

## The Effect of the “first 1000 days” mass communication intervention on maternal and child feeding practices in Mekelle City, North Ethiopia

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### Abstract

**Background:** Undernutrition is a major public health concern in Ethiopia. Interventions aimed at changing child feeding practices during the critical period from conception to the child's second year (the first 1000 days), have the potential to provide long-term benefits. In 2009 G.C, the “first 1000 days” campaign was launched in Ethiopia with the goal of improving feeding behavior in the first 1000 days of a child's life.

**Aim:** To assess the effect of the “first 1000 days” mass communication intervention on maternal and child feeding practices among mothers with children under the age of two years.

**Methods:** A nested mixed design post intervention only study was conducted in Mekelle city, Ethiopia. A total of 602 mothers with children aged under two years of age were included in this study. Ten in-depth interviews with mothers who had children under the age of two year and three key informant interviews were conducted for the qualitative study. Multiple linear regression analysis was used to identify predictors of feeding practices. Qualitative data was analyzed using thematic analysis.

**Results:** Over one third of mothers (47.31%) were exposed to the “first 1000 days” campaign. Exposure ( $\beta=0.34$ ,  $p<0.01$ ; 95% CI 0.16 to 0.53), age of the child ( $\beta= 0.03$ ,  $p<0.001$ ;95% CI 0.01 to 0.04), not watching television ( $\beta=- 0.52$ ,  $p=0.04$ ;95%CI -1.02 to-0.02), non-Tigrayan ( $\beta=-0.51$ ,  $p=0.01$  ;95%CI -0.93 to -0.08), and being widowed ( $\beta=-1.46$   $p=0.03$  95%CI -2.79 to -0.14) were predictors of feeding practices. The findings indicated that, women expressed enthusiasm for the media campaigns but struggled to understand some of the meanings of the messages due to the way the messenger spoke the local language. There were no pre-testing or evaluation strategies for the campaigns.

**Conclusion:** There is evidence that media campaigns can contribute to the improvement of recommended feeding practices. However, the quality of the message can be enhanced further and in so doing may affect behavioral change. Recognizing key behavioral determinants of feeding practices and incorporating them into campaigns designed with the local context in mind could be a critical first step in developing effective large-scale social and behavioral change programs targeted at feeding practices. [*Ethiop. J. Health Dev.* 2022; 36(1):000-000]

**Keywords:** first1000 days, mass media, behavioral change communication, undernutrition

### Background

Appropriate feeding practices among women and children are linked to a reduction in maternal and child malnutrition. Undernutrition is a condition caused by a relative or absolute lack of one or more essential nutrients. It encompasses wasting, stunting, being underweight, and vitamin and mineral deficiencies (1). It mostly affects women and children which results from a complex interaction of household, environmental, socio-economic, and cultural influences (2).

Undernutrition during pregnancy, affecting fetal growth, and the first 2 years of life is a major determinant of both stunting of linear growth, subsequent obesity, and non-communicable diseases in adulthood. It attributes for 45% of child deaths and 20% of maternal deaths worldwide each year (3). It is particularly prevalent in low and middle-income countries such as Ethiopia (2,4).

Efforts to improve dietary practices during the first 1000 days of life have been shown to break the vicious cycle of undernutrition(5). The first 1000 days of life

are in reference to the time between conception and the first two years of a child's life. Reaching out to women and communities with well-designed social and behavior change strategies aimed at promoting appropriate feeding practices has the potential to significantly reduce undernutrition (6). An earlier study estimated that delivering an infant and young child nutrition package, including breastfeeding and complementary feeding promotion, would save an estimated 221,000 lives (7). Raising awareness through behavioral change communication strategies in the first 1000 days of life is currently capturing the attention of programmers and policymakers all over the world (8).

Ethiopia is working to address maternal and child undernutrition as a priority agenda for the national nutrition program, focusing on the first 1000 days of life (9,10). The promotion of feeding practices is being disseminated through local media outlets, pertinent bodies, and the public at large (9).

The ‘first 1000 days’ mass media campaign has been one of the activities undertaken to improve Maternal and child nutrition. The campaign was launched in

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2009 G.C. It was developed by the Ministry of Health in Ethiopia and their technical working group along with various stakeholders. There were four campaigns with different key messages on nutritional behavior for the first 1000 days. The key messages of the campaigns were:

- 1) The meaning of the first 1000 days and the importance of optimal feeding practices in this period
- 2) Supplementation with iron and deworming during pregnancy, the importance of rest and an extra meal during pregnancy
- 3) Early initiation of breastfeeding within 1 hour, the importance of colostrum, exclusive breastfeeding, avoiding pre-lacteal feeding
- 4) Timely initiation of complementary feeding, frequency (three meals and two snacks in a day) and diversity of the food (diversity of 4 food groups), continuation of breastfeeding as needed (up to 2 years), husband support, and WASH (Water, Sanitation and Hygiene) (11)

The spots were aired on national and regional mass media stations in three languages (Amharic, Afan Oromo, and Tigrigna) for six months. The frequency of airing was three times per week and two times per day on television and daily throughout the week on radio.

Despite the potential impact of communication strategies on improving maternal and child feeding practices, there has been little evaluation of the potential effectiveness of mass media interventions. In low-income countries such as Ethiopia, limited human resources, gaps in message coverage and the dose of messages, insufficient use of local evidence, and limited efforts to contextualize the content, combined with a lack of formative assessments prior to embarking on the development and production of health communication materials, may undermine the effectiveness of such awareness-raising campaigns (12,13).

