**Original Research Article**

# Exclusive Breastfeeding Practice with Associated Factors among mothers in Iringa and Njombe regions in Tanzania


## Abstract

**Introduction:** Globally, the promotion of exclusive breastfeeding practice is recognized as an effective nutrition intervention to prevent childhood morbidity and mortality. Regardless of the well-documented advantages of exclusive breastfeeding, millions of infants are missing this potentially life-saving initiative. Limited research data exists on factors influencing mothers to practice exclusive breastfeeding.

**Aims:** This study aimed to assess the prevalence of exclusive breastfeeding with associated factors among mothers with children aged below 6 months in the Iringa and Njombe regions

**Study design:** This was a cross-section study conducted among mothers with children aged below 6 months.

**Methodology:** The standard questionnaire was used to collect information regarding exclusive breastfeeding practice among selected mothers. The descriptive statistics were done for the social and demographic characteristics of the study participants. Bivariate and multivariate logistic regressions were performed to predict the association of independent variables on the study outcome. The non-parametric statistical test was used and statistical significance was defined as a p-value of less than 0.02 in bivariate and less than 0.05 in multivariate analysis.

**Results:** This study found 79% of mothers have exclusively breastfed their infants one day before the survey. The multivariate analysis found a significant association of exclusive breastfeeding practice with female children (AOR = 4.969, 95% CI = 1.691–14.608, p <0.05) and mother's education (AOR = 0.091, 95% CI = 0.1 – 0.815, p <0.05).

**Conclusion:** Exclusive breastfeeding is crucial to ensure the proper growth and development of infants to their fullest potential. Therefore, multiple efforts are encouraged to ensure mothers adhere to exclusive breastfeeding and all infants are guaranteed to benefit from it.



**Keywords:** Exclusive Breastfeeding, Nutrition, Infants growth, children aged below 6 months, Tanzania.

## Introduction

Exclusive breastfeeding (EBF) is the feeding of a child with breast milk only, without giving the child any other food or liquid, except drops or syrup of medicines prescribed by medical personnel[1]. EBF for infants from 0 up to six months is strongly recommended by the world health organization (WHO) and United Nations International Children's Emergency Fund (UNICEF) [2]. Globally, the promotion of EBF practice is recognized as an effective nutrition intervention to prevent childhood morbidity and mortality[3]. EBF improves infant growth and cognitive development [4,[2] EBF has the potential to prevent 13.8 percent of all deaths in children under the age of two years and 11.6% of deaths in children under the age of five years[3]. Exclusively breastfed children have been shown to have a lower risk of gastrointestinal infections and acute respiratory infections compared to children who were not exclusively breastfed [6],[7]. Despite the well-documented advantages of EBF, millions of infants are missing this potentially life-saving initiative [8].

Globally, only 39% of infants under the age of 6 months were exclusively breastfed, and many countries still experience a lower prevalence of EBF than the recommended international standards by WHO (90%) [9]. In Tanzania, the Demographic and Health Survey (TDHS, 2015-2016) reported only 59% of mothers practiced EBF, and 51% initiated breastfeeding (IBF) within one hour after delivery [10]. Many studies have examined several factors associated with insufficient EBF. In a study conducted in China [11], education level and early breastfeeding initiation were found to be positive factors associated with EBF Also, other studies showed good knowledge, mode of delivery, family monthly income, age of a mother, postal natal visits; residence, birth weight, and delivery season were significantly associated with EBF practices [12],[13],[14][15].

Tanzania's government, in collaboration with development partners, has been using different strategies to promote EBF. Among the many strategies commonly advocated are the Baby-Friendly Hospital Initiative (BFHI), the Infant and Young Child Feeding (IYCF) Initiative, World Breastfeeding Week (WBW) Commemorations, and providing training to healthy facility service providers (HSP) and community health workers (CHWs) who provide education, counseling, and support on EBF to pregnant and lactating mothers [16][17],17[18]. Iringa and Njombe are privileged to be among the regions supported by UNICEF, USAID, and other development partners on different programs promoting IYCF, including EBF promotion [19]. Despite all the efforts deployed to promote EBF in the area, the practice has not reached the WHO recommendation. According to the Tanzania National Nutrition Survey, the prevalence of EBF for Iringa and Njombe is 66.2% and 70%, respectively. To promote EBF, the prevalence and the associated factors must be identified and understood to develop appropriate policies to improve the situation of EBF However, limited research data exists on factors influencing mothers to practice EBF in these two regions. Therefore, to fill this knowledge gap this study aimed to assess the prevalence of EBF with associated factors among mothers with children aged below 6 months in the Iringa and Njombe regions.

