

# Initiation time of weaning and associated factors among mothers of children aged less than 2 years in Aksum town, Tigray, Ethiopia: A cross sectional study, July 2018

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## Research article

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# Abstract

**Abstract Background:** Weaning is the period of time when infants introduce food different from breast milk in their diet, together with a gradual reduction of the intake of milk. It is estimated that 6% of under-five child mortality every year can be reduced through age appropriate infant feeding. Ethiopian demographic health survey 2016 declared that 21% of children consuming foods by age 4-5 months. Few Studies done in Ethiopia describe initiation time of weaning. **Objective:** To assess initiation time of weaning and associated factors among mothers of children aged less than 2 years in Aksum Town 2017/18. **Methods:** Community based cross-sectional study was conducted from December to May 2017/18 among 358 mothers of children. Simple random sampling technique was used to select from the five kebeles. Data was entered to Epi info version 7 and transported to SPSS version 22. Logistic regressions were used to identify the predictors of initiation time of weaning. Variables with P value <0.05 with 95% CI in the multivariable analysis were taken for declaring level of significance. The analyzed data were presented using texts, tables, graphs and charts. **Result:** In this study prevalence of early initiation of weaning was 38% (CI=33.0, 43.0). Mothers of children aged less than 2 years having poor knowledge on initiation of weaning Adjusted Odds Ratio ((AOR) =2.08, 95% CI=1.12, 3.90), mothers who were not received formal advice from health professionals on initiation of weaning (AOR =1.93, 95% CI=1.17, 3.16), mothers who return to work during post postpartum period (AOR= 3.32, CI=1.99, 5.54) and had family size of four and above (AOR= 2.53 ,95% CI=1.46, 4.39) were significantly associated factors with early initiation time of weaning. **Conclusion:** In this study prevalence of early initiation of weaning was high. Having poor knowledge, not received formal weaning advice, return to work and have family size of four and above were significantly associated factors with early initiation of weaning. Hence, Formal weaning advice should be given to mothers of children at health institutions during their prenatal care service regarding to initiation time of weaning. **Key words:** Initiation of weaning, early weaning, timely weaning

## Background

Weaning is the period of time when infants introduce food different from breast milk in their diet, together with a gradual reduction of the intake of milk to finally and gradually acquire their family's diet model (1). Similarly Weaning is the process of introducing and making the child accustomed or commencing with soft, semisolid, or solid foods gradually to replace breast/formula feeding (2, 3).

World health organization recommends that Infants should be exclusively breastfed for the first six months of life to achieve optimal growth, development and health. Thereafter, infants should receive nutritionally adequate and safe complementary foods while breastfeeding continues for up to two years of age or beyond (4).

Inappropriate time of weaning practice can lead to growth faltering, decreased immune protection, and increased diarrheal disease and malnutrition .The period during pregnancy and a child's first two years of life are considered a "critical window of opportunity" for prevention of growth faltering (6, 7, 8).

The prevalence of early weaning and the early introduction of weaning foods remain high in Uganda, Kenya and Ethiopia. Mothers returning back to their work place or confused infant feeding advice by clinical professionals and maternal sickness are often the registered reasons by the mothers for early weaning (5). Inappropriate initiation time of weaning and Inadequate complementary feeding lacking in quality and quantity can restrict growth and jeopardize child survival and development(9, 10,11).

About 60% of deaths yearly among children under five are directly or indirectly through malnutrition. Over two-thirds of these deaths are often related to inappropriate feeding practices, happen in the first year of life(12, 13,14). EDHS 2016 declared as only 60% of children are introduced to solid foods at 6-8 months, 11% of the infants begin foods before 6 months of age(11).

Study conducted in America declared that about 45% of study participants reported early weaning, with median breastfeeding duration of 2.7 months and In Ethiopia there are problems of malnutrition beginning early in life and it is imperative that any actions should be taken to address malnutrition in Ethiopia focus on infant feeding during the first year of life (15, 16,17).

