The Association Between Employment Status and Timely Initiation of Infant Complementary Feeding Practice in Addis Zemen Town, Ethiopia, 2018.

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Abstract

Background

Complementary feeding is giving other foods or fluids to infants in addition to breast milk at six months of age. For better health and development of children, it should be timely (at six months of age). Thus, this study aimed to assess timely initiation of complementary feeding and associated factors among mothers with children aged 6–23 months in Addis Zemen Town.

Methods

A Community based cross-sectional study design was conducted from March 21 to April 10, 2018. Researchers recruited four hundred sixteen mothers whose child was aged from 6 to 23 months by systematic random sampling technique. We used interviewer-administrated questionnaire and then the data were coded and entered to EpiData version 4.2. It was exported to SPSS version 23 for analysis. Binary logistic regression model was fitted and variables p-values < 0.05 with multi-variable logistic regression analysis were considered as statistically significant at 95% confidence interval (CI). Adjusted odds ratio (AOR) was used to measure the strength of association.

Result

Timely initiation of complementary feeding was 57.7% with 95% CI (52.9, 62.3). In this study Being employed (AOR 2.34(1.07–5.16), visit antenatal care clinic four times and above (AOR 2.36(1.44, 3.85)), having good knowledge on complementary feeding (AOR 3.47(2.20, 5.48)), and having favorable attitude towards complementary feeding practice (AOR 3.87(2.46, 6.11) were found to be statically significantly associated with timely initiation of complementary feeding practice.

Conclusion

Timely initiation of complementary feeding practice was lower than WHO cut of point. Educate women, enhance antenatal visits and work to increase mothers’ knowledge are recommended. Additionally, special focus is better to be given for unemployed mothers.

Background

Complementary feeding is giving other foods or fluids to infants in addition to breast milk. Timely complementary feeding is giving to infants other foods or fluids in addition to breast milk at six months of age (1). Even though exclusive breastfeeding is crucial and adequate for the first six months of age, providing breast milk alone after six months does not satisfy the nutrition requirement of infants. Therefore, timely introduction of nutritionally adequate, safe, and age appropriate complementary feeding
at sixth month is important for the better health and development of children (2). Good complementary feeding practice enhances growth and prevents stunting in children. Infants are particularly vulnerable to malnutrition and infection during the transition period when complementary feeding begins (3). Although, there was an optimum breast-feeding, children are at risk of being stunted if adequate quantity and quality of complementary food is not given starting at six months of age (4). The effect of appropriate child feeding practice has vital role in developing countries where access to basic needs and health services are not adequately accessed (5). To develop estimates of the minimally adequate energy density of complementary foods, it is necessary to take feeding frequency into consideration (6). Appropriate complementary feeding means giving enriched and proper nutrient in every day and provides additional nutritious snacks between meals, for example mashed ripe fruit (7).

The World Health Organization (WHO) guideline for complementary feeding to those breastfed children describes other important aspects such as safe preparation, meal consistency and meal frequency. Foods with high energy density should require nutrient content in complementary food (8). Introduction of complementary foods too late results in an inadequate intake of energy and leading to stunting and poor growth, as well as iron and other nutrient deficiencies. Starting complementary food before six month is a common practice for infants with many reasons. Most mothers claim to introduce complementary foods early because they do not have enough amount of breast milk, or the baby keeps crying (9). Informal sources of weaning advice appeared to be most influential in younger mothers and those of lower educational attainment, and result in earlier weaning (10). As children grow, the consistency of complementary foods should change from semisolid to solid foods and diversified foods. By eight months, infants can eat ‘finger foods’ and by 12 months, most children can eat the same types of food as the rest of the family eat (11).

Malnutrition is one of the directly or indirectly, for over half of all childhood mortality in the world today. Infants and young children are at increased risk of malnutrition starting from six months of age, because breast milk alone is no longer sufficient to satisfy all nutritional requirements (11). Proportion of children 6 to 23 months of age who received foods of four or more groups of food from the seven recommended guidelines in the WHO were only 41.93% in South Asian country (8).

In Ethiopia, complementary feeding practices were alarmingly poor among children aged 6–23 months old (4). Even some mothers did not get appropriate information about the right time of complementary food (5).