The noticeable roles that communication plays have pushed effective health communication to a new level of importance. The purpose of this study was to assess the effect of the “first 1000 days” mass communication on maternal and child feeding practices among mothers with children under two years of age in Mekelle, a regional city in northern Ethiopia.

## **Methods**

### **Study area**

This study was conducted in Mekelle city, a regional capital city in the northern part of Ethiopia. Mekelle is located 783 Kilometers from Addis Ababa (Capital city of Ethiopia). The city administration has 7 sub-cities or sub-locations, 35 kebeles (the Smallest admistartion ), and 105 ketenas.

### **Study Design, and Period**

A Nested mixed design post intervention only study was conducted from March 1 to April 30, 2018.

### **Sample size and sampling procedure**

The sample size was calculated using a single proportion population determination formula with the

following parameters: population proportion (P) assumed to be 50%, 95% CI, and 5% margin of error. The final sample size was 605 participants, considering the design effect of 1.5 and a 5% non-response rate.

A multistage sampling technique was used to select the study participants for the quantitative part of the study. Out of seven sub-cities, two sub-cities (Ayder and Hawelti) were selected using a simple random sampling technique. To obtain the desired sample size, all kebeles in the Two sub-cities were included. The total sample size was proportionally allocated to the selected kebeles based on the total number of eligible households. Finally, mothers with children under the age of two were selected using a systematic random sampling technique. Therefore, every 7<sup>th</sup> household was selected to participate in the study, to reach the desired sample size.

The qualitative study included individuals who worked on the development of the material for the "First 1000 days" for the federal and regional health bureau, as well as mothers of children under the age of two years. In-depth interviews were conducted with ten mothers, who had children under the age of two. They were purposefully chosen from the same sub cities. In the key informant interviews, three participants took part (two federal and one regional health bureau).

### **Data collection process**

For the quantitative data, a structured interviewer-administered questionnaire was initially prepared in English and then translated into the local language (Tigrigna). A Pre-test was conducted on 5% of the sample of mothers with children under the age of two who were not included in the actual data collection. Data was collected by trained data collectors using a face-to-face interview technique.

For the qualitative data, a semi structured interview guide was prepared in English then translated to Tigrigna and Amharic for the in-depth interview and key informant interview respectively. Principal investigators and trained data collectors conducted the interviews. The key informant interviews were conducted in Amharic and lasted about 40 minutes on average. The in- depth interview was conducted in Tigrigna. The duration of the interviews varied between 30 to 45 minutes. All interviews were recorded and then transcribed verbatim and then later translated into English for analysis.

The checklist was also used to score the quality of material using a clear communication index score developed by the CDC (Centers for Disease Control and Prevention). The checklist provided a set of research-based criteria to develop and assess public communication products. It included 20 items in four major parts. Based on this the material was assessed in the following seven areas: main message and call to action, language, information design, state of the science, behavioral recommendations, numbers, and risk (14).

### **Measurement of the study variables**

Feeding practice that were age appropriate were measured using a composite score of mother and child feeding practices by asking mothers about each recommended behavior during the first 1000 days (from pregnancy to two years of childhood) (15). Feeding practices were categorised as follows:

- Feeding practices for an infant from 0-6 months: composite index of initiation of breastfeeding, exclusive breastfeeding, an extra meal during pregnancy and received iron supplements and deworming during pregnancy.
- Feeding practices for an infant from 6-8 months: composite index of introduction of solid, semi-solid food, minimum dietary diversity, minimum meal frequency, early initiation of breastfeeding, extra meal during pregnancy and received iron supplements and deworming during pregnancy.
- Feeding practices for an infant from 9-19 months: composite index of minimum dietary diversity, minimum meal frequency, early initiation of breastfeeding, an extra meal during pregnancy and received iron supplements and deworming during pregnancy.
- Feeding practices for an infant from 20-23 months: composite index of minimum dietary diversity, minimum meal frequency and continuation of breast-feeding up to two years of age, early initiation of breastfeeding, an extra meal during pregnancy and received iron supplements and deworming during pregnancy.

Exposure to the campaigns was assessed by an aided recall measure, if the mothers had seen or heard the campaign during the previous 12 months prior to the interview. The sources and frequency of exposure was also assessed.

Message recall was measured unprompted first and then prompted. For confirmation of exposure to the key messages, the mothers who were exposed to the campaign was subsequently asked a set of questions about the main message, that they could recall.

Mothers attitude towards appropriate feeding practices which were recommended during the first 1000 days, was measured using a total of 5 questions on a five-point Likert scale. Scored from 1 - “strongly disagree” to 5 “strongly agree”. The sum score was computed and the higher the score, the more positive the attitude was perceived to be towards feeding practices. The internal consistency test for the items yielded a 0.6 Cronbach alpha.

Mothers intention to practice appropriate feeding during the first 1000 days was assessed using a total of five items on a five-point Likert scale, Scored as 1 for "strongly disagree" to 5 "strongly agree. The sum score was computed and the higher the score the more individuals were perceived to have intended to practice. The internal consistency test measure of intention yielded Cronbach's alpha of 0.7.

