FASTING DURING RAMADAN AND ASSOCIATED FACTORS AMONG MUSLIM LACTATING MOTHERS, AT PUBLIC HEALTH CENTERS OF JIMMA TOWN, OROMIA, SOUTH WEST ETHIOPIA

BY: ABDULHAMID A/RESHAD (BSC)

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JIMMA, ETHIOPIA

JIMMA UNIVERSITY

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ADVISORS: DR. KALKIDAN HASSEN (Associate Professor)

MS.YABSRA MELAKU (Bsc, Msc)

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ABSTRACT

Background: Nutrition experts recommend optimal dietary intake during lactation to meet the nutritional requirement of infants. Religious and cultural factors are usually found to have substantial influence maternal dietary intake. It is plausible to consider fasting during this period as important factor to hinder lactation quantity and quality. However, many nursing mothers fast during Ramadan and continue breast feeding.

Objective: To assess the magnitude of Fasting during Ramadan and associated factors among Muslim lactating mothers, in public health centers of Jimma town, Oromia, South west Ethiopia, 2021.

Methods: Facility based cross -sectional study was conducted in Jimma town from January1 to July 30, 2021. Structured questionnaire was used to collect the data from 375 lactating mothers selected consecutively. Epi data 3.1 was used for data entry and SPSS version 20 was used for analysis. The descriptive statistics was employed first. After bivariate; Binary logistics regression was used, those with p-value ≤0.25 was entered in to multiple Logistic regression, to identify independent predictors of fasting. AOR was used to assess the magnitude of association while, 95% CI and p-value ≤ 0.05 was used to assess the significancy of association.

Results: The response rate of this study was 97%. The magnitude of fasting during Ramadan among the studied Muslim lactating mothers was 67.86%. The finding reported; maternal attitude towards effect of fasting on composition of breast milk (AOR: 0.591; 95% CI: 0.371, 0.943), having low social supports (AOR: 0.493; 95% CI: 0.248, 0.977) and having poor knowledge (AOR: 1.629; 95% CI: 1.238, 2.687) were the factors significantly associated with fasting during Ramadan.

Conclusion: The significant number of lactating mothers were fasting in the current study setting. Lactating mothers, should discuss with health workers before deciding to fast in Ramadan.

Key words: Knowledge, Attitude, Ramadan Fasting, lactating mothers.

ACKNOWLEDGEMENTS

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ABBREVIATIONS AND ACRONYMS

CI: Confidence interval

EDHS: Ethiopian Demographic and Health

ENA: Essential nutrition action

EPI: Expanded program of immunization

ETB: Ethiopia birr

ETP: Estimated total population

FGA: Family guidance association

HC: Health center

Higher 2: Higher two

HO: Health officer

JHC: Jimma health center

LM: lactating mother

MLM: Muslim lactating mother

PCA: Principal component analysis

RR: Relative risk

SPSS: Statistical package for social science

SRP: Student research project

UNICEF: United Nations Children's Fund

WHO: World Health Organization

CHAPTER 1. INTRODUCTION

1.1. BACKGROUND

Ramadan is the 9th month of the Islamic Lunar calendar. Fasting during the month of Ramadan is fundamental obligation for every healthy adult men and women [1]. In addition to this, fasting in Ramadan is one of the five pillars of islam that include; announcement of faith, praying five times a day, Zakat, fasting during the month of Ramadan and Hajj (pilgrimage once in a life time) [2]. During this month, Muslims abstain from activities like; eating, drinking and sexual intercource from sunrise to sunset [3]. The fasting period per day may vary depending on the geographical location of the country and the season of the year, and can be as long as 18hrs/day in the summer [4].

Fasting in Ramadan has the following purposes for Muslims; to learn self-restraint from indulgence in every day pleasure, for self-discipline, to develop god consciousness, to develop self control, to purify the body and to emphathize with the poor and hungry [5,6].

According to the religious dogma, certain groups of people are exempted from fasting, including; pre pubertal children, the frail elderly, acutely unwell, travelers who journey more than 50 miles, menstruating women, pregnant and nursing women, who are worried about their health and/or child and those with mental retardation [4]. A clear exemption for breastfeeding women is found in the tradition of the prophet Mohammed as referred by Anas Ibn Malik. Allah has remitted half of the prayer for the traveler and (he has remitted) fasting for the traveler, the women who breast fed an infant and the women who is pregnant [5]. Breastfeeding women, who feel themselves or their babies will be harmed by fasting was exempted from fasting but, the missed fasts must be completed before the next Ramadan [23].

Many muslim women choose to fast during Ramadan for spiritual reasons or becouse they find it more difficult to fast alone a later [5]. By, another study, breastfeeding

women choose to fast becouse of social, religious and cultural factors [9]. Agreing to this study, social pressure from family and spiritual are the reasons, why they used to fast [7].

The nutritional value of human milk composition may vary individually and depends on lactation phase, time of day and night, duration of sucking the breast in individual feeding or time of pumping session and the nutritional status of breastfeeding mother may also affect energy density and contents of individual nutrients [17]. To have good nutritional status the breastfeeding woman has to increase nutrient intake [13]. The carbohydrate, protein, fat, calcium and iron contents of breast milk do not change much, even if the mother is short of these in her diet. However, the mother whose diet is deficient in thiamine, vitamins A and D produces less of these in her milk [14].

The unique biological benefits of human milk justify the promotion of breastfeeding as the ideal method for feeding infants [15]. Increased intake of certain nutrients or the use of certain supplements in lactating women is recommended to satisfy the demands of milk production and to protect the infant from nutrient deficiencies [16]. Taking care of healthy nutritional status of breastfeeding women is especially important in regard to a metabolic programming revealed [18].

A breastfeeding women wish to fast during Ramadan, should take extra calories to maintain adequate breast milk production [10]. They should consume copious nutritious liquids like; Fruit juice, buttermilk, coconut water during the non-fasting period, should monitor their overall health, the quantity of food, and take an individualized decision, in consultation with the health care workers [11].

