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RESEARCH ARTICLE

COMPLEMENTARY FEEDING PRACTICE AND ASSOCIATED FACTORS AMONG MOTHER OF CHILDREN AGED 6—23 MONTHS IN AGRO-PASTORAL COMMUNITIES OF RURAL GODE DISTRICT, SOMALI NATIONAL REGIONAL STATE, EASTERN ETHIOPIA

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ABSTRACT

Background:- Poor feeding practices, coupled with high rates of infectious diseases, are the proximate causes of malnutrition during the first two years of life, there are approximately 10 million annual deaths of under-five year children, of which over one third of such mortality is caused by malnutrition related to inadequate complementary feeding. However, too early or too late introduction of complementary foods is not appropriate feeding practice as it carries many risks, which contributes to persistent child malnutrition, mortality and other complications. Nonetheless there is limited evidence with this regard low income countries including Ethiopia.

Objectives: The aim of this study was to determine prevalence of complementary feeding practice and associated factors among mothers of children aged 6-23 months in Agro-pastoral communities in Gode rural district.

Methods: A community based cross sectional study design was used with multi-stage random sampling method was used to select a sample of 634 mothers of eligible children. Data were collected using structured pretested questionnaire. Odds ratio along with 95% CI was estimated to identify factors associated complementary feeding practice among children aged 6 -- 23 months. The level of statistical significant was set at P-value less or equal to 0.05.

Results: Prevalence of complementary feeding practice was 15%, 95% CI(12.2,18.0). In multivariable logistic regression Analysis Maternal education [AOR=3.079, 95% CI(1.79,5.29)] and income [AOR=3.183, 95% CI (1.51,6.73)] were independently associated with complementary feeding practice.

Conclusion: Complementary feeding practice among agro-pastoral communities in Gode rural district was very low education were directly related to the ideal of complementary feeding practices so, effort should be put to increase female education, and also training on the issue related to farm product marketing to facilitate their income generation in order to increase socio-economical status. Furthermore community nutritional education on the issues related infant and young child feeding practices.

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INTRODUCTION

Adequate nutrition during infancy and early childhood is fundamental to the development of each child's full human potential. 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. Longitudinal studies have consistently shown that this is the peak age for growth faltering, deficiencies of certain micronutrients, and common childhood illnesses such as diarrhea. After a child reaches 2 years of age, it is very difficult to reverse stunting that has occurred earlier (Martorell et al. 1994). Complementary feeding is the process of starting semi solid or solid food when breast milk alone or infant formula alone is no longer sufficient to meet the nutritional

requirements of an infant and when other foods and liquids along with breast milk or a breast milk substitute are needed. The age range for complementary feeding is generally 6-23 months (Alive and Thr. 2014). Complementary feeding should be timely, meaning that all infants should start receiving foods in addition to breast milk from 6 months onwards. It should be adequate, in amounts, frequency, consistency and using a variety of foods to cover the nutritional needs of the growing child while maintaining breast feeding foods should be prepared and given in a safe manner, to minimize the risk of contamination with pathogens. And they should be given in a way that is appropriate, for the age of the child and applying responsive feeding following the principles of psycho-social care (WHO, 2014). As the babies grow continuously, they need additional nutrition along with continued breast feeding after they are 6 months of age. Even though babies may thrive on breast milk alone during the first 6 months of life, they become biologically fit to accept semisolids after 4 months of

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age (Elizebeth K. 2010). The indicators for the minimum frequency of feeding complementary foods are based on whether the child is being breastfed or not who recommends that infants start receiving complementary foods at 6 months of age in addition to breast milk, initially 2-3 times a day between 6-8 months, increasing to 3-4 times daily between 9-11 months and 12-24 months with additional nutritious snacks offered 1-2 times per day, as desired. (WHO, 2014). Inappropriate feeding practices are often a greater determinant of inadequate intakes than the availability of foods in the households, while the appropriate complementary feeding practice has been shown to prevent up to 6% of child deaths (WHO, UNICEF 2008). According to the lancet on the third series papers about maternal and child under-nutrition a review on studies focused on complementary feeding strategies, concluded that appropriately designed interventions can have a positive effect on feeding practices. access to safe water used for preparing and serving the food for the child and for drinking as well as good sanitation and hygiene are important for appropriate complementary feeding and has been shown to have an impact on reducing child mortality (Bhutta et al., 2008), Malnutrition is widespread in most developing countries and the condition is particularly serious in children below three years of age. In many areas where prolonged breastfeeding is common, nutritional problems generally arise after first year of life. Delayed supplementation and inadequate complementary feeding are the major factors responsible for this. In some populations a child is weaned so early that he is deprived breast milk and given supplements which are inadequate in nutrition. This leads to Marasmus at a relatively early age. Breastfeeding and proper complementary feeding practices are of at most importance in the prevention of malnutrition (Reddy, 1987). In Ethiopia inappropriate complementary feeding practices are a major contributor to poor nutrition status among children under two the Ethiopian demographic health survey (CSA, 2012) result shows that 29 % of children under age five are underweight (have low weight-for-age), and 9% are severely underweight.