Quality of the spot: a clear communication index score was used to measure the quality of messages and materials. A spot that scored 89 and below was considered as poor and a spot that scored above 89 was considered as being good quality or acceptable for use (14).

#### **Data quality control**

The data quality was ensured throughout the data collection process. The tools were originally prepared in English and were then translated by individuals with a Masters degree who could read and write both languages (English and Tigrigna). To ensure consistency, the tool was translated back into English.

The training was provided for the data collection process and the techniques for data collectors. The questionnaire was pretested to ensure that the questions were not ambiguous. The principal investigator checked the data completeness, accuracy, and clarity carefully on a daily basis. Any error, ambiguity or incompleteness encountered was addressed on the same day prior to starting the next days activities. Principal investigators also rechecked for completeness and consistency prior to data entry.

For the qualitative data, member checking and peer debriefing were used to ensure the findings' credibility. At the end of each interview, member checking was used to test the interpretation of data. To ensure dependability, an audit trail of audio recordings and transcriptions was created, as well as a peer review. For cross-checking the process and maintaining consistency of the interpretations, audio recordings of participants' interviews, notes taken during the interview, and verbatim transcriptions were saved.

#### **Data analysis procedures**

The data was entered into SPSS version 20 after checking ensuring that it was up to date. Then it was exported to STATA 14 for cleaning and further analysis. Results from the descriptive analysis were presented using tables to explore the frequency, percentage, mean, and standard deviation. An independent t-test was used to compare the mean difference between mothers who were exposed and those who were not exposed to the campaign. A simple linear regression analysis was conducted to assess the association between all independent variables with feeding practices after checking for assumptions (normality test and multicollinearity). All variables with a p-value of less than 0.25 in the simple linear regression analysis were entered into the multiple linear regression, to identify the independent predictors of feeding practices. Standardized coefficients ( $\beta$ ) and Adjusted  $R^2$  (Coefficient of determination) values were used to interpret the effects and variability of the dependent variable respectively and statistical significance was set at  $p < 0.05$ .

The qualitative data from the interviews was analyzed using thematic analysis using open code 4.02 software. First, each interview was transcribed verbatim and translated into English. Major themes were determined

after understanding the text in its entirety. Texts were extracted and organized according to themes. In the end, quotations that represented the themes were used.

### Ethical considerations

Ethical clearance was obtained from an Institutional Review Board (IRB) form the Addis Ababa, University. The study participants were informed about the purpose and procedures of the study. They were also informed about their right to participate or to not participate in the study. A written informed consent was obtained from the study participants to be part of the study. This research utilized codes to ensure the privacy and confidentiality of the study participants.

For those who have not seen or heard about the first 1000 days of nutritional behavior, the interviewer shared the key messages of the first 1000 days.

### Results

#### Quantitative Results: *Socio-demographic and economic characteristics of Mothers*

Complete responses were obtained from 594 mothers result in a response rate of 98.1%. The mean age of the mothers was 28.69 (SD± 4.96) years old. Majority, 93.10% of the mothers were married and 80.98% were Ethiopian Orthodox Christian followers. Meanwhile, only 29.80% of mothers attained secondary school, while 47.47% were housewives. (Table -1)

**Table 1. Socio-Demographic and economic characteristics of the mothers Mekelle city, Ethiopia 2018.**

Variables		Frequency n=594	Percentage %
Mother age(yr)	15-24	121	20.37
	25-34	387	65.15
	35-49	86	14.48
Marital status	Single	19	3.20
	Married	553	93.10
	Divorced	19	3.20
	Widowed	3	0.51
Religion	Orthodox	481	80.98
	Catholic	71	11.95
	Protestant	27	4.55
	Muslim	15	2.53
Ethnicity	Tigray	567	95.45
	Non -Tigray *	27	4.55
Educational status	Illiterate	61	10.27
	Read and write	20	3.37
	Primary	119	20.03
	Secondary	177	29.80
	Technical/Vocational	102	17.17
	Higher	115	19.36
Occupational status	Housewife	282	47.47
	Govt employee	136	22.90
	Merchant	113	19.02
	Other**	63	10.61
Child Age in month	0-5month	192	32.20
	6- 11 month	160	26.94
	12-17month	176	29.63
	18-23month	66	11.11
Child Sex	Female	307	51.68
	Male	287	48.32
Functional TV	Yes	546	91.92
	No	48	8.08
Functional radio	Yes	223	37.54
	No	371	62.46
Source of information	TV	485	81.65
	Health extension worker	484	81.48
	Other health professionals	458	77.12
	Family/Friends/Relatives	229	38.60
	Radio	172	28.96
	Health development army	137	23.06
	Community conversation	59	9.93
	Community event	49	8.25
	Printed material ***	48	8.87
	Other****	29	4.72

\*(*Amhara ,Afar*),

\*\*(*Daily labour,student,farmer,private employee*)

\*\*\* (*Poster/Leaflets, or magazine,*),

\*\*\*\* (*Mobile text, internet*)

**Exposure to the “First 1000 days” television / radio campaigns:** Regarding potential access to mass media, 91.92% of mothers had a functional television and 37.54% had a radio. 81.65% of mothers use a television, 81.48% had access to health extension workers and 28.96% used a radio as a source of health information. Majority, 84.34% of mothers watched television daily and only 10.77% listened radio daily.