In addition, health workers should give advise lactating mothers to hydrate and consume nutritious foods during the predawn and evening meals and make precautions against excessive daytime activity, and explain the warning signs that warrant breaking the fast, such as decreased fetal movement, extreme fatigue or dizziness, or nausea with vomiting, if they choose to fast [12].

1.2. STATEMENT OF THE PROBLEM

WHO's package of Essential Nutrition Actions (ENA) focuses on high impact investments in nutrition, including women's nutrition, early initiation of breastfeeding and exclusive during the first six months of life, complementary feeding from six months [19].

Human milk provided by healthy, well-nourished mothers is the optimal nutrition for infants as it contains a uniquely balanced profile not only for macronutrients, but also for micronutrients, antibodies, hormones and bioactive molecules [20].

The nutritional linkage between mothers and their children is affected by inadequate access to nutrition and unhealthy dietary behavior, making the first 1,000 days of life, from conception to 24 months after birth, a vital window of opportunity for reducing undernutrition and its adverse effects [21]. Lactation raises nutrient needs, mainly because of the loss of nutrients, first through colostrums and then through breast milk [13]. Breast milk volume varies widely. The nutrients present in the milk come from the diet of the mother or from her nutrient reserves [14].

The routine of Ramadan fasting obligates abstinence from all food and liquid items from the crack of dawn until sunset [22]. The nutritional status of lactating women is affected by Ramadan fasting, by decreasing all nutrient intakes (except vitamins A, E and C) [25]. In addition, fasting of Ramadan by lactating mothers, significantly affects proteins, carbohydrates and electrolytes in breast milk [42]. By different study, significant differences on some micronutrients contents of breast milk was reported [25].

There is clear exemption from fasting for breastfeeding women [23]. However, many muslim womens choose to fast during Ramadan with rest of family members, becouse of social pressure from family, spiritual reasons and fear of difficulty to fast alone a later [5,7,9]. These all factors had challenged health care providers to provide medical

advice to Muslim women regarding health issues related to fasting during Ramadan [7].

For instance, in Ankara,Turkey, up to 52% [24], ayidin,Turkey 50% [28], Lahore, Pakistan 57% [29] and najran, Saudi Arabia 89.9% [30] of breastfeeding mothers were fasting in Ramadan.

Since, the most appropriate infant-feeding pattern is breastfeeding, especially in the first 6 months of life, some nutrisionist have suggested that the barriers which interfere with breastfeeding need to be removed, and facilities and confidence should be provided for breast-feeding mothers [26]. However, many nursing mothers who fast during Ramadan and are concerned for reduction in milk volume for their infants, hence complemented their infants with food [27].

A study conducted in turkey reported 22% of breastfeeding mothers perceived a decrease in their breast milk production, and 23% stated an increased complimentary infant supplements provision during Ramadan. The same study indicated 40%, 47% and 66% of infants 2 months, 3 months and 6 months of age, respectively, receiving complimentary food supplements [24]. This is alarming as it exposes the infants to inappropriate feeding practice and increased risk of infection.

To our knowledge, studies on this topic are scarce, hardly available particularly from countries of low income setting. Therefore, the aim of this study was to assess magnitude of fasting during ramadan and associated factors among Muslims lactating mothers attending public health centers of Jimma town, Oromia, South west Ethiopia, 2021.

1.3. SIGNIFICANCY OF THE STUDY

The study determines the magnitude of fasting during ramadan among Muslims lactating mothers and its associated factors. The finding of the current study will be used as inputs for policy makers to evaluate implementation of ENA programs that facilitate maternal nutrition during lactation and exclusive breast feeding and promote its implementation. The researcher can use this study as baseline, to identify the possible factors associated with low rate of exclusive breastfeeding and maternal nutrition in our country. The finding will be used by health professions, to deliver effecive health education, for lactating mothers regarding fasting in Ramadan.

This finding will help the government, to decrease maternal and child hood morbidity and mortality. The current finding will help lactating mothers, to get correct councelling to enhance their nutritional status and to make individual decision regarding fasting in Ramadan.

Finally, the result of this study can be used us baseline for future studies on this specific areas.

CHAPTER 2 . LITERATURE REVIEW

2.1 Concept and overview of fasting duing Ramadan among lactating mothers.

WHO gives emphasis on ENA that include exclusive breastfeeding, complementary feeding, nutrition for women during pregnancy and lactation[19]. Many scholars agreed that, breast milk is the best nutrition for infants during the first six months after birth and highly recommended to continue breastfeeding along with supplementary foods up to two years of age [31].

However, breastfeeding practices can be affected by different factors like, maternal factors such as stress, anxiety, and smoking can decrease milk production [32]. In other ways, unhelpful hospital policies and staff actions, lack of ongoing social support, and others people's negativity, maternal attitude and low self-efficacy are factors adversely affect the continuation of breastfeeding by mothers [33, 34]. The systematic review done in British; supported the idea, social support and guidance from family and friends have a significant impact on the initiation and duration of breastfeeding [35].

The nutrients present in the breast milk come from the diet of the mother or from her nutrient reserves [14]. The composition and volume of breast milk varies based on childs age [36], type of nutrients [37] and mothers diet [38]. The studies done by zikowskas et al, to identify the correlation between human milk composition and maternal nutritional status, revealed; There is correlation between human milk composition and maternal nutritional status, especially in matters of energy value and fat content in human milk [39].

According to the study done in Ankara, Turkey; The nutritional status of lactating women is affected by Ramadan fasting [25]. Despite, all mothers can produce adequate amounts of breastmilk, a chronical deficient dietary intakes by mothers depletes her energy, vitamins and minerals stores [50].

In other ways, the study done on "Impact of Maternal Ramadan Fasting on Growth Parameters of Exclusively Breast-fed Infants" in Iran, reported, Ramadan fasting by breast-feeding mothers did not adversely affect the growth parameters (weight, height, and head circumferences) of exclusively breast-fed infants in short-term [45]. The previous study in turkey, supported the idea "the growth of infants was not affected by maternal fasting of Ramadan" [25]. However, potential changes in micronutrients or bioactive components in breast milk due to fasting, have effects on infant growth and development [46,47].