The proportion of underweight children generally increases with each age cohort the proportion of underweight children is highest in the age groups 24-35 months (34 %) and lowest among those under six months (10 %). This may be explained by the fact that foods for weaning are typically introduced to children in the older age group, thus increasing their exposure to infections and susceptibility to illness. This tendency, coupled with inappropriate or inadequate feeding practices, may contribute to faltering nutritional status among children in these age groups. (CSA, 2012) In 2011 conducted survey in Ethiopia indicated among breastfed children age 6-23 months, 4% receive foods from at least four food groups, while 48% are fed the minimum number of times or more. In total, 4 % of breastfed children are given foods from four or more groups and also are fed at least the minimum number of times per day (CSA, 2012). Also the above result shows that only 4% of youngest children 6-23 months living with their Mothers are fed in accordance with IYCF practices. More than nine children of every ten (96 %) received breast milk or milk products during the 24-hour period before the survey. In Somali regional state the percentage of IYCF practice among all children 6-23 months is 2.2% (CSA, 2012). The introduction of complementary foods other than milk to young children in pastoralist societies is often late (At nine months or older) and of poor diversity, this has also been noted as a risk

factor for malnutrition in young children particularly because, on average, rates of wasting in pastoralist populations tends to be lower, in comparison to settled populations and national averages, below six months of age, but rises quickly after six months (Sellen 2002)

General objective

- To determine the prevalence of complementary feeding practice and identify associated factors among Mothers of children aged 6—23 months in agro-pastoralist communities of rural Gode district eastern Ethiopia in February 1, to march 2,2015

Specific objectives

- To determine the prevalence of complementary feeding practice.
- To identify factors associated with of complementary feeding practice

MATERIALS AND METHODS

Study area and period: The study was carried out in Gode district rural Kebeles in Somali regional state which is located at distance of 585 km away from Jijiga, the administrative city of the Somali regional state eastern Ethiopia. There are nine rural Kebele in the district. According to Gode administrative health office health facilities found in Gode town where one hospital (zonal Hospital), Two health Center and four private clinics the climate is hot most of the time between 18-36°C. The average elevation in the district is 358 meters above sea level. As of 2008, Gode has 125 kilometers of all-weather travel road and 630 kilometers of community roads, about 3.53% of the total population of the district has access to drinking water (personal communication with head health office of Gode district) The study was conducted between February 1, 2015 to March 2, 2015.

Study Design: A cross-sectional community based quantitative study design was used.

Source of population : All Mothers Having children aged 6-23 months and residing Gode district rural Kebeles.

Study population : All randomly selected Mothers of three randomly selected Kebeles

Inclusion criteria: Mothers of children aged 6-23 months who lived in the study area for a minimum period of six months were included

Exclusion criteria: Mothers who were sick or terminally ill at the time of the study were excluded Mothers of children aged 6-23 months who were unable to respond and communicate appropriately.

Sample size determination: The sample size was calculated using single population proportion formula considering the following assumptions: Degree of 95% confidence level, margin of error (0.05), expected prevalence of timely initiation on complementary feeding practice children aged 6-23 months in national level (p=51%) which is estimated from other study (CSA, 2012) was substituted in the following single population

proportion formula to get maximum sample size With a 95% CI (confidence interval) $z(1 - \alpha/2) = 1.96$ $P =$ estimated prevalence or proportion = 51% (CSA,2012) $D =$ accepted/standard error or precision = 0.05 design affect of 1.5 to maximize sample size lastly the required sample size and 10% of non-response yielding the required Final sample size of rate of 634 By comparing the two sample size calculated using single and double population formula which was 634 and 70 respectively. The larger sample size 634 was the total sample size for this study.