From the physiological point of view, the taste function of children matures at around 6 months; an infant of this age can eat foods of different tastes and discover new foods that is differ from mothers’ milk. The capacity to absorb and digest starches and fats is sufficient in a child aged 4 to 6 months. The pancreatic amylase is active from the first month of age, and bile salts and the pancreatic lipase are active before the age of three months (6).

The worst effect of malnutrition occurred during pregnancy and early childhood time which is from conception to two years of age that means the first 1000 days. Undernourished children have weaker
immune systems and are thus more susceptible to infections and illnesses. Long-term insufficient nutrient intake and frequent infections can cause stunting; whose effects in terms of delayed motor and cognitive development are largely irreversible (12).

More than two out of every five children in Ethiopia are stunted. About 81% of all cases of children with under nutrition and related pathologies are untreatable. Nearly 44% of the health costs associated with under nutrition occur before the child reach one year old, and the annual costs associated with child under nutrition are estimated at Ethiopian birr (ETB) 55.5 billion, which is equivalent to 16.5% of GDP. Low school performance and other health problem are associated due to inappropriate complementary feeding in the country (13).

In Nepal, lack of getting information or knowledge regarding to appropriate complementary feeding practice found to be the most important factor associated. Others like education of mother, profession of father, maternal occupation was important association factors (14). The analysis showed that significant association between timely initiation of complementary feeding and maternity care, religion, exclusive breastfeeding, numbers of siblings and breastfeeding as independent predictors of timely initiation of complementary feeding (15). The result of study done on complementary feeding patterns in rural Western Chins revealed that maternal education, family income status, and the availability of food status were highly associated with complementary feeding practices (16). In unadjusted analyses done in US infants on timing of initiation of complementary foods revealed that, early introduction varied by breastfeeding status; race/Hispanic origin; Special supplemental nutrition program for women, infants, and children participation; and maternal age (17). Study done in Aligarh, Uttar Pradesh on feeding practices were found to be significantly associated with various socio-demographic factors such as sex of child, and literacy status of mother (18).

As the result of the research conducted in France on introducing new food texture complementary food depicted that ANC and PNC follow up were the most frequently listed source of oral information for complementary feeding practice. More than half of parents also looked for more information in books and on the internet and has association on complementary feedings practice (20). Research conducted in Ireland on complementary feeding revealed that maternal age and knowledge on appropriate complementary feeding has highly associated with the outcome of the result. This mean, mothers of infants who commenced complementary feeding prior to 17 weeks were younger. The first food was usually baby rice (69 %), infant breakfast cereals (14 %) or fruit/vegetables in this study area, which was (14 %) (21). Research done in Kenya 2013 revealed that 81(75%) of mother had appropriate knowledge for correct complementary feeding time (22).

Method

Study design and period:

A Community based cross-sectional study design was conducted from March 21 to April 10, 2018.
Study area

The study was conducted in Addis Zemen town, South Gondar Zone. According to the 2017/18 Addis Zemen town Administrator annual statistical report, the total population of the town is about 28,071 from these 1085 are children between 6 to 23 month of age in the town. Addis Zemen is the districts capital of Libokemkem which is found 645 Km, Northwest of Addis Ababa.

Population

The source population of this study was all mothers or caretaker having children aged 6 to 23 months in Addis Zemen Town while all mothers or caretakers having children 6- 23 months of age and who were living for more than six months in Addis Zemen Town were study populations.

Caretakers of children whose mothers died before their age of six month and mothers who were on exclusive formula feeding within six months of age of an infant was exclude from the study.

Sample size determination and sampling Technique

Sample size was determined by using single population proportion formula with assumptions of 56.5% proportion of timely (at six months) initiation of complementary feeding (14) 95% confidence level, 5% margin of error and 10% none respondent rate. The final sample size computed with these assumptions was 416. Sample size was also computed with covariates and the largest sample size (n=416) taken as final sample size.

Sampling frame of households of mothers or caretakers was obtained from the family folder in each health post, which accounts 1085 listed with serial number. Then to get the study subject computer generated simple random sampling method was used and a study subject who fulfilled the criteria in the selected household was interviewed.

Operational definition

Timely initiation of complementary feeding: giving additional food or fluid for infants at six month age of the infant.