2.2 Magnitude of Fasting during Ramadan among lactating mothers

A cross sectional study done in ayidin,Turkey, reported; The rate of fasting in Ramadan among lactating mothers are 50% [28]. The cross sectional study done in Well-child care clinic at Ankara University Medical School and a health station serving an impoverished population in Ankara, Turkey, reported; 52% of breast feeding mothers were fasting [24].

A descriptive community based study done in Lahor, Pakistan reported; 57% of breastfeeding mothers were fasting in Ramadan [29]. Descriptive cross-sectional study done in najran, Saudi Arabia on Knowledge, attitude and practice of Saudi women in Najran area towards breastfeeding during Ramadan, reported; 89.9% used to practice breastfeeding while fasting [30].

2.3 Socio demographic factors associated with fasing during Ramadan among lactating mothers

A ccording to the cross sectional study done in ayidin,Turkey; age of babies, having the first baby were significantly associated with fasting. [28]. By the study done in Ankara, Turkey, Infants aged 6 months or younger, receiving well-child care at the health station, giving supplements and having multiple childrens were the variables significantly associated with fasting in this study [24]. From the study done in Singapore, being multiparous women are found to be more likely to fast [7].

2.4 Knowledge of lactating mothers towards fasing during Ramadan

According to religious view; any breastfeeding women, who feel themselves or their babies will be harmed by fasting was exempted from fasting [23]. A lactating mothers who want to fast during Ramadan should be advised by health workers to hydrate and consume nutritious foods during the predawn and evening meals and make precautions against excessive daytime activity, and explain the warning signs that warrant breaking the fast, such as decreased fetal movement, extreme fatigue or dizziness, or nausea with vomiting [12].

By different study, lactating mothers needs to fast should consume copious nutritious liquids like; Fruit juice, buttermilk, coconut water during the non-fasting period, should monitor their overall health, the quantity of food, and take an individualized decision, in consultation with the health care workers [11]. From the study done in Singapore; Lacking the basic religious knowledge regarding Islamic law on fasting were significantly associated with fasting [7].

2.5 Attitude of lactating mothers towards fasting during Ramadan

The study done in ayidin,Turkey reported; Believing that breastfeeding women can fast and believing that fasting can affect breast milk production were the variables significantly associated with fasting status [28]. In addition to this, the study done in Well-child care clinic at Ankara, Turkey; Belief that breastfeeding mothers should fast, fasting does not decrease breast milk, were the variables significantly associated with fasting [24].

The previous study done in najran, Saudi Arabia; Majority of study participant believed that fasting during Ramadan is not an excuse to stop breastfeeding and it had no effect on the breast milk and growth of infants. By the same study, the significant number of study population believed that fasting does not alter the composition of breast milk [30]. Many muslim women choose to fast during Ramadan becouse they find it more difficult to fast alone a later [5].

2.6 Social support of lactating mathers on fasting during Ramadan.

According to study done on *"Health Beliefs and Practices of Muslim Women During Ramadan"*, breastfeeding women choose to fast becouse of social, religious and cultural factors [9]. Agreing to this the previous study done in Singapore reported; social pressure from family and spiritual are the reasons, why lactating mothers choose to fast[7].

2.7 Conclussion

Breast milk is the best nutrition for infants [31]. The nutrients present in the breast milk come from the diet of the mother or from her nutrient reserves [14]. There is correlation between human milk composition and maternal nutritional status, especially in matters of energy value and fat content in human milk [39]. Fasting of Ramadan by lactating mothers, significantly affects proteins, carbohydrates and electrolytes in breast milk [42]. In addition it had significant differences on some micronutrients [25]. There are studies done in ayidin,Turkey, Ankara University, Turkey and najran, Saudi Arabia to assess Knowledge, attitude and practice of breastfeeding women towards fasting in Ramadan [28,24,30]. However, in developing countries like Ethiopia, the studies on this topic is scarce.
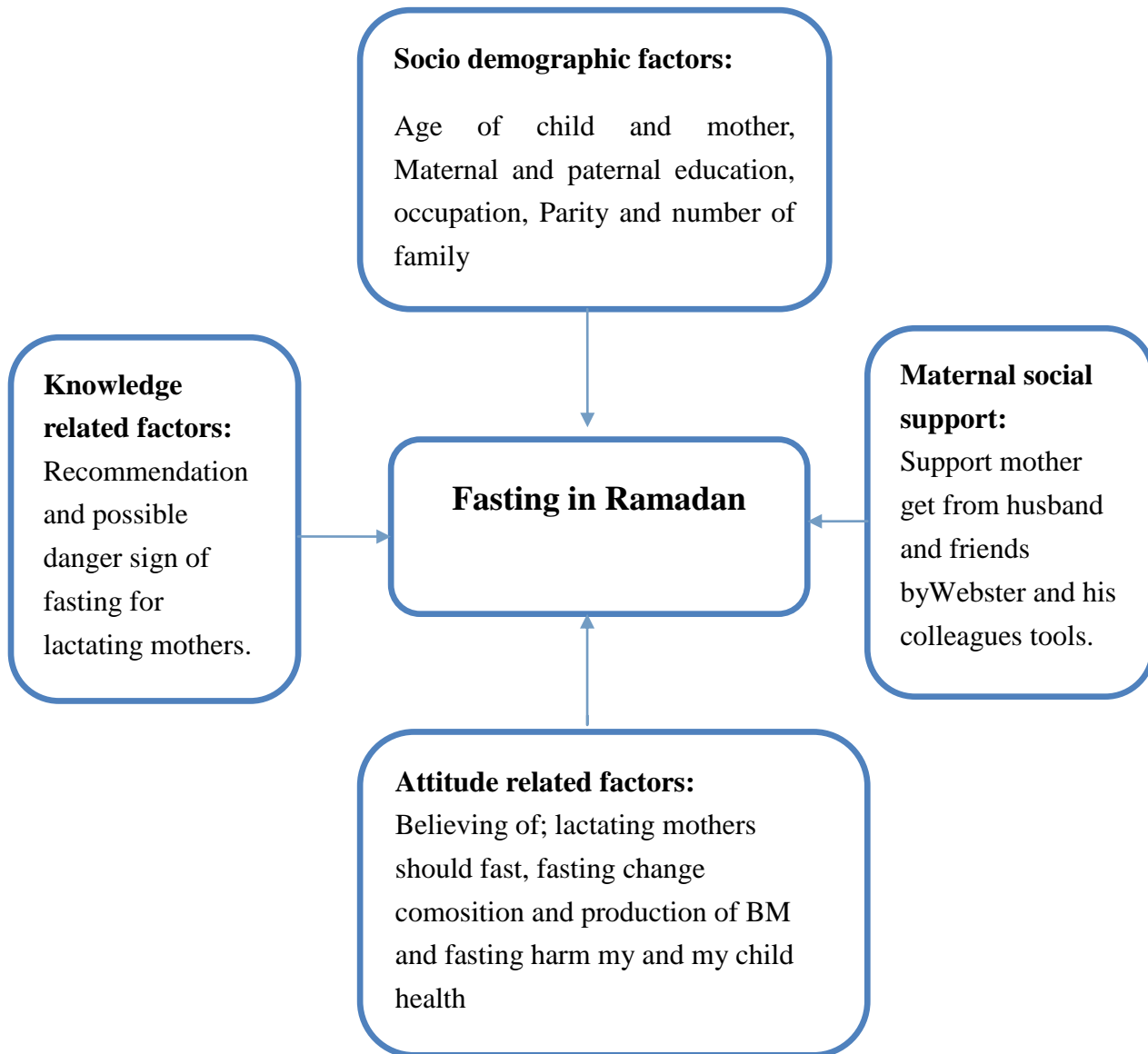
Fig 1.Conceptual frame work of factors associated with fasting during Ramadan among muslim lactating mothers [7, 24, 28, 30, 53].