Study done in Austria stated that the median breast-feeding duration was 6.93 months for both exclusive and partial breast feeding (18). But Studies done in Ireland and Germany also declared that the median age of introduction to solid foods was 4 months and before the age of 4 months in 29.4%(19, 20).Delayed commencement of weaning was influenced by education, occupation, income of the family, parity of mothers and large family size (21). Mothers who went outside home for job and had poor knowledge about weaning process introduced weaning foods at early age (22,23,24,25).

A study done in China showed that returning to work in post-partum and high levels of education were associated with earlier weaning(26). But a study done in Italy declared that mothers with lower education level was more likely to practice early weaning(18). Having Poor knowledge on the guidelines of weaning was the most reliable predictor of early weaning together with young maternal age(27, 28).

Prospective study done in Ireland showed that mothers who got informal advice from grandmother about infant diet were more likely to initiate weaning in the early time. But mothers who return to work in the postnatal period was not practice early weaning (19).

A comparative study conducted in Nigeria confirmed that 35.4% of the mothers with formal education practiced early weaning followed by 31.3% who practiced late weaning .On the other hand, more than half, 51.6% of the mothers with no formal education practiced normal weaning while 32.6% practiced late weaning (29). From those mothers who received formal advice, only a small number of them were started weaning food before six month of age compared to those mothers who had not received formal advice (30)

## Methods

### Study setting and period

A Community based cross-sectional study was conducted from December to May 2017/18 in Axum Town central zone of Tigray regional administration. Axum town is located in North part of Ethiopia. Axum Town is located at a distant of 1,024 km from Addis Ababa capital city of Ethiopia & 190 km from Mekelle capital city of Tigray and it is the administrative town of central zone of Tigray region. Axum town has total Population of 74,007 (according to the 2015 projection of CSA). Based on Tigray Regional Health Bureau estimate, in the town administration there are 3008 target mother-infant pairs. The town has one specialized and comprehensive hospital one general hospital 2 health centres and 6 private health institutions. The Town has 5 kebeles and children age less than 2years in the town.

#### Sample size determination and sampling procedure

The sample size was determined by using formula below, where P is drawn from study done in Amhara region, Ethiopia, March 2016 where proportion (p) was 61.5% (16). A sample size of 358 was determined using the single population proportion formula by using assumptions: n= required sample size  $Z_{\alpha/2}$  Standard normal score =1.96, P - Population proportion =61.5%, d – marginal error = 0.05 and none response rate 10%. All mothers of children aged less than 2 years in the kebeles were included.

Due to technical limitations, equation 1 has been placed in the supplementary files section.

Women who were unable to communicate and mothers of children aged less than 2 years whose child did not initiate weaning were not included in the study.

#### Study variables

Initiation time of weaning was the outcome variable measured by timely and early initiation of weaning. The independent variables were age of mother, parity, occupation, return to work during post partum period, marital status, educational level of the mother and the husband, sex of child, family professional advice, institutional delivery, having ANC service, having PNC service, advice from health workers/formal advice, immunization, mode of delivery , knowledge on initiation of weaning

#### Operational definition

Weaning:- Weaning is the period of time when infants introduce food different from milk in their diet (1).

Timely weaning: - Additional food given at 6 months age.

Early weaning: - Foods given in addition to breastfeeding before the age of 6 months(31).

Knowledge: Is the information in which an individual is aware on initiation of weaning. In this study it was measured based on the ability of the mothers to correctly identify and respond to knowledge

questions related to the initiation time of weaning. The level of knowledge was determined on a knowledge index. The highest possible score is 5 points. Weaning Knowledge was categorized as either poor (0-2 points), average (3 points) or high (4-5 points) (17, 23).

#### Data collection tools and procedures

Semi structured questionnaire was used as a tool of data collection which is adapted from different literatures and the component of the questionnaire (16, 18, 19, 26-28). The questionnaire was translated to the local language Tigrigna and back to English to have equal understanding among the data collectors and participants. Study participants were selected by simple random sampling method from 5 kebeles of Axum town using the sampling frame obtained from the town health extension workers. Households' number that are used by the health extension workers were used to identify the selected households.