Of the total, 281 mothers were exposed to the campaigns. Among those who were exposed, 243 of mothers watched the campaign spot on television, while 38 (13.52%) listened to it on the radio. Those who said that they had seen the television campaign, said they saw it an average of six times, while those who said they have heard the radio spot said they heard it three times. The minimum exposure for the Television spot was one and a maximum of 20 times. In addition, the minimum and maximum exposure for radio spots were one and ten times, respectively.

**Recall of the key messages of the campaign:** Mothers who were exposed to television or radio campaigns were able to recall the key messages. The mean recall

was 8 with a standard deviation of 3.01. The most frequently mentioned key message was "exclusive breastfeeding," which was mentioned by 89.12% of mothers.

**Attitude and intention towards feeding practices:** (Table 2) indicates the overall mean score for mothers' attitudes toward feeding practices, which was 22.46, with  $SD \pm 1.74$ . An independent samples t-test result revealed there was no significant difference in attitude scores between the mothers who were exposed ( $M=22.6$ ,  $SD=1.63$ )  $N=281$  and those who were not exposed ( $M=22.4$ ,  $SD=1.84$ )  $N=313$  condition  $t(592) = -1.06$ ,  $p=0.289$ .

The overall mean score for intention was 21.14 with  $SD \pm 2.87$ . The results of an independent sample, t-test revealed that there was a significant difference in scores between those who were exposed to the campaign and those who were not,  $t(592) = 3.85$ ,  $p < 0.0001$ , exposed ( $M = 20.62$ ,  $SD = 3.01$ ) scoring higher than those who were not exposed ( $M = 21.53$ ,  $SD = 2.68$ ). The magnitude of the differences in the means (mean difference = 0.904, 95% CI:( 0.45 to 1.36)).

**Table 2: Mothers Attitude and intention toward feeding practice in Mekelle city, Ethiopia 2018**

Item	Strongly agree, frequency (%)	Agree frequency (%)	Neutral frequency (%)	Disagree frequency (%)	Strongly disagree frequency (%)	Item mean	SD
First milk (colostrum) is very nutritious to the baby.	324(54.55)	254(42.7)	12(2.0%)	4(0.7%)	0	4.51	0.58
Exclusive breastfeeding in the first six months will lead to improved child health status.	298(50.17)	294(49.4)	0	1(0.17%)	1(0.17%)	4.49	0.52
Giving at least 4-5 meals (including 1-2 snacks) per day for a child is appropriate.	329(55.39)	253(42.59)	9(1.52%)	2(0.34%)	1(0.17%)	4.53	0.57
Breastfeeding a child up to 2 years in addition to complementary feeding is important.	237(39.90)	319(53.70)	35(5.89%)	2(0.34%)	1(0.17%)	4.33	0.62
An extra meal during pregnancy is essential for fetal growth.	370(62.2)	220(37.04)	2(0.34%)	0	2(0.34%)	4.61	0.53
<b>Overall mean score of attitude <math>M= 22.46</math>, <math>SD\pm 1.74</math> <math>N= 594</math>, reliability <math>\alpha=0.6</math></b>							
I intend to exclusively breastfeed my child up to 6month.	253(42.59)	331 (55.72)	4 (0.67%)	0	6 (1.01%)	4.39	0.61
I intend to breastfeed my child up to 2years	256(43.10)	255 (42.93)	71 (11.95%)	12 (2.02%)	0	4.27	0.75
I intend to feed my child three meal and two snacks per day	239 (40.24)	262(44.11)	43(7.24%)	50(8.42%)	0	4.16	0.89
I intend to feed my child from the four groups of food.	212 (35.69)	294(49.49)	29(4.88%)	59(9.93%)	0	4.16	0.89
I intend to eat an extra meal while I am pregnant	241 (40.57)	266 (44.78)	33(5.56%)	54(9.09%)	0	4.17	0.89
<b>Overall mean score of intention <math>M= 21.14</math>, <math>SD\pm 2.87</math> <math>N= 594</math>, reliability <math>\alpha=0.7</math></b>							

### Maternal and child feeding practice

As shown in (figure 1), mothers were breastfeeding their children, majority of them, 86.44% initiated breastfeeding within 1 hour of birth. Colostrum feeding was higher among the mothers who were not exposed to the campaign, with 51.3% feeding their children

colostrum as compared to 48.27% of mothers who were not exposed to the campaign. Before they started breastfeeding, 64% of mothers said their babies were given liquids other than breast milk. The most common pre-lacteal foods were infant formula, honey, and plain water.

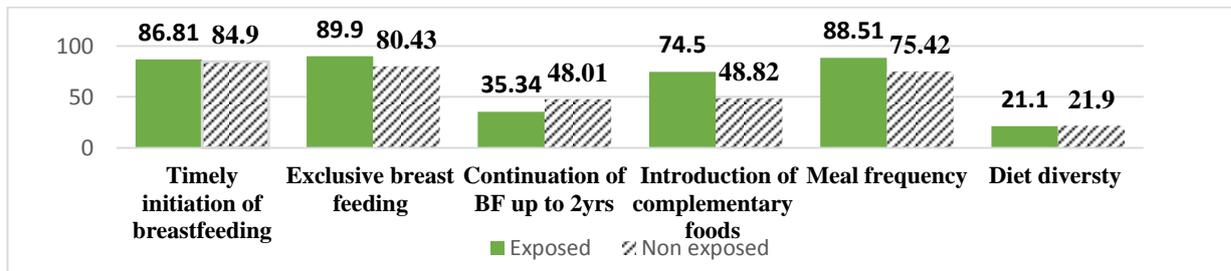


Figure 1: Appropriate IYCF among mothers exposed and non-exposed to the spots in Mekelle city, Ethiopia 2018.