CHAPTER 3. OBJECTIVES

3.1 General objective

To assess the magnitude of Fasting during Ramadan and associated factors among Muslim lactating mothers, at public health centers of Jimma town, Oromia, South west Ethiopia, 2021.

3.2 Specific objectives

1.To determine the magnitude of Fasting during Ramadan among Muslim lactating mothers, at public health centers of Jimma town, Oromia, South west Ethiopia, 2021.

2.To identify factors associated with Fasting during Ramadan among Muslim lactating mothers, at public health centers of Jimma town, Oromia, South west Ethiopia, 2021.

CHAPTER 4. METHODS AND MATERIALS

4.1. Study area and period

4.11. Study area

This study was conducted in **Jimma Town;** it is found in Oromia Region, South West of Ethiopia at 352 km from capital city of the country, Addis Ababa. The town has an altitude of 1750-2000m above sea level, temperature range of 20-30°C and average annual rainfall of 800-2500mm3. According to the data gotten from Jimma town health bureau the estimated total population of the town in 2013 is 220,609 (110,922 males and 109,687 female), Among them 3.47% (7655) are lactating mothers [51]. According to 2007 CSA 39.3% of total population are Muslim in Jimma town [52]. There are 2 public hospital,4 public health center, 18 health posts,3 private hospital,25 pharmacy,32 drug store,38 medium clinic,7 dental clinic,8 primary clinic and one FGA in Jimma town. From 7655 lactating mothers in the town, 3008 are estimated to be Muslim, according to 2007 CSA data. Therefore making source population of 3008 [51,52].

The study was conducted in all four public health centers in Jimma town, which includes; Jimma health center, Higher two, Mandera kochi and Bacho bore health center.

4.12. Study period

This study was conducted from January1 to July 30, 2021.

4.2. Study design

Facility based cross -sectional study was conducted

4.3. Population

4.31.Source population

All Muslim lactating mothers attending their child health at public health centers of Jimma town.

4.32. Study population

Selected Muslim lactating mothers in Jimma town.

4.4. Inclussion and exclussion criteria

4.41. Inclusion criteria

Muslim women who breast feed, who has children less than or equal to two year, available during data collection and willing to participate by taking informed consent.

4.42. Exclusion criteria

Severely ill clients were excluded.

4.5. Sample size and sampling technique/sampling procedure

4.51. Sample size determination

A single population proportion formula was used to estimate the study participants by using the following assumptions.

$$n = \frac{z^2 \, p \, (1-p)}{d^2}$$

n: unadjusted sample size

z: z value obtained from the CI used

p: pre study estimate

d: margin of error

In Africa, including Ethiopia, there was no single published paper on this topic; to the best of researcher knowledge. Therefore 50% was used as proportion.

Therefore, P-Value of **0.5**, was taken.

At 95% CI z=1.96 and d=0.05

So, n = $\underline{(1.96)^2[0.5(1-0.5)]}$ n=384

$$(0.05)^2$$

Since our source population(N) which is **3008,** is less than 10,000, correction formula was done as follows:

Using finite population correction, our sample size was adjusted, as follows

$$nf = \frac{n}{1+n/N}$$

n_f : adjusted sample size

n: unadjusted sample size

N: size of souce population (Total muslim lactating mothers in Jimma town)

$$nf = \frac{384}{1+384/3008}$$

$n_f = 341.$

lastly, by adding 10% non response rate, the final sample size was **375.**

4.52. sampling technique/sampling procedure

The proportional allocations was made based on the number of Muslim lactating mothers attending their child health at each HC.

The formula for proportion is =n/N*nf,

where n is specific source population; where n= specific source population

N= total source population and

nf= final sample size.

