant from other study area specially of Abrhamo verbalize factor that act as barriers to exclusive breastfeeding in the past were misconception in which breastfeeding alone may not enough for normal child growth, strength and child will not become fat hence the family provides soup, water and others food type earlier of the infant age.

Now days they receive counseling on child feeding from health professional and HEW and they understand breast milk is enough for the child feeding requirements because at this age child's stomach will not be able to digest other food type below the age 6 month.

Complementary (solid semi solid and soft food) feeding:- Some mothers thought it was impossible to introduce complementary food at the recommended age of 6 months because of economic reasons, work condition of the mother whether in urban or rural and cultural practice and also still participants had different opinions on the appropriate time to start introducing solid, semi-solid and soft food to the child, ranging from 3 months to 9, some of mothers reported that they had started giving foods at 6 months or earlier. Those who stated they prefer to give food earlier than 6month believe that the food is important for the child's growth, strength and breast milk alone is not enough for the child. Likewise, during interviews, it was found that the age for introduction of additional foods ranged from 3 to 8 months.

Most of the mother stated that appropriate age to start solid, semi-solid and soft food for infants are exactly at 6 month and still some state before 6 month and above. During the time to start feeding infants, most of the mothers start with soft food or porridge and gradually increase to solid

food. The frequency of the meal given for the infants per day also ranges from 3-6 times based upon infants need for food. Still some mother did not count the number of feeding rather than feeding infants when the infant needs it.

The type of food that is given for infants during the initiation of solid, semi-solid and soft foods are determined by culture of the community, socio-economic condition and knowledge on how and what to feed infants. Accordingly mothers from Homosha feed their infants, cow milk, soup prepared from corn and sorghum after 1 year they start to feed eggs and traditional food called "Gidegn" which prepared from corn and sorghum that will be cooked as porridge which will be fed by mothers or the person who are in charge of taking care for the baby while mother left home for work.

The reports from community leaders and religious leaders conforms with reports of the mothers and also adding that there is no practice whether in regions or culturally that discourage good infant feeding beside to breast feeding infants up to 2 years of age.

Mothers those participated in the study from rural kebele of Assosa Woreda (Abrahamo) has mentioned food items like soup, porridge with "Kenkes" which a traditional foods widely consumed by Bertha and other ethnic group, red teff, pea, bean, mashed (carrots, potatoes, pumpkin and cabbage) and other fruits based on the need of the infants.

Mothers from urban kebele of Kamashi Woreda expressed the food items that is given when infants reached 6month of age is the one which is easily digestible like milks, soft porridge with "Kenkes" and they gradually increase the amount and solidity of the porridge. From discussion it is also understood that some mothers stated that they feed their infants a child's food made in factory like formula milks (Cerafum), and also soft drinks.

The same response has been made by community and religious leaders regarding the type of food items that the infants eat stating that from religious wise there is no documentation on the age at which solid, semi- solid and soft food is given for the child.

On the other hands mothers from Dobi kebele of Bullen Woreda explained during the time of introduction of solid, semi- solid and soft food they start to feed their child food items like Gonfo (porridge) with sedo, boreidi (which made from germinated corn, barley sorghum), Injera, Atmit (soup) made from bekolo (Corn), sindae (wheat), tef, sugar, caw milk mixed with water.

One of the mothers from Dobi kebele of Bullen Woreda stated introduction of solid semi, solid and soft food as follows: " I started introduction of solid, semi-solid and soft food for my infant at six month and during this time the food items I start for the infant was Gonfo (porridge) with sedo, boreidi(which made from germinated corn, barley sorghum), Injera, Atmit (soup) made from bekolo (corn), sindae (wheat), tef, sugar, caw milk"

During the discussion majority of the mothers respond that the quantity of food items the child fed is determined by the satisfaction level of the infant during his meal time rather

than predetermined amount.