#### Data management and analysis

After checking its completeness and appropriateness, it was coded and entered to Epi Info version 7.1.2.0 and analyse using SPSS version 22.0. Different statistical analyses including descriptive statistics, Bivariable and multivariable analysis was implemented to determine the relationship between the dependent and independent variables. The analysed data were presented using percents, texts, tables, graphs and charts. The result was described, interpreted and compared with similar studies.

#### Ethical Consideration

To conduct this research ethical clearance was obtain from Mekelle University College of health sciences Ethical Review Board (ERB). Formal letter of cooperation was written From TRHB to Axum Health office. Permission letter was received from the health office and from each kebeles. Verbal and written informed consent was also obtained from each study participants. Study participant were informed about the objective of the study. Participants were also informed about the confidentiality of the data that obtained from them by using codes instead of personal identifiers.

## Results

### Socio demographic characteristics

Totally 358 mothers of children age less than 2 years were involved in this study (response rate of 100%). The mean age of the participants were 27.4 with standard deviation of ( $\pm 5.32$ ) years. Majority 309(86.3%) of the respondents were Orthodox Christian in Religion. Three hundred twenty two (89.9%) of the mothers were married. Regarding to education 210 (58.7%) of the mothers in this study were secondary level and above. Two hundred fourteen (59.6%) of the study subjects were house wife. Majority of the mothers 302 (84.4%) had less than or equal to 3 family sizes. The mean age of the children were 14.5 ( $\pm 5.0$ ) months and more than half 244 (68.2%) of them were in the age group of 12-23 months. One hundred eighty four (51.4%) of children were male (**Table 1**).

## Maternal health service utilization

Three hundred fifty two (98.3%) of the participants had ANC service in their last pregnancy and one hundred ninety nine (55.6%) of them were counselled about weaning practice. All the study participants delivered their last pregnancy in health institutions where 262 (73.2%) of them delivered by vaginal delivery and 96 (26.8%) were delivered by caesarean section. Two hundred forty one (67.3%) of the participants had no postnatal care service while only 117 (32.7%) had post natal service for their last child. Two hundred sixty (72.6%) of the participants reported that their return to work during post partum period did not influence on initiation of weaning but 98 (27.4%) of the participants were initiate weaning food before six months to their child as a result of their return to work place during post partum period.

### Knowledge of participants on initiation time of weaning

Of the study participants about 148 (41.3%) of them had poor knowledge on initiation of weaning (**Figure 1**).

### Reasons of participants' on early initiation time of weaning

Most of participants had reasons to initiate early weaning for their child. About 86 (63.23%) of mothers reported that returning to work is their reason to initiate weaning earlier as stated in the pie chart below (**Figure 2**).

## Initiation time of weaning

During this study period all 358(100%) of study participants were started weaning for their child. Out of those study participants, only 38% (95% CI= 33.0, 43.0) initiate weaning before the age of six month and the rest 222(62%) were initiate weaning at the recommended age of six month (timely weaning) but none of the participants were initiate weaning after seven months (late weaning) of age. In relation to breastfeeding condition 64 (17.9%) of children ceased breast feeding during the study period and 25(39.06%) of them did it abruptly without commencing food to their child. The mean time of breast feeding cessation was 9.2 ( $\pm$  3.8) months of age. The rest 294 (82.1%) of the children were on breast feeding and their mothers were intended to stop at the mean age of 18.68 ( $\pm$  3.71) months of age. Of the study participants 62 (17.3%) and 97 (27.1%) were influenced to initiate weaning early for their infants by their husbands and other families respectively.

## Logistic and multivariate analysis of factors associated with early initiation time of weaning

After Bivariate analysis variables like family size, mean score knowledge of mothers on initiation time of weaning, maternal exposure to formal weaning advice , return to work during post partum period, having PNC service and being multiparous were with at P-value less than 0.2 and entered to multivariable analysis. In multivariable analysis, knowledge of mothers towards initiation time of weaning, maternal

exposure to formal weaning advice, postpartum maternal return to work and family size were significantly associated with early initiation time of weaning at P-value less than 0.05.