The minimum meal frequency for breastfeeding infants aged 6-8 months who received solid, semi-solid, or soft foods prior to the interview was two times (8.66%), and the maximum frequency consumed was four times (39.14%). For the age group 9-23 months who were breastfed, 52.51% consumed solids four times, 43.34% consumed solids three times, and 4.21% consumed less than the recommended meal frequency for their age group.

Over one third (36.40%) of non-breastfed children aged 6-23 months who received solid, semi-solid, or soft foods or milk consumed less than the minimum meal frequency required for them, while 63.62% consumed more than the recommended meal frequency.

The proportion of children who consumed grains, roots, tubers, legumes, nuts, dairy products, meat, Vitamin A rich fruits, vegetables and fruits were 94.02%, 19.84%, 9.13%, 14.40%, 55.38%, 29.62% respectively.

In terms of appropriate maternal feeding practices during pregnancy, 72.56% of mothers ate an extra meal while pregnant, while 27.44% said they had made no dietary changes. About 51.34% of mothers who had been exposed to the campaign ate an extra meal.

Majority of mothers (88.05%) took iron supplements during their most recent pregnancy. Of them, more than half (53.24%) took the supplements for 90 days or more, 26.81% took the supplements for 60-89 days, and 20.15% took the supplements for less than 60 days. Only 19.19% of mothers took a deworming tablet.

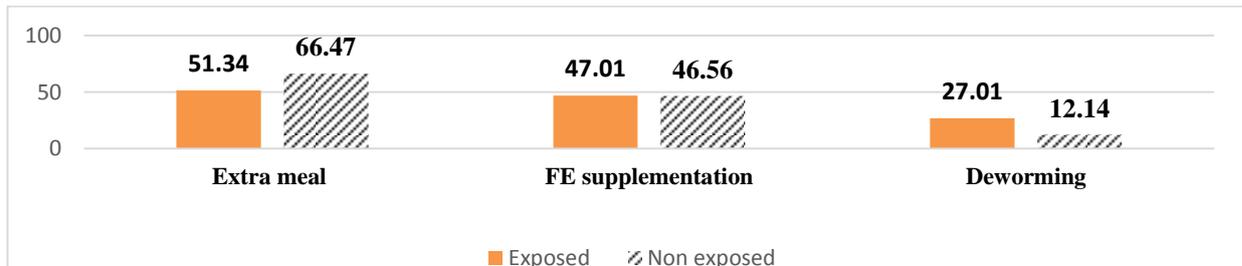


Figure 2: Appropriate maternal feeding practice among exposed and non-exposed in Mekelle City, Ethiopia 2018

**Relationship between the variables in terms of the hierarchy of communication (first 1000 days campaign)**

The key message was recalled by all the mothers who were exposed to the first 1000 days campaign. Half (50.53%), of the mothers who were able to recall the key message had a positive attitude towards maternal

and child feeding practices. Of the mothers with a positive attitude, 38.73% intended to adopt the recommended maternal and child feeding practices. Of those who intend to act, 27.27% practiced the campaign recommendations during pregnancy and 43.63% fed their children as recommended. (Figure 3)

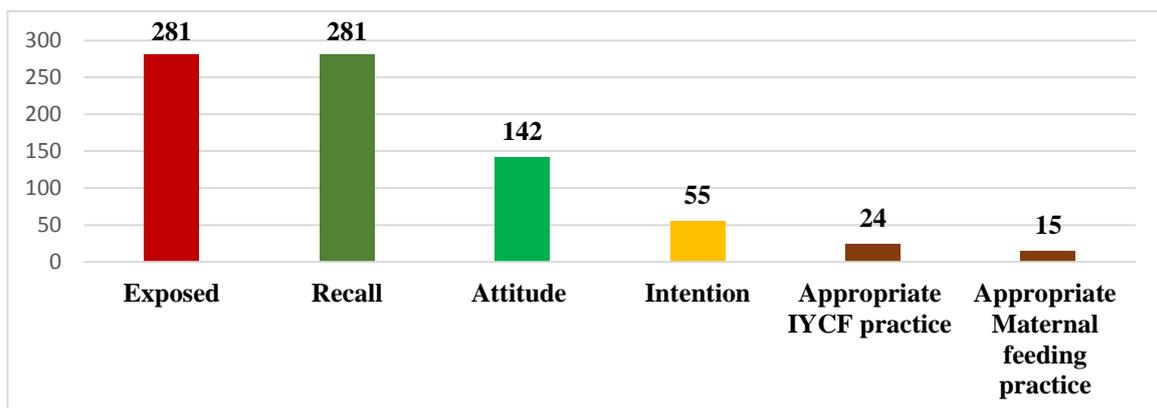


Figure 3: Hierarchical effect of 1000 days spots among mothers of under two children in Mekelle City, Ethiopia 2018.