Sample size for Higher 2 Health Center = 655/3008*375 = 82

Sample size for mandera kochi health center = 1039/3008*375 = 130

Sample size for Jimma health center = 860/3008*375 = 107

Sample size for Bacho Bore Health center = 454/3008*375 = 56

Therefore a total of 375 sample was selected.

Consecutive sampling technique was used to select study participant from each health center.

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│     Jimma town      │
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│ Public Health centers in the town with their specific     │
│ source population                                         │
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│          │ │HC = 1039 │  │          │  │HC = 454  │
│= 655     │ │          │  │= 860     │  │          │
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│             Specific calculated sample size               │
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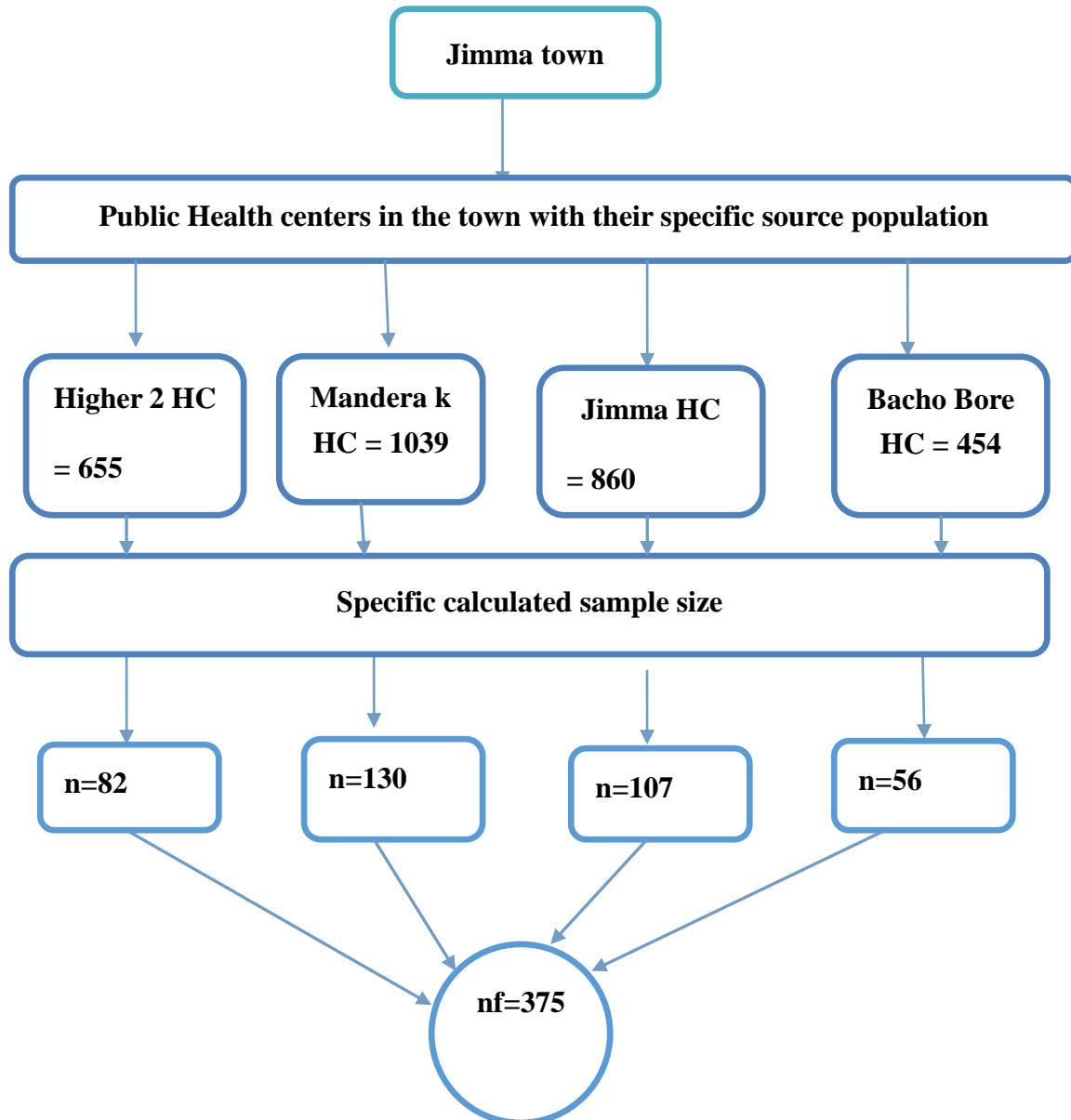
Fig 2: graphical representation of sampling distribution

4.6. Data collection tools and procedures

Structured questionnaire was used to collect the data from study Participants through face-to-face interviews method. The Questionnaire was adapted from related literature and modified based on the objectives of the study and the cultural context of the study

setting. The questionnaire contains five parts; which include socio-demographic status, Knowledge related questions; which is, ten point yes no question on awareness of lactating mothers towards flexibility, recommendation and danger signs, from different litrature [10-12, 23]. Attitude related questions; which is believe of lactating mothers towards breastfeeding during fasting, from study done at ankara, Turkey [24]. Maternal Social support related question; which was measured using the Maternity Social Support Scale (MSSS) developed by Webster and his colleagues. The scale contains six items and includes questions on family support, friendship network, help from spouse, conflict with spouse, feeling controlled by spouse, and feeling unloved by spouse. Each item was measured on a five-point Likert scale and a total score of 30 was possible [53].

Wealth index; was measured by wealth indicators taken from EDHS 2016 and adjusted based on the objective of the study [54]. Data were collected by four nurses and supervised by one health officers. The supervisor assisted and coordinated the data collectors during data collection. Data were collected from selected Muslim lactating mothers, attending EPI and sick child health care at public health center of Jimma town. After orientation on purpose of study and informed consent was taken from study participant, the data collector filled the prepared close ended questionnaire by face to face interview method. Clarification for any difficulty was the duty of the data collectors and supervisors.

4.7.Variables

4.71.Dependent Variable

> **Fasting during Ramadan**

4.72.Independent Variables

- ✓ Socio demographic characteristics like; age of child, Maternal age in years, Number of Para, marital status, education and occupation of mothers and parent, number of family members.