Mothers with infants recruited for FGD in Maokomo also stated that the type of supplementary food items to be given for the infant during the time infants start feeding is not set by culture rather it is based on the available food items at home. Mostly porridge, milk, muk (soup), merek, eggs, Enjera with Wot was given to infants for feeding.

The report from community leaders and religious leaders support the point that the mothers raised during discussion on type of food given and also added that the infants will be breast fed up to 2 years of age while the infants fed extra food items.

6. Discussion

Ninety-nine percent of mothers had ever practiced breastfeeding which is almost similar to the national ever breastfeeding rate (96%). Regarding complimentary feeding results of this study showed that the prevalence of mothers those who timely introduce complementary food to their infants at the age of 6 months were 569 (73.9%). This finding is higher as compared to the study conducted in Nekemte which was 55.4% [35], the report of EDHS 2011 which is 49% but lower as compared to Abyi-Adi town of Tigray region which 79.7% [32]. This may be due to total sample size used, scope of the study and the work of health extension on health information dissemination infant feeding practice.

The results of the qualitative part of this study also confirmed that the majority of the mothers believe the right age of introducing complementary food was 6 month but those start below this age gave economic status, work condition and knowledge of the mothers as a factor for not doing so. From the total of study participant, 551 (97.0%) of them were respond that they fed their infants complementary food during the day preceding the study. Only 115 (20.9%) of the infants were fed with minimum dietary diversity (≥ 4) food groups. The qualitative part of this study showed that even though mother fed their infants different food items during introduction of complementary food, majority of mothers did not maintain minimum dietary diversity which is in line with quantitative finding. This finding is higher compared to the conducted in rural Sidama of southwest Ethiopia were 14.4% of the children fed with complementary diet of minimum dietary diversity (≥ 4) during the preceding day of the study [33] and report of EDHS 2011 which is 5.3%. Regarding the factors associated with timely introduction of complementary among the all variable entered in to multivariate for analysis only sex of the infants, minimum dietary ≥ 4 food group, Knowledge about function of breast milk, Knowledge about exclusive, breast feeding practice and Breast feeding practice were found to be significantly associated with it.

In this study mothers who had male children were about 1.5 times more likely introduce complementary food than those mothers who had female child [AOR= 1.48(1.00-2.18)]. On the other hand this finding is in line with study done in Nairobi Kenya [43]. This might be due to sex bias on

feeding where more priority or respect is usually given to males than females.

Mothers whose Infants received minimum dietary diversity ≥ 4 food group were found to be 3 times more likely to introduce complementary food at 6 month for their infants compared to mothers whose infants received less than 4 food group AOR=2.87, 95%CI= (1.34-6.13). From qualitative part of this study the, majority of the mothers involved in FGD and both community and religious leaders those who introducing complementary food for their infants were done at the 6 month were also gave more than four food groups with frequency of more than 4 specially when they leave home for a work. This shows that more was done on the community regarding infant feeding practice more specifically by health extension workers which are confirmed during FGD and in-depth interview with the community.

Mothers those who had Knowledge about breast feeding practice were found to two times more likely to introduce complementary food at 6 month for their infants compared to those who has not [AOR=2.61, 95% CI= (1.20-5.61)]. During discussion with mothers, religious and community leaders it is confirmed that those who exclusively breast fed their infants were introduce complementary food at 6 month for their infants and they also clearly state the importance of exclusive breastfeeding and introduction complementary food at 6 month. This result is similar with the finding of done in Abyi-Adi town of Tigray regions [32]. This may be due to the fact health extension workers and voluntary community health agents close relationships, follow up and Supports of breast feeding mothers which approved during discussion.

Mothers those who breast feeding on program were found to 6 times more likely to introduce complementary food at 6 month for their infants compared to those who has not [AOR=5.61, 95% CI= (3.56-9.34)]. Mothers participated in FGD, community and religious leaders participated in in-depth interview specially of rural areas reported that, mothers breast fed their infant when infant needs and cry rather in addition to breast feeding on program. This may be due to adequate knowledge transferred to the mothers on infant and young child feeding by health extension workers and repeated IYCF promotion using media.