Mothers who had poor knowledge on initiation time of weaning were 2.08 times more likely to initiate weaning earlier compared to those who had good knowledge towards initiation time of weaning (AOR= 2.08, 95%CI: 1.12,3.90). Mothers who had not received formal weaning advice on initiation time of weaning were 1.93 times more likely to initiate weaning earlier for their children as compared to those who received formal weaning advice (AOR= 1.93, 95%CI: 1.17, 3.16). Mothers who returned to work during post partum period were 3.32 times more likely to initiate weaning earlier as compared to those who did not return to work during post partum period (AOR= 3.32, 95%CI: 1.99, 5.54). Mothers who had family size of four and above were 2.53 times more likely to initiate weaning earlier as compared to mothers who had family size of three and less than three. (AOR= 2.53, 95%CI: 1.46, 4.39) (**Table2**).

## Discussion

In this study 38% (95% CI= 33.0, 43.0) of mothers of children age less than 2 years had early initiation time of weaning. It is higher as compared with study done in Amhara region 15.7% of mothers practiced early initiation of weaning(16). This might be due to the professional variation. This is evidenced that 18.2 % of the participants were Government employed. But it is lower as compared with study done in Pakistan 46.8% (22). This could be probably due to the difference in sampling procedure were convenience in Pakistan.

It is also lower as compared with the study done in Ireland which is 71.3% (19). This might be due to difference in study design (prospective observational study) were in Ireland. And it is lower when compared with the study in Lahore 44% of mothers practice early initiation of weaning diet to their child (21). This could be due to the difference in educational status; about 38% of mothers in Lahore are illiterate while in our study 13% were illiterate.

But this finding is higher as compared with the study done in India 21.6% of mothers initiate weaning early for their infants(23). This could be due to the difference of educational back ground; about 11.9% of India's mothers were illiterate where as in our study about 13% of the mothers were illiterate. This could be also due to the difference of study setting (institution based) were in India. But it is lower as compared with the study done in America 45.2% mothers practice early initiation of weaning (17). This might be due to difference in study design and level of employment,( Longitudinal cohort study and high level of maternal employment) in America respectively.

In our study 41.3% (95% CI=36.3, 46.4) of mothers of children's had poor knowledge on initiation time of weaning. It is higher than study done in Egypt 30.2% (26). This might be due to the difference in study setting which was institution based in Egypt. But it is similar with study done in India 42% (23). This similarity could be due to the similarity of study population and study design.

In this study mothers who were not received formal weaning advice on initiation of weaning were two times more likely to initiate weaning earlier compared to those who received formal weaning advice. This is consistent with the study done in Amhara Region(16),Scotland(30) and UK (England) (28). This might be due to advice of health professional's did not reach to all mothers and mothers received some informal advice from family and friends on when to start weaning.

Mothers who return to work during post partum period were three times more likely to initiate weaning earlier compared to mothers who did not return to work during their post partum period. It is consistent with study done in china(26) and Jabalpur ( central India) (22). This might be due to mothers working outside the home are expected to initiation early weaning compared to those who work in their home.

Mothers who had family size of four and above were three times more likely to practice early initiation of weaning compared to those who had family size of three and less than three. This is consistent with the study done in Amhara region (16). This could be due to work load in mothers, when busy looking after a large family, tend to neglect the breast feeding needs of their young child this may lead them to start weaning food to the youngest child at the early time than mothers who have small family size.

Mothers who had poor knowledge on initiation of weaning were two times more likely to practice early initiation of weaning compared to those who had good knowledge towards initiation of weaning. This is in line with studies done in UK (28, 32).This might be due to mothers were given weaning information verbally during prenatal care service, relying on their social advice of weaning and their memory on initiation of weaning.

