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CLINICAL RESEARCH

Under-Five Mortality and Associated Factors among Children Born from 15-49 Years Old Mothers in Haramaya Town, Eastern Ethiopia

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ABSTRACT

BACKGROUND

Globally, since 2000, a decline in the underfive mortality rate has been recorded, indicating that over 50 million children's lives have been saved. More than 80 countries globally, specifically 69 developing nations, have reduced the underfive mortality by half since 2000. In the eastern part of Ethiopia, evidence from the Kersa Health and Demographic Surveillance System in the Kersa district of East Hararghe Zone, Oromia Region, suggested a decline in the underfive mortality rate from 131.8 per 1000 live births in 2008 to 77.4 per 1000 live births in 2013. The death rates still remain far from the Sustainable Development Goals' target reduction to 25 or less per 1000 live births by 2030. However, the magnitude and determinants of underfive mortalities have not been studied in Haramaya town.

OBJECTIVE

To assess the underfive mortality rate and its associated factors among children born from 7th August 2015 to 6th August 2020 in Haramaya town, east Ethiopia, by 7th-31st August 2020.

METHODOLOGY

A quantitative cross-sectional population-based study was conducted on 391 pairs of 15- to 49-year-old mothers and their live-born underfive children selected using a systematic random sampling technique from Haramaya town to compare child mortality between the <=24 and >=25 mother's age groups. Data were collected using an interview-based questionnaire, double entered into EpiData 3.1, and then exported to the statistical package for social sciences program version 20.0 for analysis. Binary logistic regression analysis (p value <0.20) was

performed to examine the crude association of predictors with underfive mortality, and then multiple logistic regression analysis (p value <0.05) was performed to measure the statistical association.

RESULTS

The deaths of 28 out of 372 live births resulted in an underfive mortality rate of 75 per 1000 live births. Children born in households with fewer than 6 members had 7. 98 times higher odds of dying than those born in households with at least 6 members (AOR = 7.98, 95% CI = 1.59-40.17). Those children who did not feed colostrum were associated with a 17.45 times increased risk of underfive deaths compared to colostrum-fed children (AOR = 17.45, 95% CI = 6.54-46.55).

CONCLUSION

The study suggests that 75 per 1000 live births die before celebrating their fifth birth day. Household size and colostrum feeding are significantly associated factors.

RECOMMENDATION

All concerned should inform the mothers of the role of identified factors such as household size and colostrum feeding in child survival.

KEYWORDS

Under-five mortality; Haramaya; Eastern Ethiopia

ABBREVIATION

ETB: Ethiopian Birr;

U5MR: Underfive Mortality Rate;

UFM: Underfive Mortality

INTRODUCTION

The child mortality rate (U5MR) has been widely used as an indicator of equality and human development [1]. The U5MR is defined as the probability (per 1,000 live births) that a child will die before reaching the age of five if subject to current age-specific mortality rates [2]. It is an important indicator that reflects the health of children and the development of the economy and culture of a country or region [3] It is one of the health indicators used by the World Health Organization (WHO) to assess a country's progress with improving the health of its citizens. The mortality of children under 5 years of age forms Goal 3 of the Sustainable Development Goals (SDG 3) to reduce the U5MR to at least as low as 25 per 1000 live births by 2030 [4]. In 1990, the United Nations Development Program (UNDP) introduced the Human Development Index (HDI), which has three aspects: longevity, knowledge, and life standards measured by life expectancy at birth, a combination of adults' literacy and enrolment rate, and gross domestic product (GDP) per capita, with the main aim of creating a more comprehensive measure of the human development program [1].

Globally, since 2000, a decline in the underfive mortality rate has been recorded, indicating that over 50 million children's lives have been saved. More than 80 countries globally, specifically 69 developing nations, have

reduced the underfive mortality by half since 2000 [5]. However, this progress is not equally distributed at the national and subnational levels [2].

From an ecological study in West and South Asian countries, the highest rate of decrease was related to India (167.6 to 59.9 in 100 live births from 1980-2010) and Iran (109.9 to 19.2 in 100 live births from 1980-2010) [1]. There are few studies on subnational child mortality (CM) in Iran, but a published report by the Iranian Ministry of Health showed that in 2010, more than 91% of mortality in the neonatal period and more than 63% of mortality 1 to 59 months after birth occurred in Iranian hospitals [2]. Deaths in neonates accounted for more than 50% of all deaths among children under age 5 during the 24 consecutive years under investigation in Beijing [6].