Sampling procedure; In this study multi stage sampling method was used by considering Gode rural Kebele which consist of nine Kebele three Kebele was selected from these nine Kebele by simple random sampling. List of households with children 6-23 in the selected Kebele was obtained by the Health bureau before period of data collection (634) households with eligible children 6-23 months was selected using systematic random sampling technique from households with children 6-23 months in this three Kebeles incase where there are more then one eligible individual in the selected household, a lottery method was used to pick one

Data collection tools: The study was carry out by using a structured interview schedule and questionnaires on complementary feeding practice. Standardized structured questionnaire was adopted from USAID, (DHS) demographic and health survey methodology 2008-2013. Some modification of the questionnaire was done in accordance with the local situation. Data was collected by health extension workers and supervised by health officer. The questionnaire was divided in to socio demographic and economic information of the parents, maternal and child health service characteristics, and complementary feeding practice. The questionnaire was pretested in 10% of the sample size in other district to ensure the validity and feasibility of questionnaire before administering it on the entire population. On the basis of pre-testing necessary modifications was done in original English version of the questionnaire was translated into Somali versions, then the local versions was translated back into English by professional personnel to check its consistence and data was collected by trained health professionals

Data collection procedure: The data collectors were gone to households that have been identified during sampling and try to contact the eligible persons (the parents of the children specially Mothers of child aged 6-23 month). The reason of visit was explained to the parent. The eligible persons was requested to participate in the study. Data was collected using structured pretested questionnaire by 10 health extension workers in profession and two supervisors which are health officer in profession, was supervised during data collection. Both the data collectors and supervisor were trained for three days, on objective and methods and materials of the research, data collection and interviewing approach,

Data quality control: The questionnaires was pre-tested a week before the actual data collection days for 10% of the sample size on same sampled unit of the study but in a kebele which is not selected for the study. And modification was done accordingly. Data collectors and supervisors was trained by principal investigator, during data collection trained supervisors was checked in the field how the data collectors are doing their task. At the end of each data collection day the

principal investigator was also checked the completeness of filled questionnaires encase a questionnaire was found to be missing some information, the respective data collectors was to go back to the respondents concerned to complete the questionnaire.

Dependent variable: Complementary feeding practice (Yes, No).

Independent variable: The Independent variable included Socio-demographic variables (Child and Mother): Age, Education, parity, family size, cultural, and income,

Data processing and analysis: The collected data were checked for completeness and consistency manually. Data were sorted, coded ad entered onto computer using Epi data software version 3.0 and cleaned by checking for error, implausible values and inconsistencies that might be due to coding or data entry errors. Data were exported to SPSS version 16 software packages for further analysis. Both descriptive and analytic approach were used to analyze the data. To ascertain the association; variables found to be significant ($p < 0.2$) in the bivariate analyses were used to construct a multivariate models. independent variables were tested for multicollinearity using correlation of Hosmer lemsnow and omnibus tests were used to test for model fit. Odds ratio along with 95% Confidence Interval (CI) was estimated to identify factors associated with complementary feeding practice using multivariate logistic regression analysis. Level of statistical significant was cleared at P.value less than or equal to 0.05.

Ethical considerations: He ethical clearance was obtained from Institutional Research Ethics Review Committee (IRERC) of the Haramaya University before the study launched. A formal letter of permission and supports was taken and submitted to concerned bodies. In this study participants were informed clearly and in detail manner about the importance of the study and written consent was obtained from them. The entire participants were informed that data will be kept private, confidential and used only for research purpose. The participants were also explained that they have the right to refuse or withdraw if they are not comfortable at any time.

RESULTS

Socio-demographic characteristics of study participants

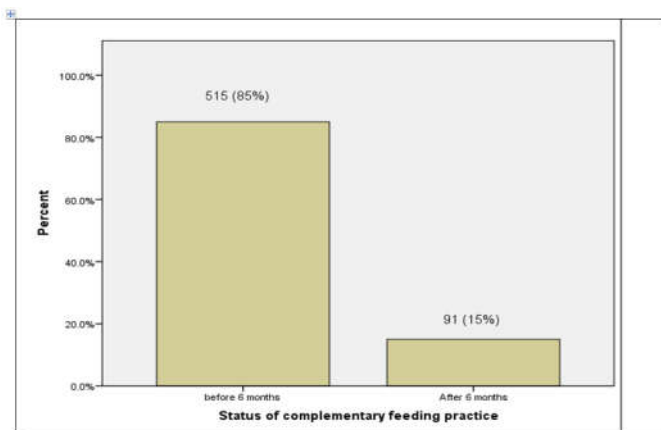
A total of 606 study participants were interviewed with 95.6% response rate. About 239(39.4%) of the mothers were within the age range 26 to 32 years. In terms of their income 164 (27.1%) have earning which is less than 700 birr. Furthermore most of the respondents, 354 (58.4%), were agro-pastoralists. Concerning to their number of births 293 (49%) have from 4 to 6 children (Table 1).