**Predictors of the recommended feeding practices:**

Multivariate linear regression was used to test predictors of the recommended feeding practice, which were age appropriate. Table 3 indicates predictors which explained 8% of the variance (Adjusted  $R^2 = 0.08$ ,  $F$ -change=5.88,  $p=0.001$ ). After conducting the multivariable analysis, age of the child ( $\beta = 0.03$ ,  $p < 0.001$ ; 95%CI 0.01 to 0.04), exposure to the campaign ( $\beta = 0.34$ ,  $p < 0.001$ ; 95%CI 0.16 to 0.53), those who did not watch television at all ( $\beta = -0.52$ ,  $p = 0.04$ ; 95%CI -1.02 to -0.02), non-Tigrayan- ( $\beta = -0.51$ ,  $p = 0.01$ ; 95%CI -0.93 to -0.08) and those who were widowed ( $\beta = -1.46$ ,  $p = 0.03$ ; 95%CI -2.79 to -0.14) were predictors of feeding practice.

As the age of the child increased in months, the feeding practices also increased by 0.03 units. The effect of exposure to the campaign, increased feeding practices by 0.34 units among those who were exposed to the campaign as compared to those who were not exposed to the campaign. The effects of watching television on feeding practices decreased by 0.52 units among those who did not watch television at all as compared to those who watch television almost daily. Furthermore, the effect of marital status on feeding practices decreased by 1.462 units among widowed mothers as compared to single mothers.

**Table 3: Predictors of feeding practice appropriate to age on multiple linear regression analysis among mothers, in Mekelle City, Ethiopia, 2018**

Variable		Standardized coefficient ( $\beta$ )	p-value	95%CI (Lower Upper)	
Age of the child		0.03	0.000**	0.01	0.04
Marital status	Married	0.24	0.35	-0.26	0.74
	Divorced	0.29	0.41	-0.41	0.98
	Widowed	-1.46	0.03*	-2.79	-0.14
Ethnicity	Non-Tigray	-0.51	0.01*	-0.93	-0.08
	At least once a week	0.12	0.48	-0.19	0.40
Frequency of watching Tv	Less than once a week	0.15	0.67	-0.54	0.83
	Not at all	-0.52	0.04*	-1.02	-0.01
	Exposure	Yes	0.34	0.00**	0.16

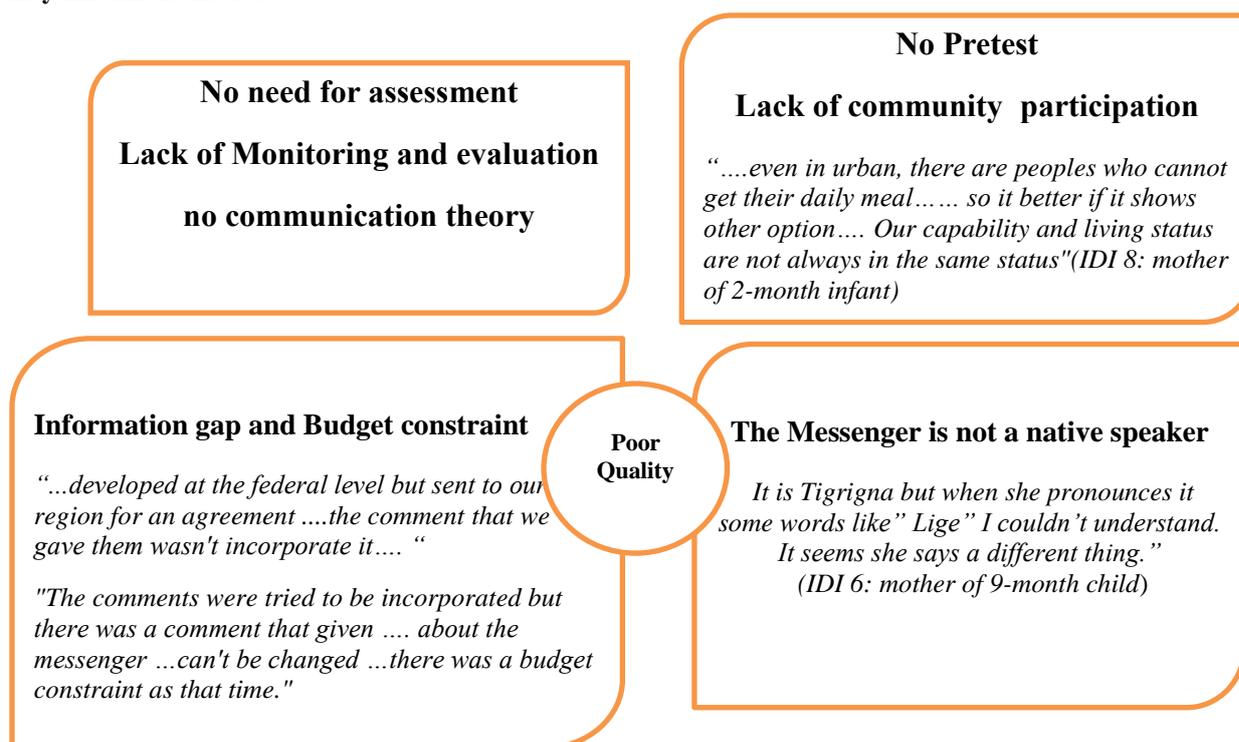
\*Statistically significant  $p < 0.05$ , \*\*  $p < 0.0001$

ref. Reference category Adjusted  $R^2 = 0.08$   $F$ -Change =5.88  $p=0.001$

**Qualitative study results: In-depth interview with mothers of under two children**

Ten mothers were interviewed to get their opinions on the campaign. All of them were biological mothers of the children. The mothers were in the age group of 21-32 years. seven of them were a housewife.