## **Conclusions**

The result of this study shows the prevalence of early initiation time of weaning is 38%. Significant number of mothers did not practice proper commencement of foods before the cessation of breast feeding and those on breast feeding mothers were planned to stop breast feeding for their children less than the recommended age which is less than two years. More than one third of the mothers of children aged less than 2 years had poor knowledge regarding to the recommended time of weaning and only few mothers had good knowledge on appropriate initiation time of weaning practice. Having poor knowledge on initiation time of weaning, returning to work during postpartum period, having four and above family and not receiving formal advice from health professional when to wean their children were factors associated with early initiation time of weaning.

## **Recommendation**

We recommend governmental organizations and other stakeholders in the study area that additional programs and interventions should be designed and implemented to decrease early weaning. Health education regarding to initiation time of weaning should be given by health extension workers at community level to avoid early weaning. Formal weaning advice should also provide to mothers of children at health institutions during their prenatal care regarding to initiation time of weaning.

# Abbreviations

ANC	Ante Natal Care
BSC	Bachelor of Sciences
CSA	Central Statistics Agency
EDHS-	Ethiopian Demographic Health Survey
EPI –info	Epidemiological Information
ERB	Ethical Review Board
HEWs	Health Extension Workers
IYCF	Infant and Young Child Feeding
MCH	Maternal and Child Health
NGO	Non Governmental Organization
PNC	Post Natal Care
PI	Principal Investigator
SPSS	Statistical Package for Social Science
TRHB	Tigray Regional Health Bureau
WHO	World Health Organization

## Declarations

### Consent to publish

Not applicable

**Competing interests:** The authors declare that they have no competing interests.

### Funding

Mekelle University funded this study.

### Authors' contributions

BWK and BHG were responsible for the conception of the study, participated in the study design, undertook the field study, conducted the data collection, analysis and interpretation, and wrote the manuscript. HGM and MK, were involved in the study design, supervised data collection and participated in data analysis. THW and EHA were involved in data analysis, interpretation and finalizing the manuscript. All the authors read and approved the final manuscript to be submitted for publication.

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## Availability of data and materials

All the required data supporting the findings are contained within the manuscript

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## Tables

**Table 1: Socio demographic characteristics of participants in Aksum town, Tigray, Ethiopia 2018**

Variables	Category	Initiation time of weaning	
		Early	Timely
<b>Mothers age group</b>	≤26	61(44.9%)	98(44.10%)
	26-35	64(47.01%)	108(48.6%)
	>35	11(8.08%)	16(7.20%)
<b>Parital status</b>	Primi	38(27%)	85(38.3%)
	Multi	98(72%)	137(61.7%)
<b>Marital status</b>	Married	118(86.8%)	204(91.9%)
	Divorced and Widowed	18(13.2%)	18(8.10%)
<b>Religion</b>	Orthodox	112(82.3%)	197(88.7%)
	Muslim	24(17.6%)	25(11.3%)
<b>Ethnicity</b>	Tigraweyti	136(100%)	222(100%)
<b>Educational status</b>	No formal education	13(10%)	36(16.2%)
	Primary level	32(23.5%)	67(30.1%)
	Secondary &above	91(66.9%)	119(53.6%)
<b>Occupation</b>	House wife	62(45.6%)	152(68.5%)
	Gov't employee	22(16.2%)	21(9.5%)
	Private work	52(38.2%)	49(22.1%)
<b>Husband education</b>	formal education	12(8.8%)	27 (12.2%)
	Primary level	26(19.1%)	47(21%)
	Secondary level and above	98(72.1%)	148(66.7%)
<b>Husbands occupation</b>	Government employed	46(33.8%)	85(38.3%)
	Private work	90(66.2%)	137(61.7%)
<b>Sex of child</b>	Male	63(46.3%)	110(49.5%)
	Female	73(53.7%)	112(50.5%)
<b>Age of child</b>	5-8	25(18.4%)	25(11.3%)
	9-11	18(13.2%)	46(20.7%)
	12-23	93(68.4%)	151(68%)

Table 2: Factors associated with early initiation time of weaning among mothers of children age less than 2 years (n=358) in Aksum town, Tigray, Ethiopia 2018