7. Conclusion

Although the study revealed that majority of the mothers practice timely introduction of complementary feeding. But some mothers started complementary feeding before 6 month. It was found that being male sex, minimum dietary diversity ≥ 4 food group, Knowledge about breast feeding practice and exclusive breast feeding practice were positively associated with this study. Therefore, this study recommend: to accelerate the momentum in place on implementing the IYCF especially on timely introduction of complementary feeding practice, Factors associated with complementary feeding found in this finding should be taken into account while designing intervention strategies

and in promotion of strong community based networks using Health Extension Workers as a key actors, consider the importance of including nutrition education in educational system of the country with the special focus on IYCF, Enhance the support for government initiatives that invest in IYCF especially on timely introduction of complementary feeding practice. The limitation of this study: This cross sectional study by its very nature cannot establish cause and effect relationship. Variable like early initiation of breast feeding could be subject to recall bias, and knowledge of mother about feeding practice was based on mother's response.

References

- [1] World Health Organization, 2010. Indicators for assessing infant and young child feeding practices, Part 3.
- [2] Pan american health organization, World Health Organization 2001. Division of Health Promotion and Protection Food and Nutrition Program Guiding principles for complementary feeding of breast fed child.
- [3] UNICEF. Global Strategy for Infant and Young Child Feeding, Geneva, Switzerland. 2003.
- [4] WHO. Report of the global consultation on Summary of guiding principles for complementary feeding of the breastfed child, Geneva Switzerland. 2001
- [5] World Health Organization: Infant and young child feeding: model chapter for textbooks for medical students and allied health professionals. France: World Health Organization; 2009.
- [6] CDC, Division of Nutrition and Physical Activity 2007. Does breast feeding reduce the risk of pediatric over weight? Research to Practice Series, No. 4.
- [7] World Health Organizations. Global Strategy for Infant and Young Child Feeding. World Health Organization; Geneva. 2003.
- [8] Alice A. Kuo, Moira Inkelas, Wendelin M. Slusser, Molly Maidenberg, Neal Halfon. Introduction of Solid Food to Young Infants. *Maternal Child Health J.* 2011, 15:1185–1194.
- [9] Central Statistical Agency [Ethiopia] and ORC Macro 2006.
- [10] Ethiopian Demographic Health Survy 2005,
- [11] WHO/UNICEF. Global Strategy for Infant and Young Child Feeding. 2006.
- [12] World Health Organization. Learning from large-scale community-based program to improve breastfeeding practices. 2008.
- [13] World Health Organization. Mortality and burden of disease attributable to selected major risks. 2009.
- [14] World Health Organization. Infant and young child feeding (IYCF).Chapter for textbooks for medical students and allied health professionals. 2009.
- [15] UNICEF: Progress for children. A world fit for children. Statistical Review, New York. 2007 (6).