Good knowledge on timely initiation of complementary feeding: Mothers answered 75% and above of knowledge assessment questions taken as having good knowledge on complementary feeding.

Favorable attitude towards timely initiation complementary feeding: Mothers answered 75% and above of the given attitude assessment questions taken as favorable attitude towards timely initiation of complementary feeding.

Data collection tool and procedure
Data was collected using semi-structured pretested interviewer administered questionnaire (see the supplementary file). The questionnaire was first prepared in English then translated to local language, Amharic and back to English to check consistency. Four diploma nurses and one health officer who were not working in the actual study area were recruited as data collectors and supervisors respectively and took training on how to obtain consent, how to interview and how to maintain confidentiality for one day. Pretest was done on 20 mothers having infant aged 6 to 23 months age in Wereta town (the nearby district town). The supervisor visited data collectors daily for any difficulty on the data collection processes.

**Data analysis technique**

The data checked, coded and entered to EpiData version 4.2 statistical software and analyzed using Statistical package for Social Science (SPSS) version 23. Binary logistic regression model was fitted and bivariate analysis was done to show the crude effect of each independent variable on the outcome variable. Variables with a P-value of <0.25 in the bivariate analysis were entered to a multivariable logistic regression analysis. The Adjusted Odds Ratio (AOR) with a 95 % Confidence Interval (CI) was used to assess the strength of association and variables with p-value of less than 0.05 were considered as statistically significant.

**Ethical consideration**

The ethical consideration was based on the national and institutional guidelines which is in line with the Declaration of Helsinki. Ethical clearance was obtained from ethical review committee of college of health Science, Debre Markos University prior to data collection and permission was obtained from Libokemkem Woreda health office. Verbal informed consent was taken from parents/care taker. Voluntary assent with written informed consent was obtained from mothers aged 18 years and less for their infants’ participation. Privacy and confidentiality of the information kept properly and names were not recorded.

**Results**

A total of 416 mother of child were included in the study with 100% response rate. The mean age of mothers with Standard Deviation (± SD) was 28.68(± 5.324) years. Most (80.5%) of them were married. 99.8% of the respondents were Amhara and 69.5% of them were orthodox tewahido Christianity followers. About 51% of children were females (Table 1).

All mothers had at least one ANC visit for the child and 23.1% of mothers had ANC visit for four times and above. Majority of mothers 385(92.5%) gave birth in health institutions. More than half (57.2%) of children born in hospitals and 23.1% gave birth by cesarean section. About 56% of the participants had access to media (television and radio). Nearly half (51%) of infants were females. More than seventy-five percent of participants attended postnatal care services (Table 2).
Child Feeding Practices

The prevalence of timely initiation of complementary feeding was 57.7 % with 95 % CI (52.90, 62.30%). One hundred twenty (28.8%) initiated complementary food before they reached at six month of age, while fifty-six children (13.5 %) started complementary feeding after sixth months of age. About three- fourth (75.7%) of the mothers had information about the appropriate time of complementary feeding. Three hundred eighty four (92.3%) of children had poor dietary diversity and 38.9% of children feed under low frequency (Table 3).

Factors associated with complementary feeding

From the bivariate analysis, maternal occupation, place of birth, marital status, antenatal visit, family access to mass media, number of postnatal visit, maternal knowledge and maternal attitude had p-value less than 0.25. All these variables entered to multivariable logistic regression analysis to control possible confounders. Only variables that had p-value < 0.05 were considered as significant and four predictor variables found to have p-value < 0.05. These are maternal occupation, number of ANC visit, maternal knowledge and attitudes towards child feeding practice.

The odds of timely initiation of complementary feeding among employed mothers was 2.3 times more than unemployed mothers (AOR: 2.34 (1.07, 5.16)). Mothers who visited ANC four times and above were 2.36 times more likely to practice timely initiation of complementary feeding (AOR; 2.36 (1.44, 3.85)) than those who visit less than four.

Mothers who had good knowledge (AOR; 3.47 (2.20, 5.48)) on timely initiation of complementary feeding were about 3.5 times more likely to practice it than their counterparts.

The odds of timely initiation of complementary feeding practice among participants who had favorable attitude was 3.9 times more likely than mothers who had unfavorable attitude (AOR; 3.874(2.458–6.106)) (Table 4).