African children are nearly 16 times more likely to die under age five than children from high-income nations, although progress in Africa is being made [7]. U5MR in the sub-Saharan region has remained unabated [8]. Many countries, especially those from sub-Saharan Africa, were unable to reach the Millennium Development Goal for under5 mortality reduction by 2015. The current U5MR (per 1,000 live births) was 133 in the Republic of Chad, 104 in the Democratic Republic of Congo, 95 in Mali, 127 in Niger, and 69 in Zimbabwe [8].

In Ethiopia, it declined substantially in most of the Health and Demographic Surveillance System (HDSS) sites during the last 10-15 years [3]. For instance, evidence from the Kersa HDSS in Kersa district of East Hararghe Zone, Oromia Region, Eastern Ethiopia suggested the decline of U5MR from 131.8 per 1000 live births in 2008 to 77.4 per 1000 live births in 2013 [9]. The prevalence rate of underfive deaths in Ethiopia was 67 per 1000 live births from the Ethiopian Demographic Health Survey (EDHS) 2016 [10]. This represents a 60% decrease in underfive deaths over the period of 16 years since 2000, when there were 166 deaths per 1000 live births [5].

It seems that improving maternal education level, increasing age at marriage, and the birth gap between two births have an important role in decreasing U5MR in India [1]. For girls, there are also major benefits for the next generation: half of the reduction in under5 mortality achieved in the last 30 years may be attributable to increased maternal education [11].

METHODOLOGY

Study Area and Period

Haramaya town is situated in the East Hararghe Zone, Oromia Regional State, Ethiopia. It is located 21 km northwest of Harar town and 505 km east of Addis-Ababa, the capital city of Ethiopia. The elevation at the site ranges from 2018 meters to 2422 meters above sea level (m. a. s. l). The watershed lies at a UTM (Universal Transverse Mercator) coordinate of 171212 East and 1040190 North. It is characterized by a “Woina-Dega” agroclimatic zone that receives a mean annual rainfall of 775.9 mm. The monthly rainfall at the site is more than 100 mm from April to September, except June 48.4 mm. The wettest month is August, 151.9 mm. The daily temperature at the site ranges from 10°C -25°C. The livelihood in the area is based on agriculture. Therefore, different agricultural practices are practiced within the Lake Haramaya watershed [12]. The town has one primary hospital and is divided into 3 administrative kebeles and 24 subkebeles, where 9, 7 and 8 of them belong to kebeles 01, 02 and 03, respectively. The estimated population of the town was 50960, of which 8373 were expected to be children under five years of age. Of the population, 19030 (3127 underfive), 18214 (2993 underfive) and 13716

(2253 underfive) were expected to live in kebeles 01, 02 and 03, respectively. The childhood mortality status in the town is still unknown. The study was conducted starting from August 07-31, 2020 (Figure 1).

Figure 1: Location map of the study area.

Study Design

A community-based cross-sectional study design was selected.

Source and study population

Source population

All pairs of 15- to 49-year-old mothers lived, and their children were born alive in Haramaya town in the past five years.

Study population

All 15- to 49-year-old mother-live-born under-five child pairs who were living in randomly selected subkebeles of Haramaya town during the study.

Inclusion and Exclusion Criteria

Inclusion criteria

All 15- to 49-year-old mothers who had had live births in the past five years were included.

Exclusion criteria

Mothers who either had had multiple births like a twin or could not respond due to serious illness were excluded. Multiple births were excluded because of the known higher risk of neonatal mortality due to pregnancy complications and preterm birth among multiple births compared to singleton births to avoid potential confounding effects [13,14].

Sample size determination

The sample size calculated using the single population proportion formula $n= (z_{\alpha/2})^2 \pi(1-\pi)/d^2$ for specific objective one (to determine the under-five mortality rate among the last children born in the past five years in Haramaya town) is as follows, where n is the sample size, π is population proportion and d is precision required in %.