Status of complementary feeding practice

Of 606 of study participants only 15%95% CI (12.2, 18.0) were started complementary feeding at after six months, whereas majority of the study participants 85% were started complementary feeding before six months. (Figure: 3)

Table. 1 Socio Demographic related Variables of mother who had children aged 6-23 months of age (n=606) in Gode rural district

Variable	Level	Frequency	%
Mother' age	< 20 years	20	74.1
	20-24 years	74	80.4
	25-29 years	156	83.4
	30-34 years	139	90.8
	> 35	126	86.3
Income	Very low income	164	27.1
	Low income	154	25.4
	Middle income	137	22.6
	High income	151	24.9
Occupation	Housewife	80	13.2
	Go/NGO	2	0.3
	Student	1	0.2
	Agro pastoralist	354	58.4
	Daily laborer	18	3
	Farmer	151	24.9
Parity	1 child	23	85.7
	2-4 children	266	85.8
	> 5 children	226	85
Family size	1-2	12	85
	3-4	86	82.7
	>5	515	85.5
Income source	Job salary	7	1.2
	Own business	94	15.5
	Husband	455	75.1
	Remittance	28	4.6
	Family/relative support	22	3.6

**Figure 3. Status of complementary feeding practice of mothers children aged 6-23 months in Gode rural district, 2015.****Table 2. Complementary feeding information received among mother of children aged 6-23 months (n=606) in Gode rural district, 2015**

Variable	Level	Frequency	%
Received Complementary feeding information	Yes	350	57.8
	No	256	42.2
Source of information	Health facility	279	79.7
	TBA	33	9.4
	Family	30	8.6
	Friends	8	2.3
Started Complementary feeding	(<6) Inappropriate comp feeding	515	85
	(6-8) Appropriate comp feeding	91	15
Reason for starting before 6 months	Unsatisfactory growth	266	47.8
	Breast milk insufficient	197	35.4
	Poor quality breast milk	84	15.1
	Common usage	9	1.6

didn't find any information. Health facility was found to be a major source of information (279, 79.7%) and friend were the least source of information; only 8 (2.3%) respondent mothers said that they have found information from their friends. Regarding the time of the complementary feeding 515 (85%) started before six months, i.e. inappropriate complementary feeding where as about 91 (15%) started within Six to Eight months. The major reason for starting before six months as reported by 266 (47.8%) of the mothers was unsatisfactory growth and about 197 (35.4) of the mothers indicated that the major reason was insufficient breast milk (Table 2).

Complementary feeding practice of mothers

Complementary feeding practice revealed that from mother that were still breast feeding 75(52.1%) fed their child four times in the past 24 hours where as 227(51.4%) those who said no to breast feeding fed their child four times. additionally half (310, 51.2%) of the mother feed their children about four times during the past 24 hours and 205 (33.8%) of the mothers fed their children three times. Nearly half, 294 (48.6%) of the mother reported that they used glass to give fluid to their child followed by 153 (25.3%) saying they used bottle. Two indicators Minimum diet diversity and minimum meal frequency (for both breast fed and not breast fed) was computed based on WHO (2007) guideline Majority of the children 6-23 months old not met the minimum criteria for acceptable diet. Only Fourteen (2.31%)mothers offered four or more food groups to their child meeting the minimum dietary diversity criteria on the day preceding the study Grain 140,(23.1%) legumes15,(2.5) Dairy product 45,(7.5) fleshfood17,(2.8) Eggs35,(5.8) Vit A rich diets 16,(2.6) fruit and vegetables 26(4.3) by taking the number of children 6-23 months of age who received food from greater than four food groups during the previous days divided by the total number of children within that interval and by taking the number of breast fed children 6-23 months of age who received solid, semi solid or soft foods the minimum number of times or more during the previous day divided by the total number of breast fed children in 6-23 age interval respectively. Similarly it has also been calculated for non breastfed children. The result indicated that the minimum diet diversity is 2.3, the minimum meal frequency is 18.4 for breastfed children and 1.2 for non breastfed children aged 6-23 (Table 3).