- ✓ Attitude related factors: beliving of mothers on effect of fasting on milk

production and contents, its effect on childs health and her self.

- ✓ Knowledge of lactating mothers towrds; as not to fast is possible, what help lactating mothers if they decide to fast; drinking plenty of water, eating nutritios food b/n iftar and sohoor can help fasting, staying in cool environment and getting enouph rest: when stop fasting, when childs constantly crying and fewer wet diapers of child, mothers feeling very thirsty ands having headache, very little or no urine, feeling disoriented, confused, or faint.

- ✓ Maternal social support like; family support, friendship network, help from spouse, conflict with spouse, feeling controlled by spouse, and feeling unloved by spouse.

4.8. Operational definition

Fasting: Mothers who have history of fasting atleast one day during Ramadan while breast feeding in the last 2 years, were considered as fasting.

Knowledge: The mean value was 6.75. It was used to classify knowlwdge; ≥ 6.75 (good knowledge) and < 6.75 (poor knowledge).

Maternal Social support scale: High social support (for scores 24–30), medium social support (18–23) and low social support (below 18) categories [53].

Wealth index: The level of wealth was ranked on tertile base to, rich, medium and poor.

4.9. Data quality control

The questionnaires was reviewed by advisors for content validity. The pretest was done on 5% of the sample size in shenen gibe hospital, that is not part of study area, and the result was used to modify the tool. Crombach alpha was used to assess internal consistency and coefficient of >=0.7 was used as cut off point. Training was given for data collectors and supervisor by the principal investigator to make them

familiar with the data collection tool.

The collected data were reviewed and checked for consistency, clarity, completeness, and accuracy throughout the data collection process by data collectors and supervisors.

4.10. Data processing and analysis

The collected data were checked for completeness before data entry and incomplete questionnaires were removed from collected data. The collected data were coded before data entry. The pre coded questionnaires were entered in to epi data version 3.1,and exported to SPSS version 20 for analysis. The descriptive statistics like frequency and proportions was used to describe both variables first. Dimentional reduction technique; Principal component analysis was used to calculate the wealth index. The goodness of fit of the model Was assessed by using Hosmer – Lemeshow's statistical test. Its values above 5% indicate that the model has good predictive ability. Bivariate logistic regression was done to identify the association between each independent variable and the outcome variable, that is fasting or not. Variables with p ≤ 0.25 in the bivariate analyses was entered into a multiple logistic regression analysis, to identify independent predictors of fasting. Back ward LR, procedure was used during model development. While, 95% CI and P-Value was used to check the significany of association, the adjusted OR was used to measure the magnitude of association after controlling potential confounders. Those variables having a p-value < 0.05, was considered as significantly associated with the dependent variable..The result was presented using frequency tables and figures.

4.11. Ethical consideration

This study was approved by institutional review board at Jimma University, Institute of Health. Formal letter was written from Jimma university, Institute of Health to Jimma town first, Secondly, the letter of support was written from Jimma town health bureao to each (four) health center. The written letter was taken to each Head of health center and permission to collect data was taken. The study participants were

informed about the study, purpose of the research, expected duration of the interview, and a description that the participants can withdraw from the interview at any time, had no risk and no payment for their recruitment and its purpose in their mother tongue. Secondly, they were given an informed consent before the commencement of each interview, and no personal identification was registered. The confidentiality of the data was ensured. The information obtained was used for the study purpose only.

4.12. Dissemination plan

After the completion of the study, the finding will be submitted to Jimma university SRP office, and Nutrition and dietetics department. The result of the study will be communicated to relevant bodies like religious institution, health care provider specially in my study area. Furthermore, it will be published on reputable journal.

CHAPTER 5: RESULTS

5.1 Socio demographic characteristics of respondents:

A total of 364 lactating mothers were involved in this study, with 97% response rate. From all; Around half 187 (51.4%) of the respondents has the child with age of less than or equal to 6 month. More than half 217 (59.6%) of the mothers were less than or equal to 25 years and 215(59.1%) of them have more than one child. Most 272 (74.7%) of the mother can read and write. Only, 129 (35.44%) of study participants were rich by economic status (**Table 1**).

Table 1: Socio demographic and economic chartacteristics of muslim lactating mothers, in public health centers of Jimma town, Oromia, South west Ethiopia, 2022 (n = 364).

Variables	Category	Frequency	Percent
Age of last child	</= 6 month	187	51.4
	> 6 month	177	48.6
Gestational age at delivery	</= 38 weaks	162	44.5
	> 38 weaks	202	55.5
Maternal age	</= 25 year	217	59.6
	> 25 year	147	40.4
Parity	Single	149	40.9
	Multiple	215	59.1
Marital status	Married	339	93.1
	Divorced	17	4.7
	Widowed	8	2.2
Maternal education	Cant read and write	37	10.2
	can read and write	272	74.7
	University/college	55	15.1

Paternal education	Cant read and write	15	4.1
	can read and write	272	74.7
	University/college	77	21.2
Paternal occupation	Driver	15	4.1
	Employee	95	26.1
	Merchant	157	43.1
	Daily laborer	39	10.7
	Carpenter	27	7.4
	Farmer	22	6.0
	Brokers	4	1.1
	Shoeshiners	5	1.4
Number of family members	from 2 to 4	135	37.1
	from 5 to 7	208	57.1
	greater than 7	21	5.8
Wealth tertile	Poor	116	31.9
	Medium	119	32.7
	Rich	129	35.4

5.2 Knowledge of respondents:

More than half 229 (62.9%) of participants had good knowledge towards fasting in Ramadan. Most 324 (89.0%) of the mothers know that, fasting for lactating mother is not mandatory. Two hundred thirty two (63.7%) and 235 (64.6%) of participants knew as; Drinking plenty of water b/n iftar and sohoor and eating nutritios iftar and sohoor can help during fasting. More than half 251 (69%) and 244 (67%) of participants had knowledge of; every breast feeding women with very little or no urine and women feeling disoriented, confused, or faint shold stop fasting (**Table 2).**

Table 2. Knowledge of lactating mothers towards fasting in Ramadan in Jimma town, Oromia, South west Ethiopia, 2022, (n = 364).