$= (1.96)^2*0.067(1-0.067)/0.05^2$

= 3.8416*0.067(0.933)/0.0025

= 0.24/0.0025

=96

Furthermore, the sample size was also calculated with the double population proportion formula $N=2*\frac{[(z_{cv}\sqrt{2\bar{p}(1-\bar{p})}+z_{power}\sqrt{p1(1-p1)+p2(1-p2)})^2]}{(p_1-p_2)^2}$ for specific objective two of this study: identify the factors associated with underfive mortality among the last children born in the past five years in Haramaya town as indicated in table 1 below using the following assumptions: confidence level of 95% and 5% significance level [15].

r = n1/n2= 1:2

Zα/2=1.96 (the value of the standard normal distribution curve corresponding to confidence interval 95%)

Zβ= 0.84 (the value of the standard normal distribution curve corresponding to 80% power

de = 1.5 (design effect)

P1= percent outcome among unexposed

P2= percent outcome in exposed

$\bar{P}=\frac{P1+P2}{2}$

Table 1: Sample size calculation.

Variable	P1 (%)	P2 (%)	P (%)	CI	Power	Unexposed to the exposed ratio	Total sample size
Maternal education	4.7	34.9	19.8	95%	80%	0.077	52
Maternal age	10.5	50	30.25	95%	80%	2.054	40
Age at first birth	17.7	33.5	25.6	95%	80%	0.218	**237**
Birth order	4.8	49	26.9	95%	80%	0.504	29

Since the sample size calculated for specific objective two accommodated the largest sample size, it was (237 × 1.5) + 10% = 391. Therefore, the minimum total sample size considered to undertake the study was 391 after considering a design effect of 1.5 and a nonresponse rate of 10%.

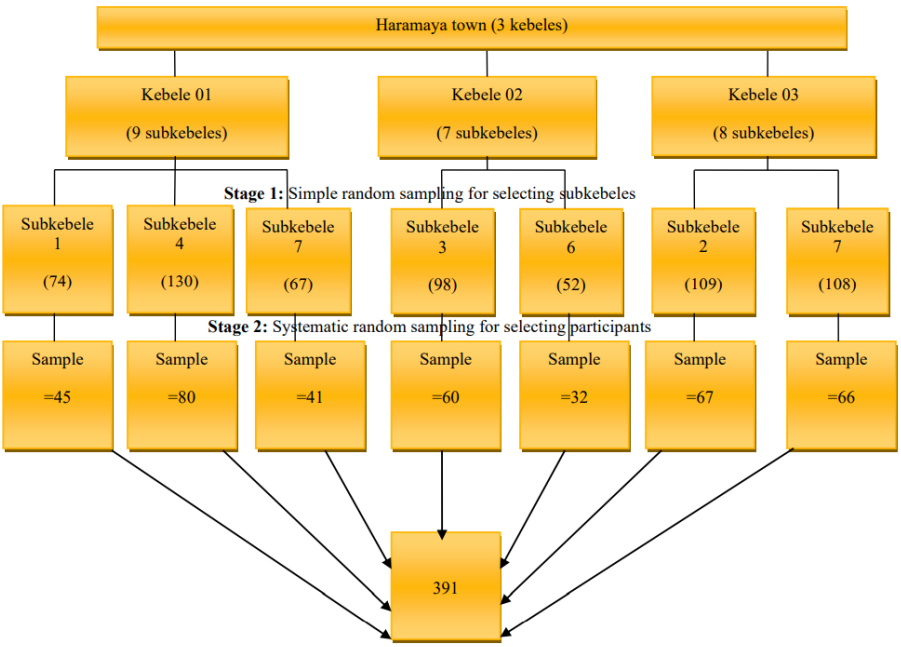

Figure 2: Sampling procedure for selecting subkebeles and study participants in Haramaya town.

Sampling Procedure/Technique

Participants were selected using two-stage sampling among 638 mothers 15-49 years old who were identified before the study and whose births had been registered by the vital events registration agency. A simple random sampling method was used to select subkebeles from all 3 kebeles of Haramaya town proportional to their population size. Accordingly, 3 of the 9 subkebeles of kebele 01 (subkebeles 1, 4 and 7), 2 of the 7 of 02 (3 and 6) and 2 of the 8 of 03 (2 and 7) were selected. Then, systematic random sampling was performed to select participants independently from the selected subkebeles proportional to their respective number of mothers of underfive children identified. Since the sampling interval was 1 for all subkebeles, the sample was taken starting from the first cases. Finally, the study was conducted on 391 participants, as shown in Figure 2 below.

Data Collection Methods

Data collection tool

The data collection tool consisted of socioeconomic, sociodemographic, environmental, and health-related characteristics that would affect under-five mortality. A questionnaire for primary data that included 17 structured and open-ended questions was adopted from different studies included in its review as socioeconomic, biodemographic, environmental, and health-related factors (13-18) in English and then translated into Afan Oromo by language experts. Again, the Afan Oromo version was translated back into English to make it consistent. Data were collected using the Afan Oromo structured and open-ended questions.