## Materials and methods

**Study setting and design**

This was a cross-sectional study design conducted in two regions; Njombe and Iringa. The selection of regions was based on the high prevalence of stunting, with 42% and 49% for Iringa and Njombe, respectively, according to data from the Tanzania Demographic and Health Survey [10]. The number of stunted children in the Iringa and Njombe regions is 161,369 and 118,350 under-five age children, respectively [20]. Two districts were randomly selected in each region; Iringa and Kilolo districts in the Iringa region, Njombe, and Wanging'ombe districts in the Njombe region.

**Study population and sampling procedures.**

The study population consisted of mothers with children aged below 6 months during data collection since 0 to 6 months is the period recommended by WHO to practice EBF. All mothers who attended the postnatal clinic during the day of data collection and gave consent to participate in the study were eligible to be included. Exclusion criteria were mothers with children age 6 months and above, those with mental illness, and those who attended postnatal clinics but were not willing to sign consent forms. This study used a two-stage sample design, with the first stage consisting of a random selection of district council members based on probability proportionate to size. The study's second stage involved the selection of a health facility and participants based on systematic random sampling, with mother with children aged 0 to 6 months who met all inclusion criteria being included. At each healthcare center, participants were briefly introduced to the purpose, benefit, risk, confidentiality of the information, and voluntary nature of participation in the study. Those who were willing to participate were provided with a consent form to sign before participation. Participants were also informed of the right to withdraw from the study at any time.

A total of 128 mothers with children aged below 6 months from health care centers located in the four districts in the Iringa and Njombe regions were recruited to participate in this study.

The sample size for this study used a power calculation to determine the required number of participants. The calculation is based on Human Health Series No. 7 (IAEA, 2010). The sample size n, in each group, was determined as per the equation below:

$$n = f(\alpha, \beta).2\frac{\sigma^2}{\delta^2}$$

Where:

$\sigma$ = Standard deviation, for this study, was taken as 130g/d for human milk intake;

$\delta$ = the difference in means for human milk intake between intervention and control groups. This study assumed for 100g;

$\alpha$ = is significance level, here considered as 0.05;

, Power = the study used a power of 80%;

= multiplication factor, for =0.05 and = 80%; the factor was 7.85;

Therefore, the sample size for this study was calculated as follows:

$$n = f(\alpha,\beta).2\frac{\sigma^2}{\delta^2}$$

Where:

σ = Standard deviation, for this study, was taken as 130g/d for human milk intake;

δ = the difference in means for human milk intake between intervention and control groups. This study assumes for 100g;

α = is significance level, here considered as 0.05;

β , Power = the study used a power of 80%;

$f(\alpha,\beta)$ = multiplication factor, for $\alpha$ =0.05 and $\beta$ = 80%; the factor was be 7.85;

Therefore, the sample size for this study was calculated as follows:

$$n = 7.85 \times 2 \times \frac{130^2}{100^2} = 27$$

Therefore, the sample size of 128 was obtained by multiplying 27 by 4 plus 18.5 percent to account for the missing value.

**Data collection; Period, tools, and procedures**

Data collection was done in the period between November 2019 and February 2020. Well-structured questionnaires with both closed and open-ended questions were used for data collection. The questionnaire had two sections. The first section contained questions concerning social demographic characteristics such as age, education level, marital status, and occupation. The second section of the questionnaire consists of questions regarding information about EBF, including knowledge, practices, and attitudes. Both the questionnaires and the informed consent forms were drafted in English and then translated into the Kiswahili language for easy understanding by study participants. Six nutrition officers, four nurses working at reproductive child healthy sections, and one researcher (MSc.) working at the Tanzania Food and Nutrition Center (TFNC) were involved in data collection. The whole process was supervised by one principal researcher (Ph.D.) from TFNC. One-day orientations and training on how to interview and record the data were given to all data collectors and supervisors before the start of the study. The one-day pilot study was done to pre-test and validate the tool.