- [16] Black RE, Allen LH, Bhutta ZA, Caulfield LE, Onis Md, Ezzati M, et al. Maternal and child under nutrition: global and regional exposures and health consequences. 2008.
- [17] Labbok MH, Wardlaw T, Blanc A, and Clark D, Terreri N. Trends in exclusive breastfeeding. *J Hum Lact.* 2006, 22: 272–276.
- [18] Pan American Health Organization and WHO, Guiding Principles for Complementary Feeding of the Breastfed Child, Pan American Health Organization, Washington, DC, USA; WHO, Geneva, Switzerland, 2003.
- [19] S. K. Roy, S. P. Jolly, S. Shafique et al. Prevention of malnutrition among young children in rural Bangladesh by a food health- care educational intervention: a randomized, controlled trial. *Food and Nutrition Bulletin.* 2007, 28(4): 375–383.
- [20] K. G. Dewey and S. Adu-Afarwuah, “Systematic review of the efficacy and effectiveness of complementary feeding interventions in developing countries. *Maternal and Child Nutrition.* 2008, 4(1):24–85.
- [21] Alice A. Kuo, Moira Inkelas, Wendelin M. Slusser, Molly Maidenberg, Neal Halfon. Introduction of Solid. *Maternal child J.* 2011, 15: 1185-1194.
- [22] Dyah Ayu Inayati, Veronika Scherbau m, Ratna Chrism iari Purwestri, Elizabeth Hormann, Nia Novita Wirawan, Julia Surya ntan etal. Infant feeding practices among mildly wasted children: a retrospective study on Nias Island, Indonesia. *International Breastfeeding Journal* 2012, 7:3.
- [23] Sultana S, Hoque A, Saleh F. Infant and Young Child-feeding Practices and their Nutritional Status in a National Nutrition Programme Area in Bangladesh: A Cross-Sectional Study. *J Hum Nutr Food Sci.* 2014, 2(2): 1028.
- [24] Community-Based Sub-Component of Ethiopian National Nutrition Program, addiss ababa Ethiopia; Addis Continental Institute of Public Health, 2009.
- [25] Dessalegn Tamiru, Dayan Aragu, Tefera Belachew. Survey on the introduction of complementary foods to infants within the first six months and associated factors in rural communities of Jimma Arjo. *International Journal of Nutrition and Food Sciences.* 2013; 2(2): 77-84
- [26] Bernadette P. Marriott, Alan White, Louise Hadden, Jayne C. Davies, John C. Wallingford. World Health Organization (WHO) infant and young child feeding indicators: associations with growth measures in 14 low-income countries. Blackwell Publishing Ltd *Maternal and Child Nutrition*, 2011.
- [27] Regassa N. Infant and child feeding practices among farming communities in Southern Ethiopia. *Kontakt* 2014; 16(4): e215–e222; <http://dx.doi.org/10.1016/j.kontakt.2014.09.002>
- [28] Debebe Moges, Yewelsew Abebe, Professor Rosalind S Gibson. Assessment of the Nutritional Adequacy of Complementary Foods and Infant and Young Child Feeding Practices in Sodo Zurea District, Wolayita, Southern Ethiopia. Estimated nutrient needs based on WHO/FAO 2004.
- [29] Mathewos Echamo. Exclusive Breast Feeding in Arbaminch, SNNPR, Ethiopia. *Harar Bulletin of Health Sciences.* 2012, 5.
- [30] Abay Sefene, Dereje Birhanu, Worku Awoke, Tesfaye Taye. Determinants of exclusive breastfeeding practice among mothers of children age less than 6 month in Bahir Dar city administration, Northwest Ethiopia; a community based cross-sectional survey. *Science Journal of Clinical Medicine.* 2013; 2(6): 153-159.
- [31] Tesfa Getanew Woldie, Addisu Workineh Kassa, Melkie Edris. Assessment of Exclusive Breast Feeding Practice and Associated Factors in Mecha District, North West Ethiopia. *Science Journal of Public Health.* 2014:2(4), 330-336.
- [32] Ergib Mekbib, Ashenafi Shumey, Semaw Ferede, Fisaha Haile. Magnitude and Factors Associated with Appropriate Complementary Feeding among Mothers Having Children 6-23 Months-of-Age in Northern Ethiopia; A Community-Based Cross-Sectional Study. *Journal of Food and Nutrition Sciences.* 2014, 2(2) 36-42.
- [33] Masresha Tessema, Tefera Belachew, Getahun Ersino. Feeding patterns and stunting during early childhood in rural communities of Sidama, South Ethiopia. *Pan African Medical Journal.* 2013; 14: 75.
- [34] Gudina Egata, Yemane Berhane, Alemayehu Worku. Predictors of non-exclusive breastfeeding at 6 months among rural mothers in east Ethiopia: a community-based analytical cross-sectional study. *International Breastfeeding Journal* 2013, 8(8).
- [35] Wondu Garoma Berra. Knowledge, Perception and Practice of Mothers/Caretakers and Family’s regarding Child Nutrition (less than 5 years of age) in Nekemte Town, Ethiopia. *Science, Technology and Arts Research Journal.* 2013, 2(4): 78- 86.
- [36] Gedew E, Demissie M, Misker D, Haftu D. Early Initiation of Complementary Feeding and Associated Factors among 6 Months to 2 Years Young Children, in Kamba Woreda, South West Ethiopia: A Community –Based Cross - Sectional Study. *J Nutr Food Sci.* 2014: 4(6).
- [37] Melkam Aemro, Molla Mesele, Zelalem Birhanu, Azeb Atenafu. Dietary Diversity and Meal Frequency Practices among Infant and Young Children Aged 6–23 Months in Ethiopia: A Secondary Analysis of Ethiopian Demographic and Health Survey 201. *Journal of Nutrition and Metabolism.* 2013, Article ID 782931, 8.
- [38] Kibebew Abera. Infant and Young Child Feeding Practices Among. Mothers Living in Harar, Ethiopia. *Harar Bulletin of Health Sciences.* 2012,4.
- [39] Baseline Survey Report Community-Based Sub-Component of Ethiopian National Nutrition Program. Addis Continental Institute of Public Health. 2009.
- [40] Samson Yemane, Tadesse Awoke, Measho Gebreslassie. Timely Initiation of Complementary Feeding Practice and Associated Factors among Mothers of Children Aged from 6 to 24 Months in Axum Town, North Ethiopia. *International Journal of Nutrition and Food Sciences.* 2014. 3(5):438-442.
- [41] Mussie Alemayehu, Kidan Abreha, Henock Yebyo, Kahssay Zemichael, Hailay Gebremichael. Factors Associated with Timely Initiation and Exclusive Breast Feeding among Mothers of Axum Town, Northern Ethiopia. *Science Journal of Public Health,* 2014: 2(5), 394-401.
- [42] Birara Melese Yalew. Prevalence of Malnutrition and Associated Factors among Children Age 6-59 Months at Lalibela Town Administration, North Wollo Zone, Anrs, Northern Ethiopia. *J Nutr Disorders Ther.* 2014, 4(1).