Variables		Frequency	Percent
Not to fast is possible for lactating mothers; in Islamic laws		327	89.8
Drinking plenty of water b/n iftar and sohoor can help fasting		232	63.7
Eating nutritios iftar and sohoor help during fasting		235	64.6
Constantly crying and fewer wet diapers is the sign of baby is not gaining enough milk		233	64.0
Breast feeding mothers feeling very thirsty ands having headache must stop fasting		196	53.8
It is possible to break fasting if self and child health is feared		275	75.5
Staying in cool environment is help fasting mothers		286	78.6
Getting enouph rest is help fasting mothers		203	55.8
Breast feeding women with very little or no urine shold stop fasting		251	69.0
Breast feeding mothers feeling disoriented, confused, or faint should stop fasting		244	67.0
Knowledge category	**Poor knowledge**	135	37.1
	Good knowledge	229	62.9

5.3 Attitude of respondents: Only one hundred thirty two (36.3%) of lactating mothers believe, nursing mothers should fast and most of them 273 (75.0%) were beleaving, Ramadan fasting may adversely affect the health of infants and them self. While 304 (83.5%) of respondents were baleaving, Ramadan fasting decreases breast milk production, 164 (45.1%) of them were beleaving Ramadan fasting can alter composition of breast milk (**Table 3**).

Table 3. Attitudes of muslim lactating mothers, towards fasting during Ramadan at public health centers of Jimma town, Oromia, South west Ethiopia, 2022 (n = 364).

Attitude related factors	Responses	
	Yes (%)	No (%)
Believing, nursing mothers should fast	132	36.3
Believing, Ramadan fasting decreases breast milk production	304	83.5
Believing, Ramadan fasting may adversely affect the health of infant and my self	273	75.0
Believing, Ramadan fasting can alter composition of breast milk	164	45.1

5.4 Maternal social support scale of respondents:
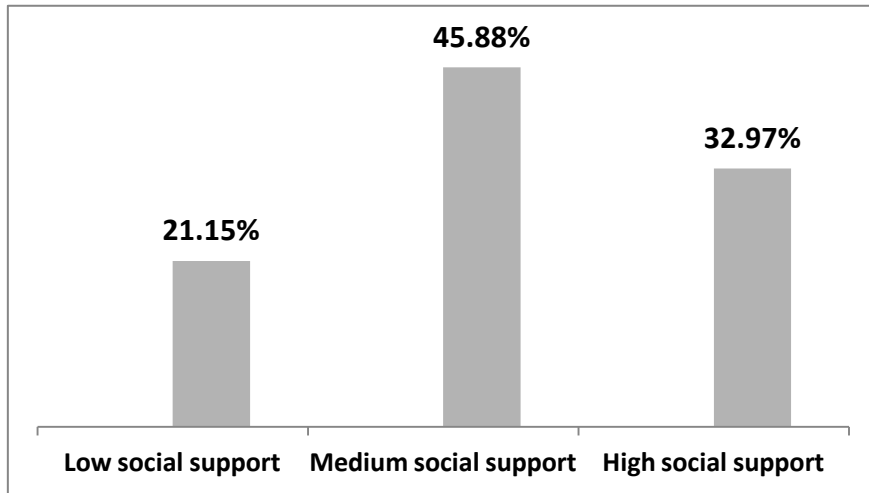
Fig 3. Maternal social support category of Muslim lactating mothers at public health centers of Jimma town, Oromia, South west Ethiopia, 2022, (n = 364).

In this study; 32.97% of respondents have high social support, while 21.15% have low social support **(fig 3).**

5.5 Magnitude of fasting in Ramadan:
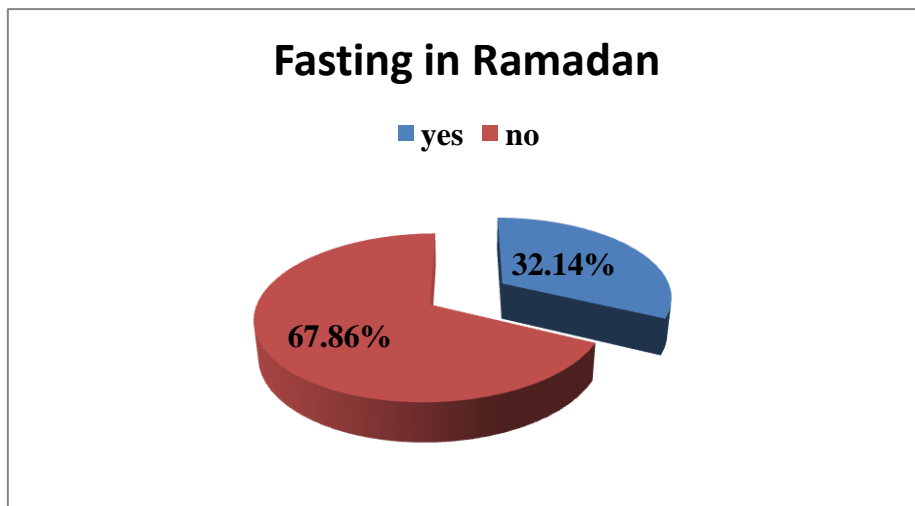
Fig 4: Magnitude of fasting in Ramadan among muslim lactating mothers at public health centers of Jimma town, Oromia, South west Ethiopia, 2022, (n = 364).

In this study, two hundred fourty seven (67.86%) of lactating mothers were fasting during Ramadan **(fig 4).**

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5.6 Factors associated with fasting during Ramadan among muslim lactating mothers.