**Study variables**

EBF practice was considered as the dependent variable and it was coded as "1" while non-EBF was coded as "0" in the regression analysis. Mothers' demographic characteristics (age, marital

status, education, and occupation status) and knowledge of EBF were regarded as independent variables. The child's age was categorized into two groups; 2–3 and 4–5 months, while the age of the mother was categorized into three groups; 15–24, 25–34, and 35–45 years. Marital status was categorized into two groups: single and married; education level was categorized into three groups: no education, primary education, and secondary and higher education; and occupation status was categorized into two groups: unemployed and employed.

**Data analysis**

The data analysis was done using the statistical social package (SPSS) version 25. All filled questionnaires were checked for completeness before entering the data into SPSS. The dataset was cleaned, coded, and transformed into the recommended format before analysis. Descriptive statistics were done to find frequencies for demographic characteristics, prevalence, and practice of EBF. The chi-square was also done to find an association between EBF and the mother's characteristics. Both bivariate and multivariable logistic regression models were done to predict factors associated with exclusive breastfeeding. In bivariate logistic regression, all variables significantly associated with EBF at less than or equal to top-value 0.2 were fitted into the multivariable logistic regression model to control for confounding variables. Odds ratios and their 95% CIs were computed, and variables with a p-value less than 0.05 were considered statistically significant. A prior analysis of the multicollinearity of independent variables was conducted to test if they correlate with each other.

**Ethical clearance**

Ethical clearance was sought from National Institute for Medical Research (NIMR) with reference number NIMR/HR/R.8a/Vol.IX/3120, all participants were required to read and sign informed consent papers attached to all questionnaires if they wished to participate in the study.

**Results**

**Demographic characteristics of participants**

The study included 128 mothers who met the inclusion criteria. Only 14.8 percent of the mothers were 35 to 45 years old. The majority (77.3%) were married, 65.9% had only primary education, and 99 percent were employed. (Table 1).

Table 1: Demographic characteristics of study participants.

| Variables | Number | Percentage |
|---|---|---|
| Children | | |
| Sex | | |
| Female | 78 | 60.9 |
| Male | 50 | 39.1 |
| Age group (month) | | |
| 2 – 3 | 55 | 42.6 |

| | | |
|---|---|---|
| 4 – 5 | 73 | 57.4 |
| Mothers | | |
| Age group (years) | | |
| 15 – 24 | 55 | 43 |
| 25 – 34 | 54 | 42.2 |
| 35 – 45 | 19 | 14.8 |
| Marital status | | |
| Single | 29 | 22.7 |
| Married | 99 | 77.3 |
| Education level | | |
| No education | 8 | 6.3 |
| Primary education | 84 | 65.6 |
| Secondary &higher education | 36 | 28.1 |
| Occupation | | |
| Unemployed | 29 | 22.7 |
| Employed | 99 | 77.3 |

**Exclusive breastfeeding practice**

In this study, the majority of mothers (79.5%) exclusively breastfed their infants one day before the survey, 67.5 percent started breastfeeding their newborns within one hour of birth, and 93.7 percent fed colostrum to their infants (Table 2).

Table 2: Exclusive Breastfeeding practices (N=128)

| **Variable** | **Frequency** | **Percentage** |
|---|---|---|
| Practice Exclusive Breastfeeding | | |
| Yes | 101 | 79.5 |
| No | 26 | 20.5 |
| Initiation of breastfeeding | | |
| Within 1 hour | 85 | 67.5 |
| More than 1 hour | 41 | 32.5 |
| Still, breastfeeding? | | |
| Yes | 126 | 100 |
| No | 0 | 0 |
| Colostrum feeding | | |
| Yes | 118 | 93.7 |
| No | 8 | 6.3 |

**Knowledge of mothers regarding exclusive breastfeeding**

The majority of mothers (67.2%) received information about EBF from community health workers, and about 124 mothers (99.9%) recognized that the infant should be on EBF for six

months. One hundred and sixteen (90.4%) mothers said they had never received any media messages promoting breastfeeding. (Table 3).