Characteristics	Initiation time of weaning		COR (95%)	AOR (95%)
	Early	Timely		
<b>Maternal education</b>				
No formal education	36	13	1	
Primary level	67	32	1.32 (0.61,2.83)	
Secondary & above	119	91	2.11 (1.06,4.22)	
<b>Family size</b>				
≥4	43	34	2.6 (1.51, 4.28)	2.53(1.46,4.39)
≤3	93	188	1	1
<b>Parity</b>				
Multi	98	137	1.6 (1.01, 2.54)	1.32(0.78,2.26)
Primi	38	85	1	1
<b>Knowledge of mothers</b>				
poor Knowledge	72	76	2.47(1.39, 4.41)	2.08(1.12,3.90)
Average knowledge	41	86	1.24(0.68, 2.28)	1.10(0.58,2.09)
Good knowledge	23	60	1	1
<b>Receiving formal weaning advice</b>				
No	70	71	2.24(1.44, 3.48)	1.93(1.17, 3.16)
Yes	66	150	1	1
<b>Return to work</b>				
Yes	56	46	2.68(1.86,4.84)	3.32(1.99,5.54)
No	80	176	1	1
<b>Post natal care service</b>				
No	101	140	1.69(1.06, 2.71)	1.55(0.92,2.63)
Yes	35	82	1	1