Data collectors

Three nurses who had previous experience in data collection were selected among my coworkers and given training. Then, they collected data according to the schedule already set.

Data collection procedures

Data were collected home-to-home using an interview-based questionnaire from fifteen study participants daily for the first twenty-two days and then from fourteen participants daily for the last three days based on the time available for data collection. The data collection process was supervised and continuously followed up by the principal investigator throughout the data collection period.

Variables

Dependent variable

- Underfive mortality.

Independent variable

Independent variables and the conceptual framework are shown in Figure 3.

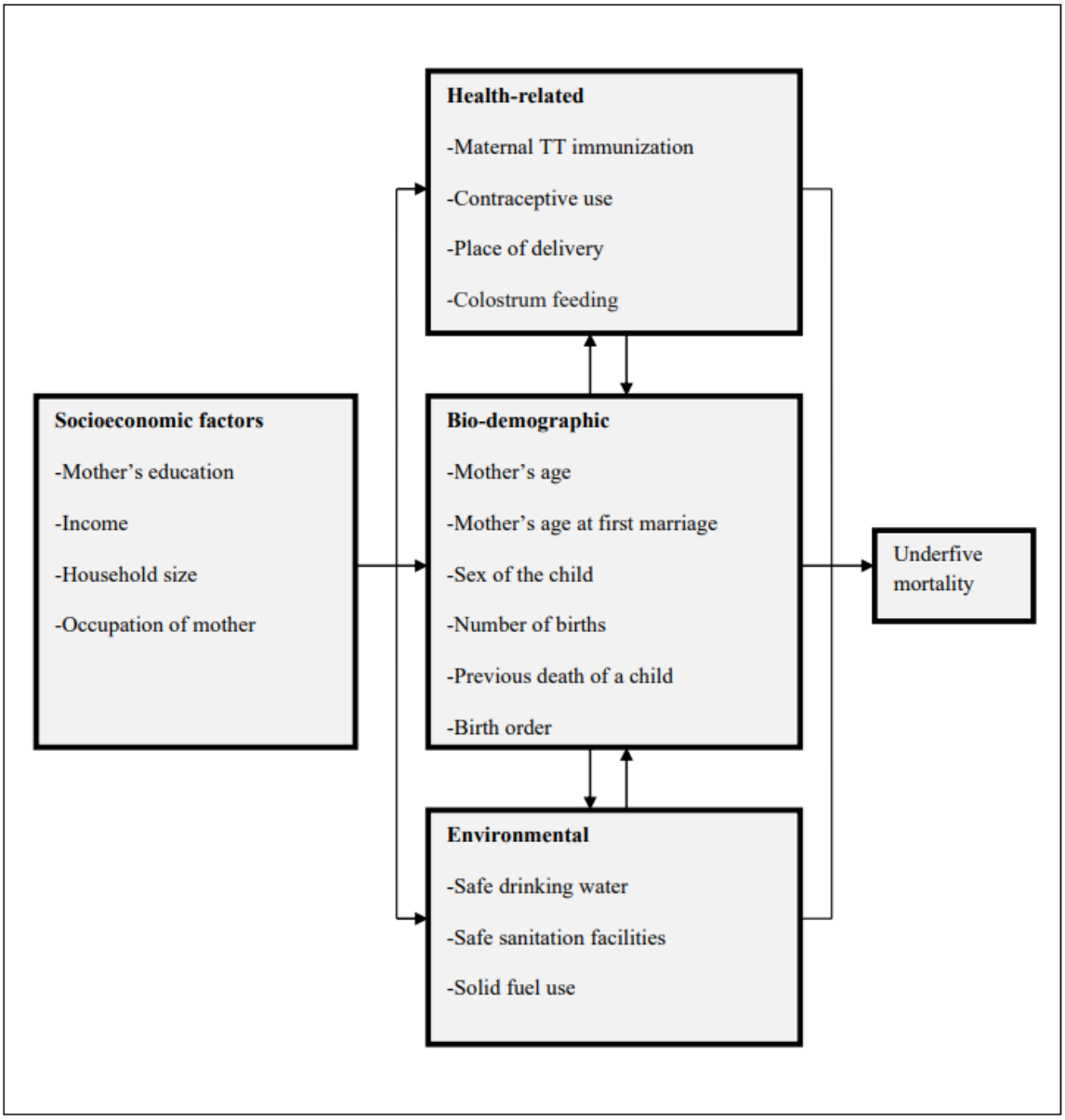

Figure 3: Conceptual framework illustrating factors influencing the under-five mortality of children adapted and modified from different reviewed studies.