Theme	Findings
Comprehension: explored if the messages were easily understood by the mothers	Almost all of them mentioned it was easy to understand because it was not new for them, but they were confused with the naming of the campaign -1000 days “.....it a bit confusing me because we often count by month, not by days.....” (IDI 8:32yrs, housewife, mother of 2-month infant)
Appealing: explored the attractiveness of the campaign	The spots were well received especially its message, they also mentioned the way she expressed herself “I like it all ..., the way she explains about how we take care of the children and referee as "we" the responsibility of both parents that means mother and father, not as the only responsibility of the mothers.” (IDI 3:21yrs, housewife mother of 8-month child)
Resonance: explored if the campaigns were in check with the local culture	All of them said it reflected what it should however they did feel that the way in which the speaker pronounced some of the words was different to how native Tigrigna speakers pronounce them
Relevance: explored if the campaign was appropriate for the mothers and whether it would be helpful	All the participants indicated that they found the information to be significant
Call to action: explored if the campaign made them think or act differently, revealed from what they experienced	All of them revealed that the message prompted them to adopt proper feeding practices

**Key Informant Interview****Checklist results**

Based on CDC clear communication index all the campaigns scored below 89 which implies that the campaigns need to be improved (Table 4).

**Table 4: summary of checklist result based on CDC clear communication index**

Section of CDC index	Spot 1	Spot 2	Spot 3	Spot 4
	About First 1000 days	Exclusive breast feeding	Complementary feeding	Feeding practice during pregnancy
<b>Core</b>	9/11	8/11	8/11	8/11
<b>Behavioral recommendation</b>	3/3	3/3	2/3	3/3
<b>Number</b>	1/3	1/3	1/3	1/3
<b>Risk</b>	2/3	2/3	2/3	2/3
<b>Total score</b>	78.95	73.68	73.68	68.42

**Discussion**

Ethiopia is working to reduce undernutrition, and in so doing, it is necessary to promote the feeding practices recommended in the first 1000 days, as well as other interventions aimed at alleviating undernutrition. Mass media continues to be used as a platform to educate individuals regarding public health problems. Exposure is a critical first step in increasing awareness in terms of the recommended practices that may influence individuals to adopt a particular behavior (16).

Television was the most far-reaching communication channel for the campaign.

The reach of the campaign can also be increased through the monitoring of air times. One way to ensure that the intended audience is exposed to the message is to increase the frequency of airing time (17,18). According to the findings of this study, there was no monitoring or evaluation mechanism in place for the campaign. In contrast to the qualitative findings, the frequency of airing spots per day and other activities

were limited due to budget constraints. This could be due to a lack of funding. This is also evident in other public-health initiatives. Promotions get less funding as compared to other interventions most of the time (12). Furthermore, the cost of airtime was expensive, like the cost of beer advertisements or other advertisements, which is due to the lack of a supportive environment.

There was no need for assessments to be performed prior to the development of the campaign. Prior to the launch of a campaign, conducting a needs assessment allows for the identification of issues that should be addressed in messages, to develop a tailored message, assess current beliefs and practices, and to avoid costly mistakes during design, production, and implementation. This could be due to a lack of understanding and implementation of the desired behavior change in terms of communication and development. Similarly, a study conducted by practitioners in international development organizations to assess behavior change communication (BCC) practices devoted to infant and young child feeding (IYCF) in low- and middle-income countries found that formative assessments received little attention (19). However, formative assessments have been successful in the Alive and thrives IYCF projects(20).

Exposure to information does not guarantee attention to its contents. A significant positive correlation was observed between the recall of key messages and the frequency of watching the television campaign. Repeated exposure to campaigns leads to increased awareness, knowledge, and behaviors. Studies suggest that increased frequency of the campaign may have a positive impact on awareness (17,18,21,22). The likelihood of recalling the messages may be influenced by familiarity with the message. This is supported by the qualitative results, which indicate that mothers recall key messages quickly because they are familiar with them.

Attitude and intention were mediated factors on the path to engage in a behavior (23). In this study, between exposed and unexposed mothers, there is no significant difference in attitudes towards feeding practices. Formative research should be conducted to identify the issues that are most important in bringing about change. In this case, the media is seen as a means of reaching many people rather than as important mediators of change. Another reason could be perception, which is highly selective based on the cognition and values of the receiver. The campaigns airing time might not have been suitable for the mothers. In contrast, a study in Vietnam found that exposure to mass media was associated with greater knowledge, intention, beliefs, social norms, and self-efficacy about exclusive breast feeding as compared to exposure to either or none of these interventions. This difference might be due to the presence of interventions that were integrated with mass media (24).

Even though there was no significant difference in attitude between mothers who were exposed to the

campaign and those who were not, a positive correlation was found between attitude and the frequency of watching the television campaign. Multiple exposures to messages may have an impact on behavior and determine the rate and frequency of change. Individuals will have more time to process messages and learn about the ideas behind the behavior if they are exposed to them multiple times. This finding is like other evaluations of mass media campaigns (22,25–27).