## Figures

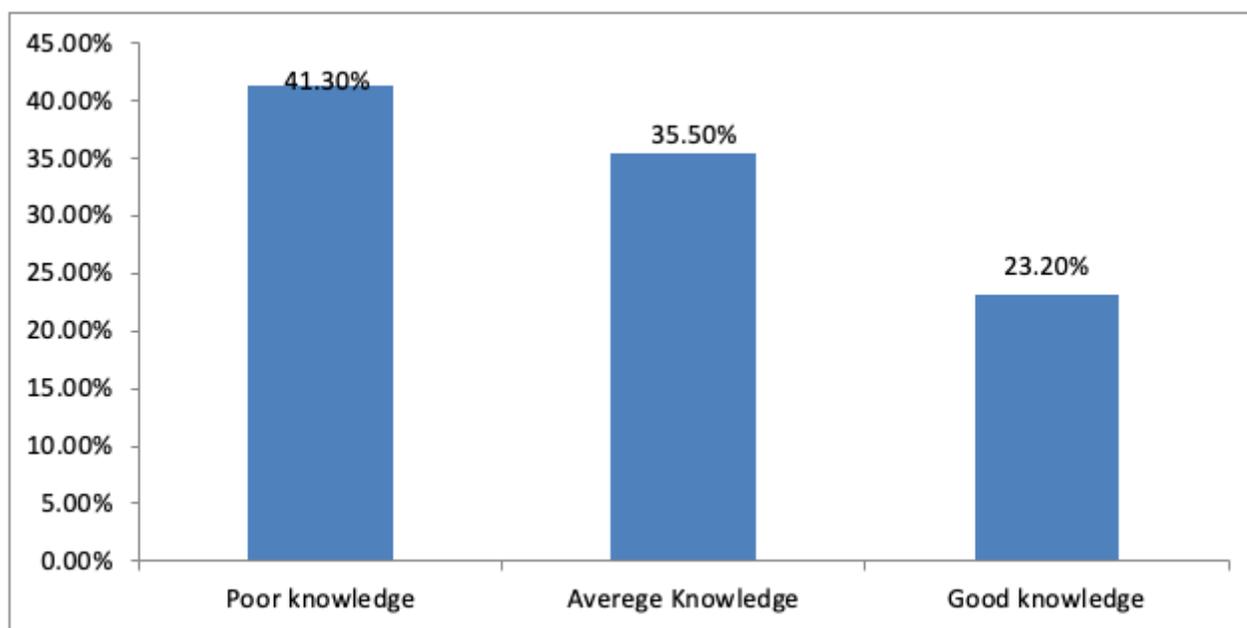
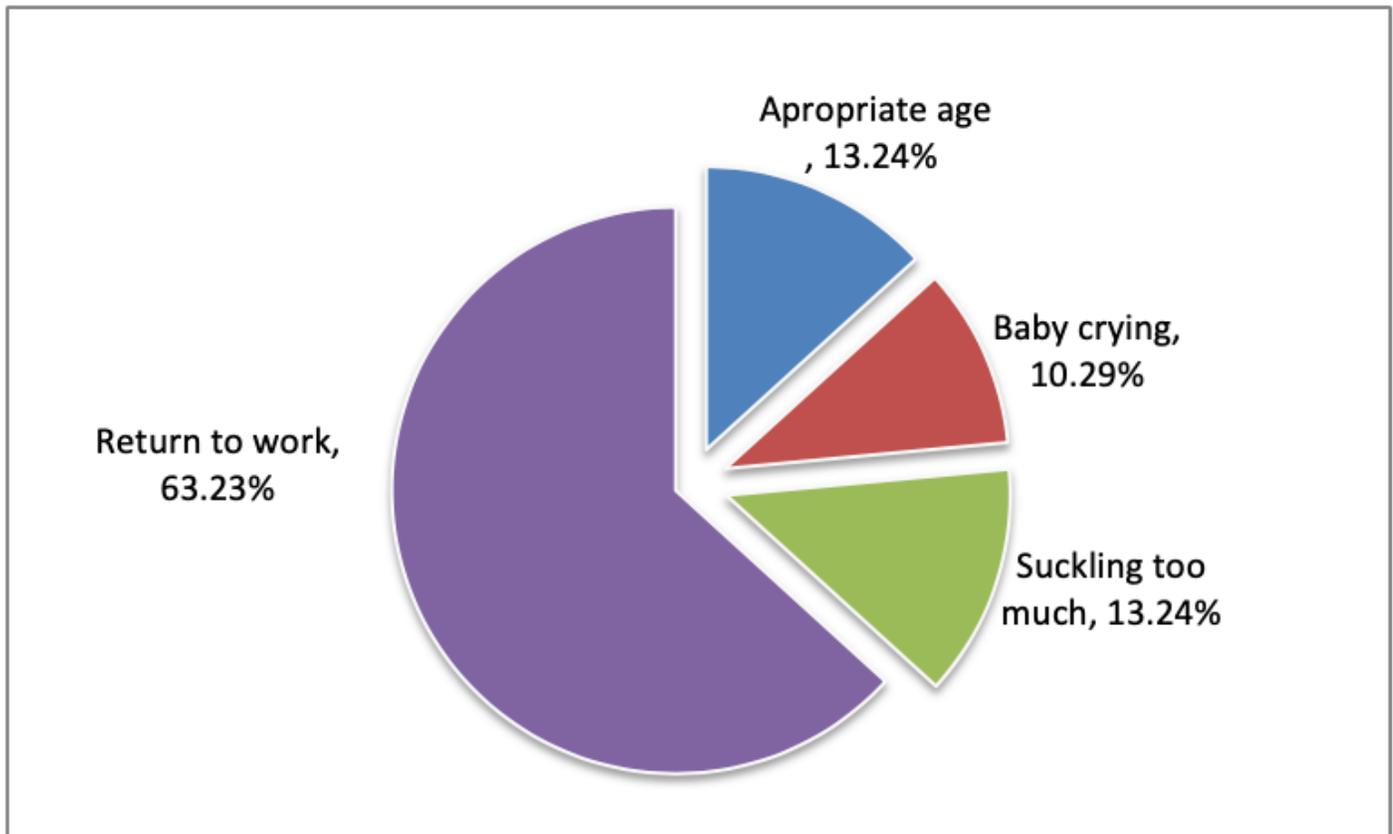


Figure 1

Category of participants' knowledge on initiation time of weaning among mothers of children aged less than 2year (n = 358) in Aksum town, Tigray, Ethiopia 2018



**Figure 2**

Reasons of participants' on early initiation time of weaning among mothers of children aged less than 2year (n= 358) in Aksum town, Tigray, Ethiopia 2018

## Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [Equation1.png](#)