RESULTS

Socio Demographic Characteristics

Out of the calculated sample of 391 mothers included in this study who had had singleton live births from 7 August 2015 to 6 August 2020, 372 (95.14%) responded to the home-to-home interview. The median age of the current mothers was 24.5, with a standard deviation of +/- 5.81824. The range of mothers' ages was 15 to 45. The majority of the births (52.4%) were males; 64.2% were in households with no more than 5 members. Of the mothers, 86.0% fed their child colostrum (Table 2).

Under-five Mortality Rate

Out of 372 singleton live births from 7 August 2015 to 6 August 2020, 28 (7.5%) died. This gave a weighted U5MR of 75 per 1000 live births. Children born in households with fewer than 6 members experienced higher

mortality rates. Significantly higher U5MR was also recorded among children who did not feed colostrum (p <0.001).

Table 2: Socio-demographic characteristics and distribution of under-five mortality rate in Haramaya town, east Ethiopia, 2016-2020 (n = 372).

Variables	N (%)	Under-five mortality		U5MR[a] (95% CI[b])
		Yes (%)	No (%)	
Mother's Education				
No Formal Education	120 (32.3)	9 (7.5)	111 (92.5)	75 (27.0, 123.0)
Primary School	150 (40.3)	13 (8.7)	137 (91.3)	87 (41.0, 132.0)
Secondary School & Above	102 (27.4)	6 (5.9)	96 (94.1)	59 (12.0, 105.0)
Income (ETB)				
<1700	34 (9.1)	7 (20.6)	27 (79.4))	206 (63.0, 349.0)
>=1700	338 (90.9)	21 (6.2)	317 (93.8)	62 (36.0, 88.0)
Household Size				
<=5	239 (64.2)	22 (9.2)	217 (90.8)	92 (55.0, 129.0)
>5	133 (35.8)	6 (4.5)	127 (95.5)	45 (9.0, 81.0)
Occupation of Mother				
Housewife	232 (62.4)	13 (5.6)	219 (94.4)	56 (26.0, 86.0)
Government Employee	40 (10.8)	5 (12.5)	35 (87.5)	125 (18.0, 232.0)
Daily Labourer	26 (7.0)	5 (19.2)	21 (80.8)	192 (30.0, 355.0)
Others	74 (8.6)	5 (6.8)	69 (93.2)	68 (9.0, 126.0)
Maternal TT Immunization				
One or no TT	43 (11.6)	5 (11.6)	38 (88.4)	116 (16.0, 216.0)
Two or more TT	329 (88.4)	23 (7.0)	306 (93.0)	70 (42.0, 98.0)
Contraceptive Use				
Never Used	164 (44.1)	16 (9.8)	148 (90.2)	98 (52.0, 143.0)
Ever Used	208 (55.9)	12 (5.8)	196 (94.2)	58 (26.0, 90.0)
Place of Delivery				
Home	67 (18.0)	6 (9.0)	61 (91.0)	90 (19.0, 160.0)
Health Facility	305 (82.0)	22 (7.2)	283 (92.8)	72 (43, 101)
Colostrum Feeding				
Yes	320 (86.0)	11 (3.4)	309 (96.6)	34 (14.0, 54.0)
No	52 (14.0)	17 (32.7)	35 (67.3)	327 (195.0, 459.0)
Mother's Age				
<=24	187 (50.3)	12 (6.4)	175 (93.6)	64 (29.0, 100.0)
>=25	185 (49.7)	16 (8.6)	169 (91.4)	86 (46.0, 127.0)
Mother's Age at First Marriage				
<18	372 (100.0)	28 (7.5)	344 (92.5)	75 (48.0, 102.0)
>=18				
Sex of the Child				
Male	195 (52.4)	16 (8.2)	179 (91.8)	82 (43.0, 121.0)
Female	177 (47.6)	12 (6.8)	165 (93.2)	68 (30.0, 105.0)
Number of Births				
>4	87 (23.4)	8 (9.2)	79 (90.8)	92 (30.0, 154.0)
3-4	119 (32.0)	7 (5.9)	112 (94.1)	59 (16.0, 102.0)
<=2	166 (44.6)	13 (7.8)	153 (92.2)	78 (37.0, 120.0)
Previous Death of a Child				
Yes	59 (15.9)	6 (10.2)	53 (89.8)	102 (22.0, 181.0)
No	313 (84.1)	22 (7.0)	291 (93.0)	70 (42.0, 99.0)
Birth Order				
>=Fourth	133 (35.8)	10 (7.5)	123 (92.5)	75 (30.0, 121.0)
Second or Third	156 (41.9)	10 (6.4)	146 (93.6)	64 (25.0, 103.0)
First	83 (22.3)	8 (9.6)	75 (90.4)	96 (32.0, 161.0)
Safe Drinking Water				
Yes	372 (100.0)	28 (7.5)	344 (92.5)	75 (48.0, 102.0)
No				
Safe Sanitation Facilities				
Yes	95 (25.5)	8 (8.4)	87 (91.6)	84 (27.0, 141.0)
No	277 (74.5)	20 (7.2)	257 (92.8)	72 (42.0, 103.0)
Solid Fuel Use				
Yes	356 (95.7)	26 (7.3)	330 (92.7)	73 (46.0, 100.0)
No	16 (4.3)	2 (12.5)	14 (87.5)	125 (-57.0, 307.0)