Table 3: Knowledge of mothers regarding EBF (N = 128)

| Variable | Frequency | Percentage |
|---|---|---|
| Mothers who received breastfeeding information from CHWs during pregnancy and or after birth | | |
| Yes | 86 | 67.2 |
| No | 42 | 32.8 |
| Mothers who understood the correct age a baby to receive only breast milk (6 months of EBF) | | |
| Yes | 124 | 99.9 |
| No | 4 | 3.1 |
| Have you ever seen/hear about breastfeeding in an advertisement on television, radio, or in a magazine (any media) | | |
| Yes | 12 | 9.6 |
| No | 116 | 90.4 |

**Factors associated with EBF practice**

In bivariate analysis, the following variables were found to be significantly associated with EBF at p=0.2: child's sex and age, mother's education status, having talked to CHWs during pregnancy or after birth, knowing the correct age of EBF, and seeing an advertisement about EBF on television, radio, and magazines. To account for confounding variables, all of these values were entered into a multivariable logistic regression model. When comparing mothers with female children to their counterparts, multivariate analysis revealed that the odds of EBF practices were higher for mothers with female children (AOR = 3.99, 95% CI = 1.42–11.16, p<0.05). In addition, mothers with no education have a lower likelihood of EBF practice (AOR = 0.1, 95% CI = 0.01 – 0.64, p <0.05) compared to their counterparts (Table 4).

**Table 4: Bivariate and multivariate logistic regression results on factors associated with EBF practice among mothers with children aged below 6 months.**

| Variables | EBF Yes | Frequency (%) | Crude OR (95 CI) | p-value | Adjusted (95% CI) | OR | p-value |
|---|---|---|---|---|---|---|---|
| Child's age | | | | | | | |
| 2 – 3 | 46 | 85.2 | 1.88(0.7 5– 4.72) | 0.178 | 2.1(0.72 – 6.13) | | 0.176 |
| 4 – 5 | 55 | 75.3 | 1 | | 1 | | |
| Child's sex | | | | | | | |
| Female | 67 | 85.9 | 2.69(1.11 – 6.48) | 0.028 | 3.99(1.42–11.16) | | 0.008 |
| Male | 34 | 69.4 | 1 | | 1 | | |
| Mother's age | | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 15 –24 | 43 | 79.6 | 1.04(0.29 – 3.77) | 0.95 | | |
| 25 - 34 | 43 | 79.6 | 1.04(0.29 – 3.77) | 0.95 | | |
| 35 - 45 | 15 | 78.9 | 1 | | | |
| Marital status | | | | | | |
| Single | 24 | 82.8 | 1.31(0.45–3.85) | 0.624 | | |
| Married | 77 | 78.6 | 1 | | | |
| Education status | | | | | | |
| No education | 3 | 37.5 | 0.1(0.02– 0 .54) | 0.008 | 0.1(0.01 – 0.64) | 0.016 |
| Primary education | 67 | 80.7 | 0.68(0.23 – 2.01) | 0.481 | 1.04(0.28 – 2.89) | 0.864 |
| Secondary education | 31 | 86.1 | 1 | | 1 | |
| Occupation | | | | | | |
| Unemployed | 25 | 86.2 | 1.81(0.57–5.76) | 0.315 | | |
| Employed | 76 | 77.6 | 1 | | | |
| CHWs ever talked to mother about breastfeeding during pregnancy and or after birth | | | | | | |
| Yes | 72 | 83.7 | 2.13 (0.88 –5.15) | 0.094 | 2.07 (0.72–5.98) | 0.178 |
| No | 29 | 70.7 | 1 | | | |
| Knew correct age a baby to receive only breast milk i.e.EBF for 6 months | | | | | | |
| Yes | 99 | 80.5 | 4.13(0.55–30.79) | 0.167 | 2.97(0.27–32.74) | 0.374 |
| No | 2 | 50.0 | 1 | | 1 | |
| Initiation of breastfeeding | | | | | | |
| Within 1 hour | 68 | 80.0 | 0.97(0.38 – 2.48) | 0.949 | | |
| More than 1 hour | 33 | 80.5 | 1 | | | |
| Have you ever seen an advertisement on television, radio, or in a magazine for breastfeeding? | | | | | | |
| Yes | 7 | 63.6 | 0.41(0.11–1.52) | 0.183 | 0.46(0.1–2.15) | 0.323 |
| No | 94 | 81.0 | 1 | | 1 | |
| Feed colostrum | | | | | | |
| Yes | 94 | 79.7 | 0.56(0.07– 4.77) | 0.595 | | |
| No | 7 | 87.5 | 1 | | | |