Discussion

The result of this study revealed that the magnitude of appropriate complementary feeding was 57.7%, which was relatively lower as compared to the study conducted in Lalibela District (63%) and Arsi Negele (2, 23). In this research, postnatal care service utilization was low and thereby they may have less information on complementary feedings practice. This might lead to this magnitude difference.

On the other hand, timely initiation of complementary feeding practice in the current study was higher than studies conducted in Abyi-Adi town, Tigray, Northern Ethiopia (24), Nigeria (16) and United States (18). The possible reason for this might be due to study setting difference. In these mentioned countries, the culture of early weaning might be high. The child will be more likely to begin untimely.
This study finding is in line with studies conducted in Lasta District (25), Nepal (14) and Halaba Kulito Town (26).

The odd of timely initiation of complementary feeding among employed women was 2.3 times more than unemployed. It is in agreement with studies conducted in Northern Ethiopia (2, 27). This could be due to employed mother gave more attention to timing of complementary feeding and can afford for weaning meal costs.

Antenatal care was one of the factors to determine timely initiation of complementary feeding in this study, in which those who had four and above antenatal care service were more likely to practice timely initiation of complementary feeding than their counter parts and this finding was in line with study conducted in Lalibela District, Northeast Ethiopia (2). One of the services during antenatal care is counseling on self and infant feeding. Even, mothers are counseled to prepare food items from varity for their children. Therefore, the higher the antenatal care visit, the more mothers gain counseling services and in turn implement it then after.

This study also revealed that knowledge and attitude of mothers towards complementary feeding practice were determinant factors to initiate it timely, which means mothers who has good knowledge and favorable attitude were at higher odds of initiation of complementary feeding timely than those who has poor knowledge and un-favorable attitude respectively. This was in line with studies conducted in Wolaita Zone, Southern, Ethiopia (28) and kitui hospital, Kenya (22). The possible reason for this might be, while mothers attain good knowledge and favorable attitude towards complementary feeding, it enabled them to conduct timely and appropriate feeding to infants. Therefore, health education to postnatal mothers on complementary feeding practice my provoke timely weaning which ultimately reduce nutrition related infant mortality and morbidity.

**Conclusions And Recommendation**

This study depicted that the prevalence of timely initiation of complementary feeding was low as compared to WHO cut of point. Maternal employment status, antenatal care, maternal knowledge and attitude were found to be significant factors associated with timely initiation of complementary feeding practice. Scaling up of ANC and continuous education and counseling on timely initiation of complementary feeding practice to increase knowledge and attitude of mothers are recommended. Additionally, we recommend health care providers to give special attention to unemployed mothers on complementary feeding counseling.

**Declarations**

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Consent to publication: Not applicable

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Tables

Table-1: Socio-demographic characteristics of mothers in Addis Zemen Town, South Gondar, Ethiopia, 2018.
| Variable                                  | Frequency | Percentage |
|-------------------------------------------|-----------|------------|
| Age of mother in years ($n=416$)          |           |            |
| 15-24                                     | 86        | 20.6%      |
| 25-34                                     | 264       | 63.5%      |
| >35                                       | 66        | 15.9%      |
| Maternal Education ($n=416$)              |           |            |
| unable to read & write                    | 89        | 21.3%      |
| able to read & write                      | 81        | 19.5%      |
| primary school (1-8)                      | 103       | 24.8%      |
| secondary school (9-12)                   | 89        | 21.4%      |
| certificate & above                       | 54        | 13%        |
| Maternal occupation ($n=416$)             |           |            |
| Merchant                                  | 103       | 24.8%      |
| Daily labor                               | 20        | 4.7%       |
| House wife                                | 231       | 55.5%      |
| Student                                   | 19        | 4.6%       |
| Government employee                       | 37        | 8.9%       |
| Others*                                   | 6         | 1.5%       |
| Household family size ($n=416$)           |           |            |
| 2-3                                       | 168       | 40.4%      |
| 4-6                                       | 239       | 57.5%      |
| >6                                        | 9         | 2.1%       |