[a]Weighted under-five mortality rates as 'deaths per 1000 live births'; [b]Confidence interval; TT = Tetanus Toxoid

Factors Associated with Under-Five Mortality

In bivariate analysis (p <0.20), households earning less than 1700 ETB per month, households with fewer than 6 family members, mothers working as house wives, mothers who had never used any contraceptive, children not

colostrum-fed, mothers aged <=24 years, and mothers who had more than 4 births were found to be candidates for multivariate analysis (Table 3).

Table 3: Crude association of predictors with under-five mortality of children in Haramaya town, east Ethiopia, 2016-2020 (n = 372 and p <0.20).

Variables	N (%)	Under-five mortality		COR (80% CI)	P-value
		Yes (%)	No (%)		
Mother's Education					
Secondary School	102 (27.4)	6 (5.9)	96 (94.1)	1.00	.
No Formal Education	120 (32.3)	9 (7.5)	111 (92.5)	0.77 (0.28, 2.11)	0.735
Primary School	150 (40.3)	13 (8.7)	137 (91.3)	1.04 (0.44, 2.46)	0.958
Income (ETB)					
>=1700	338 (90.9)	21 (6.2)	317 (93.8)	1.00	.
<1700	34 (9.1)	7 (20.6)	27 (79.4))	2.77 (1.18, 6.50)	0.127
Household Size					
>5	133 (35.8)	6 (4.5)	127 (95.5)	1.00	.
<=5	239 (64.2)	22 (9.2)	217 (90.8)	10.56 (3.52, 31.72)	0.006
Occupation of Mother					
Daily Labourer	26 (7.0)	5 (19.2)	21 (80.8)	1.00	.
Housewife	232 (62.4)	13 (5.6)	219 (94.4)	0.23 (0.08, 0.62)	0.060
Government Employee	40 (10.8)	5 (12.5)	35 (87.5)	0.54 (0.17, 1.70)	0.493
Others	74 (8.6)	5 (6.8)	69 (93.2)	0.53 (0.15, 1.86)	0.518
Maternal TT Immunization					
Two or more TT	329 (88.4)	23 (7.0)	306 (93.0)	1.00	.
One or no TT	43 (11.6)	5 (11.6)	38 (88.4)	2.29 (0.89, 5.92)	0.262
Contraceptive Use					
Ever Used	208 (55.9) 164	12 (5.8)	196 (94.2)	1.00	.
Never Used	(44.1)	16 (9.8)	148 (90.2)	2.42 (1.26, 4.64)	0.084
Place of Delivery					
Health Facility	305 (82.0)	22 (7.2)	283 (92.8)	1.00	.
Home	67 (18.0)	6 (9.0)	61 (91.0)	1.48 (0.68, 3.24)	0.522
Colostrum Feeding					
Yes	320 (86.0)	11 (3.4)	309 (96.6)	1.00	.
No	52 (14.0)	17 (32.7)	35 (67.3)	21.45 (10.64, 43.22)	0.000
Mother's Age					
>=25	185 (49.7)	16 (8.6)	169 (91.4)	1.00	.
<=24	187 (50.3)	12 (6.4)	175 (93.6)	0.33 (0.13, 0.88)	0.146
Sex of the Child					
Female	177 (47.6)	12 (6.8)	165 (93.2)	1.00	.
Male	195 (52.4)	16 (8.2)	179 (91.8)	0.80 (0.42, 1.52)	0.655
Number of Births					
<=2	166 (44.6)	13 (7.8)	153 (92.2)	1.00	.
>4	87 (23.4)	8 (9.2)	79 (90.8)	10.60 (1.67, 67.44)	0.102
3-4	119 (32.0)	7 (5.9)	112 (94.1)	1.60 (0.57, 4.47)	0.560
Previous Death of a Child					
Yes	59 (15.9)	6 (10.2)	53 (89.8)	1.00	.
No	313 (84.1)	22 (7.0)	291 (93.0)	1.65 (0.64, 4.27)	0.498
Birth Order					
First	83 (22.3)	8 (9.6)	75 (90.4)	1.00	.
>=Fourth	133 (35.8)	10 (7.5)	123 (92.5)	0.55 (0.09, 3.24)	0.666
Second or Third	156 (41.9)	10 (6.4)	146 (93.6)	0.90 (0.33, 2.43)	0.888
Safe Sanitation Facilities					
Yes	95 (25.5)	8 (8.4)	87 (91.6)	1.00	.
No	277 (74.5)	20 (7.2)	257 (92.8)	0.48 (0.22, 1.03)	0.220
Solid Fuel Use					
Yes	356 (95.7)	26 (7.3)	330 (92.7)	1.00	.
No	16 (4.3)	2 (12.5)	14 (87.5)	1.86 (0.53, 6.51)	0.528