In this study, there is a negative correlation between attitude and intention. Behavioral variables may have the opposite effect on steps involving the reception of information versus the approval of or processing of the information, as suggested by the Hierarchy of effects model (28). Even if they have a positive attitude, there may be factors that can make practicing the behavior difficult.

A significant difference was also found among exposed and non-exposed mothers in terms of their intention to practice. These results were consistent with a campaign evaluation in Nepal (22). Audiences may have an intention to practice what has been suggested because messages from television and radio are perceived as credible. The other possibility is that all data was self-reported, resulting in inflated positive responses; those who were exposed to the spot would be motivated to report positive aspects even if they did not intend to perform them on a regular basis, resulting in social desirability bias.

From other mass media campaigns, it has been found that mass media is an effective way to persuade target audiences to adopt new behaviors or to remind them of critical information. In this study, feeding practices among those who do not watch television at all decreased by 0.52 units as compared to those who watch television almost every day. Television is one of the channels used to disseminate health information. Those who watched television have a higher probability of being provided with essential messages. This might encourage them to develop an intention to practice. Other studies also indicated similar findings (24,29,30).

There was a significant association between exposure to the campaigns and age-appropriate feeding practices. This could be due to their exposure to the campaign, when combined with their prior knowledge, has compelled them to use the proper feeding techniques which is the adoption of behavior. Those who have adequate practices remember the campaign and believe it to be part of their prior knowledge. According to the qualitative research, the campaign did not provide them with new information, but it did remind them to practice what they already knew. It has been proven that the media has an impact on feeding practices through various nutritional behavioral change interventions (24,26,30,31).

Non- Tigray have indicated a decrease in feeding practices according to appropriate age by 0.51 units as compared to those who are Tigray. This could be due

to the reach of the campaign messages in the local language which ensures a deep understanding of content by priority audiences (32). Feeding practices decreased by 1.46 units among widowed mothers as compared to single mothers. It might be since mother face all the responsibility of the household and have low purchasing power since in Ethiopia most of the time husbands are expected to generate an income.

The poor quality of the spots indicates an insufficient campaign implementation plan. The message needs to involve a needs assessment and a pretesting (33). As per the qualitative findings, food items seen in the campaigns do not consider people with a low socioeconomic status. This could be due to a lack of community involvement and material pre-testing. Research suggests that mass media is most effective when it closely parallels with the lived reality of the target audiences (34). For this reason, developing and producing mass media programs requires collaboration with communities, local writers, and artists. Rather than disseminating basic knowledge, the adoption of optimal feeding practices can be sustained by disseminating a message that assists in overcoming barriers.

The persuasive power of a message can be boosted by using a credible, equal (target audience) and attractive messenger (34,35) However, using "her" as a messenger during the first 1000 days campaign may confine the campaigns' reach. The speaker was not a native speaker and was well-known in the region. Some words were difficult for her to pronounce. This could have made the message less credible and effective.

The creative brief was developed at the federal level then sent to the regional office to receive feedback for the local context. Even if it was sent, all comments provided by the region were not incorporate due to time and budget constraints. This indicates poor planning of the campaign and an information gap. This gap has been seen in different communication campaigns in Ethiopia (33,35–37).

The data used in this study was self-reported. As a result, mothers may have reported behaviors that are socially acceptable, which could lead to social desirability bias. If the interview took place on a different day, a 24-hour recall measure of feeding practices such as exclusive breastfeeding, may significantly overclassify individuals' responses who might have opted for a different response.

Due to the study's design, causality cannot be ascertained. The study did not use a baseline, so there was no way to compare before and after results, and there was no comparison group. Moreover, contamination of communication in health communication is uncontrollable.

### **Conclusion**

The effects of the "first 1000 days" campaign has been verified using the hierarchy of effects model. Mass media in the form of Television and radio are effective

in persuading and reminding individuals of critical information for target audiences.

Poor feeding practices, particularly insufficient breastfeeding and an inadequate quantity and quality of complementary feeding, are the root cause of poor nutrition among infants and young children in Ethiopia. Although media have made a significant contribution in improving the recommended feeding practices, the quality of the messages can be enhanced further in a way that can affect behavior change. But this can happen only when we develop effective communication strategies based on the proven principles.

The material development process did not follow proper procedures, resulting in poor material quality (the first 1000 days campaign). It is crucial to use a behavioral change theory when developing message strategies. All campaign materials should be pretested to ensure comprehension and relevance for the target audience. The community must be involved in the development, implementation, and evaluation of mass media campaigns that will help develop "what works" in their communities. Furthermore, because behavioral change intervention is an input for change, proper budgeting for implementation and a plan for ongoing monitoring and a summative evaluation should be in place to ensure that the appropriate outcomes are achieved.

This study was unable to determine causality, in future, studies using a strong design like quasi-experimental studies may be helpful to indicate the effects of the campaign and reverse causality.

### **Competing interest**

The authors declare that they have no competing interests.

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### **Authors' contributions**

YT, BK and EG initiated the research, wrote the research proposal, conducted the research, entered the data, analyzed the data, and wrote the manuscript.

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### **List of Abbreviation**

BCC - Behavioral change communication  
 CDC- Centers for Disease Control and Prevention  
 CI – Confidence interval  
 EBF- Exclusive Breast feeding  
 HEW- Health extension workers  
 IYCF- Infant and Young child feeding  
 SD - Standard Deviation

WASH- Water, Sanitation and Hygiene

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