*farmer, waiter

Table-2: Maternal health care service condition and reproductive related factors in Addis Zemen Town, South Gondar, 2018
| Variable                          | Frequency | Percentage |
|----------------------------------|-----------|------------|
| children age \((n=416)\)         |           |            |
| 6-8months                        | 85        | 20.4%      |
| 9-11 months                      | 145       | 34.9%      |
| 12-23 months                     | 186       | 44.7%      |
| Place of delivery \((n=416)\)    |           |            |
| Home                             | 29        | 7%         |
| Hospital                         | 238       | 57.2%      |
| Health center                    | 146       | 35.1%      |
| health post                      | 2         | 0.5%       |
| private clinic                   | 1         | 0.2%       |
| Mode of delivery \((n=416)\)     |           |            |
| SVD                              | 306       | 73.6%      |
| Cesarean section                 | 96        | 23.1%      |
| assistant instrument             | 14        | 3.3%       |

Table-3: Child feeding practice among mothers or caregivers who had children aged 6 to 23 months in Addis Zemen Town, South Gondar, 2018.
| Variable                                | Frequency (n=416) | Percentage |
|----------------------------------------|-------------------|------------|
| **Feeding practice**                   |                   |            |
| <6 month                               | 120               | 28.8%      |
| at 6 month                             | 240               | 57.7%      |
| >7 month                               | 56                | 13.5%      |
| **Diet restriction during illness**    |                   |            |
| Yes                                    | 304               | 73.1%      |
| No                                     | 112               | 26.9%      |
| **Hand washing**                       |                   |            |
| Yes                                    | 235               | 56.5%      |
| No                                     | 181               | 43.5%      |
| **Dietary diversity**                  |                   |            |
| ≥4(good)                               | 32                | 7.7%       |
| <4(poor)                               | 384               | 92.3%      |
| **Frequency of child feeding**         |                   |            |
| ≥4 times                               | 254               | 61.1%      |
| <4 times                               | 162               | 38.9%      |

Table 4: multivariable logistic regression analysis of factors associated with complementary feeding in Addis Zemen Town, South Gondar, 2018.
| Variables                  | Timely initiation | COR          | AOR          | p-value |
|----------------------------|-------------------|--------------|--------------|---------|
|                            | Yes | No |                  | Yes | No |                  | Yes | No |                  |        |      |
| Maternal occupation       | Employed  | 30 | 15 | 1.53(0.80,2.96) | 2.34(1.07,5.16)* | 0.034 |
|                           | Unemployed  | 210 | 161 | 1 | 1 |                  |     |     |                  |        |      |
| Place of birth             | H. Institutions | 224 | 158 | 1.60(0.80,3.22) | 1.55(0.70,3.40) | 0.281 |
|                           | Home  | 16 | 18 | 1 | 1 |                  |     |     |                  |        |      |
| Marital Status            | Married  | 181 | 121 | 1.39(0.90,2.15) | 1.48(0.89,2.44) | 0.129 |
|                           | Unmarried  | 59 | 55 | 1 | 1 |                  |     |     |                  |        |      |
| ANC visit                  | ≥4 | 180 | 106 | 1.981(1.302-3.016) | 2.36(1.44,3.85)* | 0.001 |
|                           | <4 | 60 | 70 | 1 | 1 |                  |     |     |                  |        |      |
| Family with mass media     | Yes  | 150 | 85 | 1.78(1.20,2.65) | 1.54(0.98,2.43) | 0.062 |
|                           | No   | 90 | 91 | 1 | 1 |                  |     |     |                  |        |      |
| PNC                        | Yes  | 193 | 122 | 1.15(1.16,2.87) | 0.62(0.37,1.04) | 0.068 |
|                           | No   | 47 | 54 | 1 | 1 |                  |     |     |                  |        |      |
| Maternal Knowledge         | Good | 166 | 61 | 4.23(2.80,6.40) | 3.47(2.20,5.48)* | 0.001 |
|                           | Poor | 74 | 115 | 1 | 1 |                  |     |     |                  |        |      |
| Maternal Attitude          | Favorable | 173 | 62 | 4.75(3.12,7.21) | 3.87(2.46-6.11)* | 0.001 |
|                           | Unfavorable | 67 | 114 | 1 | 1 |                  |     |     |                  |        |      |

*P<0.05