The complementary feeding information and practice of the mothers were asked whether they have information on complementary feeding or no. Accordingly, about half, 350 (57.8%), replied 'Yes' whereas 256 (42.2%) indicated they

Factors associated with complementary feeding practice; In binary logistic regression analyses showed that mother's with primary education was started complementary feeding practice after six months 2.8 [COR= 2.798, 95% CI(1.65,

4.74)] as compared to those with secondary education. furthermore binary logistic regression analysis mother's age was significant associated with complementary feeding practice and revealed that mother's between the age of 25-29 were initiated 26% [COR= 0.809, 95% CI (0.45, 1.46)] complementary feeding at/after six months than mother's less than 25 years.

Table 3. Complementary feeding practice of the mother children aged 6 -- 23 months (n=606) in Gode rural district, 2015

Variable	Level	Frequency	%
Fed the child during the last 24 hours	Twice	37	6.1
	Three times	205	33.8
	Four times	310	51.2
	More than four times	54	8.9
Child was given fluid using	Bottle	153	25.3
	Spoon	93	15.4
	Glass	294	48.6
	By hands	59	9.8
Source of food in the family	Purchased	409	67.5
	Own production	117	19.3
	Food aid	66	10.9
	Shared production	5	0.8
	Others	9	1.5
Main staple food in the family	Rice	459	75.7
	Wheat	67	11.1
	Sorghum	76	12.5
	Animal product	2	0.3
	Others	2	0.3

complementary feeding practice among mothers of children aged 6-23 months in age. The way mother feed their children in the district today cannot be separated from their traditional belief and practice. This is exemplified by persistence of certain belief and practice with elder maintaining specific view and therapy impacting on infant feeding practice. This indicate it may not be able to change mother's belief and practice if this are regarded in isolation from such important actors in her community. Most nutritional education. however, is still targeted only at mothers, based on assumption that they are responsible for feeding the infant. The result of this study revealed that timely initiation of complementary feeding among mothers with children aged from 6-23 months was 15% with 95 CI (12.2,18.0). In multivariable logistic regression analysis Maternal education [AOR=3.079, 95% CI (1.79,5.29)] income [AOR=3.183, 95% CI (1.51,6.73)] were independently associated with complementary feeding practice. The study finding was low when compared to a study conducted in Bangladesh 23% (Farzana Saleh *et al.*, 2014) an India 87.3% (Vartika Saxena and Praveer Kumar, 2014). The percentage in this study was higher when compared to a study conducted Tigray 10.75%. (Ergib Mekbib *et al.*, 2014). This study finding shows that educational status were significantly associated with complementary feeding practice mothers who had primary education were of 3 times less likely to initiate complementary feeding at the appropriate time.

Table 4. Factors associated with Complementary feeding of a child among mothers of children aged 6-23 months in Gode Rural District, 2015

Variable Level		Complementary Feeding		Crude OR Adjusted OR	
		Appropriate feeding	Inappropriate feeding	95% CI	95% CI
Educational status	Secondary education	71(19.8)	288(80.2)	1	1
	Primary education	20(8.1)	227(91.9)	2.798(1.65, 4.74)**	3.35(1.93,5.82)*
Family income	Very low income	32(19.5)	132(80.5)	2.808(1.388,5.68)	3.071(1.43,6.61)*
	Low income	30(19.5)	124(80.5)	2.802(1.375,5.71)*	3.325(1.54,7.16)*
	Middle income	17(12.4)	120(87.6)	1.641(0.75,3.57)*	1.616(0.72,3.61)
	High income	12(7.9)	139(92.1)	1	1
Family size	1-2	2(14.3)	12(85.7)	0.979(0.22,4.47)	1.373(0.27,6.9)
	3-4	18(17.3)	86(82.7)	1.229(0.69,2.17)	1.397(0.67,2.93)
	5 or more	71(14.5)	417(85.5)	1	1
Parity	1	7(23.3)	23(76.7)	1.72(0.69,4.27)	1.068(0.30,3.76)
	2-4	44(14.2)	266(85.8)	0.935(0.59,1.49)	0.807(0.47,1.37)
	5 or more	40(15)	226(85)	1	1
Mother's age	< 20	8(28.6)	20(71.4)	0.608(0.23,1.6)	1.995(0.64,6.21)
	20-24	18(19.6)	74(80.4)	0.497(0.2,1.2)	1.124(0.52,2.43)
	25-29	31(16.6)	156(83.4)	0.252(0.09,0.68)*	0.997(0.51,1.93)
	30-34	14(9.2)	139(90.8)	0.397(0.15,1.02)	0.539(0.25,1.15)
	35 or more	20(13.7)	126(86.3)	1	1