- [43] Elizabeth W Kimani-Murage, Nyovani J Madise, Jean-Christophe Fotso, Catherine Kyobu tungi, Martin K Mutua, Tabitha M Gitau, Nelly Yatich. Patterns and determinants of breastfeeding and complementary feeding practices in urban informal settlements, Nairobi Kenya. *BMC Public Health* 2011, 11:39.
- [44] Tesfaye Setegn, Tefera Belachew, Mulusew Gerbaba, Kebede Deribe, Amare Deribew, Sibhatu Biadgilign. Factors associated with exclusive breastfeeding practices among mothers in Goba district, south east Ethiopia: a cross-sectional study: *international breast feeding journal*. 2012, 7-17.
- [45] Tsedeke Wolde, Gadisa Diriba, Ababa Wakjira, Genet Misganu, Girma Negesse, Habtamu Debela, Tadesse Birhanu and Eyasu Ejeta. Knowledge, Attitude and Practice of Exclusive Breast Feeding Among Lactating Mothers in Bedelle Town, Southwestern Ethiopia: Descriptive Cross Sectional Study. 2014; 6(11):91-97.
- [46] Ethiopian Demographic Health Survey 2011.
- [47] Misgan Legesse Liben. Determinants of Early Initiation of Breastfeeding Among Mothers: The Case of Raya Kobo District, Northeast Ethiopia: *International Journal of Nutrition and Food Sciences* 2015; 4(3): 289-294
- [48] Tsedeke Wolde, Tadesse Birhanu, Eyasu Ejeta. Prevalence and Determinants of Timely Initiation of Breastfeeding among Lactating Mothers of Urban Dwellers in Western Ethiopia: A Community Based Cross Sectional Study. *Food Science and Quality Management*: 2014; 13: SSN 2224-6088 (Paper), ISSN 2225-0557.