COR = Crude Odds Ratio; CI = Confidence Interval; TT = Tetanus Toxoid

In multivariate analysis, household size and colostrum feeding status were significant factors associated with under-five-year mortality in children (Table 4). Children born in households with fewer than 6 members had 7.98 times higher odds of dying than those born in households with at least 6 members (AOR = 7.98, 95% CI = 1.59-40.17, P <0.05). Those children who did not feed colostrum were associated with a 17.45 times increased risk of underfive deaths compared to colostrum-fed children (AOR = 17.45, 95% CI = 6.54-46.55, P <0.001). The wide confidence intervals might be attributable to the small sample size of the study.

Table 4: The factors associated with under-five mortality of children in Haramaya town, east Ethiopia, 2016-2020 (n = 372 and p <0.05).

Variables	N (%)	Under-five mortality		AOR (95% CI)	P-value
		Yes (%)	No (%)		
Income (ETB)					
>=1700	338 (90.9)	21 (6.2)	317 (93.8)	1.00	.
<1700	34 (9.1)	7 (20.6)	27 (79.4))	2.40 (0.73, 7.93)	0.149
Household Size					
>5	133 (35.8)	6 (4.5)	127 (95.5)	1.00	.
<=5	239 (64.2)	22 (9.2)	217 (90.8)	7.98 (1.59, 40.17)	0.012
Occupation of Mother					
Daily Labourer	26 (7.0)	5 (19.2)	21 (80.8)	1.00	.
Housewife	232 (62.4)	13 (5.6)	219 (94.4)	0.25 (0.06, 1.02)	0.053
Government Employee	40 (10.8)	5 (12.5)	35 (87.5)	0.54 (0.11, 2.74)	0.458
Others	74 (8.6)	5 (6.8)	69 (93.2)	0.53 (0.10, 2.89)	0.466
Contraceptive Use					
Ever Used	208 (55.9)	12 (5.8)	196 (94.2)	1.00	.
Never Used	164 (44.1)	16 (9.8)	148 (90.2)	2.33 (0.90, 6.05)	0.083
Colostrum Feeding					
Yes	320 (86.0)	11 (3.4)	309 (96.6)	1.00	.
No	52 (14.0)	17 (32.7)	35 (67.3)	17.45 (6.54, 46.55)	0.000
Mother's Age					
>=25	185 (49.7)	16 (8.6)	169 (91.4)	1.00	.
<=24	187 (50.3)	12 (6.4)	175 (93.6)	0.38 (0.10, 1.41)	0.147
Number of Births					
<=2	166 (44.6)	13 (7.8)	153 (92.2)	1.00	.
>4	87 (23.4)	8 (9.2)	79 (90.8)	5.01 (0.75, 33.42)	0.096
3-4	119 (32.0)	7 (5.9)	112 (94.1)	1.31 (0.35, 4.88)	0.686