## Discussion

The prevalence of EBF practice reported in this study was 79.5% which was higher by 20% compared with the national EBF status (59%) revealed by the Tanzania Demographic and Health Survey [10] and the National Nutrition Survey (TNNS, 2018)[20] but lower by 11% than the prevalence of EBF recommended by the World Health Organization (90%) [2]. Similarly higher prevalence of EBF has also been reported in studies conducted in Ethiopia [21], Nigeria [22] and India [23] The higher prevalence reported in these two regions might be contributed by nutrition initiatives promoting optimal infant and young child feeding implemented in the areas by different development partners. Since 2004, UNICEF and other stakeholders have been implementing nutrition programs like the use of the Social Behavioral Change Communication (SBCC) Kit in promoting EBF practice, complementary feeding, and the use of maternal and child health services. Therefore, there is a need for the government to ensure consistent implementation of these initiatives and call upon other nutrition stakeholders residing in the country to complement the government's effort in promoting EBF in other regions. Conversely, the low prevalence of EBF was reported in a study conducted in Egypt [24], Saudi Arabia, Italy, and Kenya.

In this study, the multivariate analysis revealed a positive association between EBF practices and child sex, but a negative association between EBF practices and mother's education. Mothers with female children were nearly five times more likely to practice EBF than those with male children. The finding goes in line with the studies conducted in the Arab Emirates [25]. This might be explained by the false perception of mothers and the entire community to believe that male infants need to be masculine as early as possible, leading them to assume that other foods other than breast milk are crucial as early as possible. Accordingly, the government, in partnership with nutrition stakeholders, should continue to raise knowledge about EBF and dispel myths about it, so that all mothers, exclusively breastfeed their infants regardless of gender. Conversely, a study conducted in Egypt [24] found a higher likelihood of EBF practices for male infants compared with female children.

The low likelihood of mothers with no education practicing EBF was observed in this study. These findings mirror the studies conducted in Ethiopia [26], Ghana [27], and Nigeria [28]. Mothers with no education may also have less knowledge regarding infants' and young children feeding practices including the benefit of EBF. The efficacy of any nutrition initiative can be assured only if the rich and implemented by all people regardless of their educational background. Therefore, the government in collaboration with nutrition stakeholders should plan and implement all nutrition interventions by considering the inclusion of target population groups with a focus on those with less education. However, the findings of this study differ from those of a study done in India, Brazil, and Bangladesh, which revealed that less educated mothers were more likely to exclusively breastfeed their children than more educated mothers [29][30],[31].

The study setting and criteria for selecting study participants are considered the strength of this study as it includes mothers who are continuing breastfeeding. The small sample used in this

study is considered a limitation of this study as it made it difficult to generalize the obtained findings to the whole country. A large study to address the mentioned limitation is highly encouraged.

## Conclusion

This study found the majority of mothers practiced EBF so more effort to sustain this trend is essential. The child's sex and the mother's level of education were also found to be significantly associated with EBF practice in this study. Since EBF is the foundation for many infants' growth and survival, more efforts are encouraged at all levels to guarantee that all infants benefit from it. In addition, the government should emphasize on improvement and strengthening of the ongoing EBF counseling within the health system.

**Abbreviation:**
AOR: Adjusted Odd Ratio, BFHI: Baby-Friendly Hospital Initiative, CI: Confidence Interval, CHW: Community Healthy Worker, COR: Crude Odd Ratio, EBF: Exclusive Breastfeeding, HSP: Healthy service Provider, OR: Odds Ratio, NIMR: National Institute for Medical Research, SBSS: Social Behavioral Change Communication, TDHS: Tanzania Demographic and Health Survey, TNNS: Tanzania National nutrition Survey, UNICEF: United Nations International Children's Emergency Fund, USAID: United States Agency for International Development, WABA: World Alliance for Breastfeeding Action, WBW: World Breastfeeding Week, WHO: World Health Organization.

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**Conflict of interest:** The authors declare no conflict of interest.

**Ethics approval and consent to participate:**
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