In addition to this binary logistic regression revealed that income was significant with complementary feeding practice [COR= 1.641, 95% CI (0.75, 3.57)]. Whereas in multivariate logistic regression only maternal education [AOR=3.079, 95% CI (1.79, 5.29)] and income [AOR=3.183, 95% CI (1.51, 6.73)] were significantly associated with complementary feeding practice.

DISCUSSION

Initiating safe and nutritionally adequate complementary foods at six month is crucial to achieve optimal growth, development, and health of the child. Despite feeding related problems persists many developing countries. The present study provide the level and influencing factors on

[AOR 3.97,95% CI(1.79-5.29)] Compared to mothers with secondary education, The study finding is opposite with the study conducted in Tigray revealed that mothers who has educational status of secondary and above were almost 4 times [AOR= 3.84, 95% CI (1.33,11.09)] more likely to initiate appropriately complementary feeding practice (Ergib Mekbib *et al.*, 2014) and a study conducted in Bangladesh. Mothers who had primary and above education were more likely to started complementary feeding at recommended Age, [AOR of 37.2 95% CI (32.8, 41.9)] (Iqbal Kabir *et al.*, 2007) and other study conducted in Pakistan Mothers who started complementary feeding at appropriate time were all educated 47.1% (95%CI = 38.3, 56.1) (Tabish Hazir 2008). One possible explanation for this is mothers with primary education assume that being initiated complementary feeding practice at

early is important for their growth, furthermore mothers with primary education were belong to high socio-economical class which has accessibility to purchase modern feeding foods like (cerelac or buscuit). The study also revealed income of the mother was associated complementary feeding practice mother who belong very low income class were almost 3 times [AOR 2.8. 95% CI (1.388.5.68) more likely to start complementary feeding at the appropriate age then those mother who belong high income. The study finding is inverse to many studies conducted in different places such as a study conducted in India Mother's with high income status has 22.5 times [AOR 22.5.95% CI(17.23,28.41) more likely to start appropriately complementary feeding compared to those with low income (Rao Sl. et al 2011) and a study in Nepal Mothers with higher income were, 74.4 more likely to complementary feed at the appropriate time than those mother with low income [AOR 74.4 95% CI 62.1,78.2) (Pokhrel Raj Kumar *et al.*, 2009). One possible determination for this is some variables are not significant for this study such as; culture, parity and mother age which are significant for the other studies so, the main reason behind this it might be other variables may effect as confounding which may inhibit to become significant for this study.

Conclusion and Recommendation

Conclusion: Timely initiation of complementary feeding among mothers who have children aged 6-23 months in Gode district was relatively low mothers education, income, and family size was significantly associated with timely introduction of complementary feeding.

Recommendations

- Based on the finding of this study the following are recommended:
- Female education has a direct relation to the ideal infant feeding practices so Somali Regional Education Bureau should put effort to increase female education in order to improve the appropriate feeding practices. and also Health professionals who are involved in maternal health should provide nutrition education giving emphasis towards timely initiation of complementary feeding.
- Appropriate feeding practice is very low and effort should be made to increase the appropriate feeding practices strong attempt should be done by governmental and nongovernmental organization by putting more effort in consistency of food and timing of feeding to promote increasing the rate of complementary feeding practice
- information on discouraging before time of complementary feeding should be put on effort
- information on promoting of appropriate complementary feeding practice should not be mothers alone as the target for information and discussion relevant actor and decision-makers specially elders should be included
- further it has been advised to conduct the similar study and to correlate the interrelations among several variables in community more intensely.

Limitation: What the investigator perceives for this study are: first the use of cross sectional study which may not be strong

enough to identify relationship between the risk of outcome of interest. secondly due to cultural and religious perception of the study participant for initiation of complementary feeding practice in the area; because they believe that a soon after the delivery the babies cry is due to thirst then they start to give plain water and date. Shortage of literature or articles in order to compare and contrast specially in the discussion session.

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