AOR= Adjusted Odds Ratio; CI= Confidence Interval

DISCUSSION

The prevalence rate of underfive deaths in this study was 75 per 1000 live births, which is higher than the 59 underfive deaths per 1000 live births reported by the Bhutan National Health Survey 2012 [13] and the 67 per 1000 live births in Ethiopia reported by the 2016 Nationwide Survey Data analysis [17]. However, it is lower than 104 mortalities per 1000 live births evidence from the Nepal Demographic and Health Survey (2001-2016) [14]. The explanation for this difference might be due to differences in sample size, study setting, and operational definition.

In this study, household size was significantly associated with underfive mortality. This study found that household size was inversely associated with underfive mortality, consistent with the finding from Bhutan [13]. The findings support the view that larger households may have better resources, such as more experienced child care providers and more working-age adults, contributing to household income. In contrast, another finding in the Ethiopian Somali Regional State suggested that the mortality risk of children increases as the size of the family increases [16]. In this view, a larger family size may indicate more children, leading to intrasibling competition for limited resources and inadequate attention and care for children heightening their mortality risk. However, the findings in this study suggest that a larger family size is protective against UFM in Haramaya town, possibly through more people caring for the child and resources.

The other prominent factor associated with underfive mortality in this study was colostrum feeding practice after birth. The death rate was significantly higher among children not colostrum-fed, in line with the study findings from Bhutan [13]. Colostrum is the first milk containing proteins, vitamin A and maternal antibodies. A study conducted in the Afambo district of Afar Regional State showed that colostrum feeding was significantly associated with stunting, wasting, and underweight [20]. The rest of the variables were not significantly associated with UFM in this study. For instance, there was no association between UFM and mother's age, unlike the study

result in other parts of Ethiopia, which stated that it was significantly lower among children born from mothers whose age was less than or equal to 24 compared to those born from the reference group [15]. Mother's education was also not associated with UFM in Haramaya town. A similar report was obtained in a study from Ethiopian Somali Regional State [16] and in other parts of Ethiopia [17]. The findings of this study suggest that strengthening health education, particularly on exclusive breastfeeding practices, can improve child survival.

Strengths and Limitations of the Study

Clear concept and explanation of the article with proper information is its key strength. Author's approach and interest in the study is another strong side of the article. Tabular presentation of data in the article also makes it strong. No weakness of the article than the need for references to be cross checked due to inline reference.

CONCLUSION

The study suggests that 75 per 1000 live births die before celebrating their fifth birth day in Haramaya town. Household size and colostrum feeding status are the factors associated with the underfive mortality of children in the town.

RECOMMENDATIONS

Based on the findings of this study, the Haramaya town health office should disseminate information to mothers about the benefits of feeding their children colostrum and promote the practice. The office, in collaboration with other relevant sectors and programs, should do its best in strengthening child care services.

The East Hararghe zonal health department should take part in the allocation of a sufficient budget for all these activities, including research. It should also closely monitor and evaluate changes that will occur.

In addition, further research at the regional and national levels will enable us to understand the magnitude and associated factors of children's mortality under age five using a larger sample size and including variables not included in this study, such as mother's age at first birth.

DECLARATION

Ethical Considerations

The study was conducted after the proposal was approved by HU, CHMS IHRERC (Haramaya University, College of Health and Medical Sciences Institutional Health Research Ethics Review Committee). Informed, voluntary, written and signed consent was obtained from each mother or husband in case of a minor. The privacy and confidentiality of the participants were assured. The selection of the mothers was also equitable and fair. There was no risk of participating in this study compared to taking a few minutes from their time. The findings from this research revealed important information for the local health planners even though there was no direct payment for participating in the study. They also had the right to participate or not and could even withdraw at any time once they decided to participate.

Availability of Supporting Data

Supporting data and materials owned by the corresponding author are available upon necessary request.

Conflict of Interest

None.

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We did not receive any funding from anywhere.

Authors' Contributions

MA and MD designed the writing, and MA conducted the literature review. MD and ZT took part in the analysis and interpretation of data for the work. AD and MA critically revised the manuscript for important intellectual content. Finally, NA approved the version to be published.

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