Binary logistic regression was used; to assess the association between each independent variables and out-come variable. Accordingly, the following variables were candidate (P-value < 0.25) for multi variate logistics regression: maternal age, number of Para, maternal occupation, paternal education, number of family members in the house hold, beleaving, Ramadan fasting decreases breast milk production, beleaving, Ramadan fasting can alter composition of breast milk, knowledge, economic status and maternal social support.

In Multi variable logistic regression model; believing fasting can alter composition of breast milk, maternal social support and knowledge of respondents were the variables significantly associated with fasting during Ramadan.

In this study, mothers, who believe fasting alters composition of breast milk were 41% (AOR: 0.591; 95% CI: 0.371, 0.943) times less likely to fast than their counterpart. Participants, who had low social supports were 51% (AOR: 0.493; 95% CI: 0.248, 0.977) times less likely to fast than those who had high social support. In addition to this; Participants who had medium social support were 62% (AOR: 0.381; 95% CI: 0.218, 0.666) times less likely to fast than those who had high social support. Moreover, mothers who had poor knowledge, were 1.62 (AOR: 1.629; 95% CI: 1.238, 2.687) times more likely to fast than those who had good knowledge **(Table 4).**

**Table 4. Multivariable binary logistic regression analysis to identify factors associated with fasting during Ramadan among muslim lactating mothers at public health centers of Jimma town, Oromia, South west Ethiopia, 2022, (n = 364).**

Variable	Category	Fasting		COR(95%CI)	AOR(%%CI)	P value
		Yes N(%)	No N(%)			

Maternal age	≤ 25 year	138 (63.6)	79 (36.4)	0.609 (0.384, 0.966)	0.752 (0.457, 1.239	0.752
	>25 year	109 (74.1)	38 (25.9)	1	1	
Parity	Single	89 (59.7)	60 (40.3)	1.869 (1.196, 2.919)	0.93 (0.539, 1.607)	0.796
	Multiple	158 (73.5)	57 (26.5)	1		
Maternal occupation	House wife	138 (68)	65 (32)	0.505 (0.182, 1.400)	0.616 (0.202, 1.879)	0.395
	Employee	62 (65.3)	33 (34.7)	0.447 (0.155, 1.295)	0.607 (0.182, 2.027)	0.417
	Merchant	26 (65)	14 (35)	0.442 (0.137, 1.427)	0.501 (0.14, 1.797)	0.289
	Daily laborers	21 (80.8)	5 (19.2)	1	1	
Paternal education	Cant read and write	12 (80)	3 (20)	2.553 (0.665, 9.805)	2.042 (0.468, 8.905)	0.342
	Can read and write	188 (69.1)	84 (30.9)	1.429 (0.845, 2.416)	1.084 (0.603, 1.947)	0.788
	College/university	47 (61)	30 (38.9)	1	1	

Number of family members	2 to 4	76 (56.3)	59 (43.7)	0.303 (0.097, 0.949)	0.388 (0.116, 1.296)	0.124
	5 to 7	154 (74)	54 (26)	0.671 (0.216, 2.082)	0.86 (0.264, 2.804)	0.803
	Above 7	17 (81)	4 (19)	1	1	
Wealth tertile	Poor	87 (75)	29 (25)	1.837 (1.06, 3.186)	1.67 (0.905, 3.082)	0.101
	Medium	80 (67.2)	39 (32.8)	1.256 (0.745, 2.118)	1.116 (0.641, 1.943)	0.698
	Rich	80 (62)	49 (38)	1	1	
Knowledge	Good	147 (64)	82 (36)	1	1	
	Poor	100 (74)	35 (26)	1.594 (1.083, 2.552)	1.629 (1.238, 2.687)	**0.049***
Bel,fasting decrease milk production	No	45 (75)	15 (25)	1		
	Yes	202 (66.4)	102 (33.6)	0.66 (0.351, 1.241)	0.863 (0.434, 1.716	0.675
Bel,fasting alter compoof breast milk	No	147 (73.5)	53 (26.5)	1	1	
	Yes	100 (61)	64 (49)	0.563 (0.361, 0.878)	0.591 (0.371, 0.943)	**0.027**[*]

Maternal social support	Low	52 (67.5)	25 (32.5)	0.547 (0.286, 1.048)	0.493 (0.248, 0.977)	**0.043**[*]
	Medium	100 (59.8)	67 (40.2)	0.393 (0.229, 0.673)	0.381 (0.218, 0.666)	**0.001**[*]
	High	95 (79)	25 (21)	1	1	

[*]P value < 0.05 (statistically significant association); 1, Reference category. Hosmer lemeshow test (P value: 0.60).

CHAPTER 6: DISCUSSION

In this study, the magnitude of fasting during Ramadan among lactating mothers was found to be 67.8%. This study also showed that, Maternal attitude towards effect of fasting on breast milk composition, maternal social support and knowledge were the factors associated with fasting in Ramadan.

The current prevalence of fasting is higher compared to studies done in ayidin,Turkey 50% [28], Ankara, Turkey 52% [24] and Lahore, Pakistan 57% [29]. However, this finding is lower than crossectional study done in Saudi Arabia; in which, 89.9% of breastfeeding mothers were fasting [30]. The discrepancy might be due to the difference in number of para, sample size used, culture or spritual beliefs in the study setting. In addition inclusion of mother with childs age upto two years may be another reason, while most of other studies included only upto one year [24,28].

In the current study; mothers who believe, fasting alter composition of breast milk were less likely to fast than their counterpart. This finding is supported by the study done in najran, Saudi Arabia, in which; the significant number of fasting mothers, believed that fasting does not alter the composition of breast milk [30]. In addition, the association is supported by religious recommendation which revealed; breastfeeding women is exempted from fasting, if they feel themselves or their babies will be harmed by fasting [23]. However, according to studies done on effect of fasting on composition of breast milk; it was significantly affects proteins, carbohydrates and electrolytes in breast milk [42] and on some micronutrients contents of breast milk [25]. So, the finding implied that maternal attitude should be based on scientific knowledge, as having positive attitude towards effect of fasting, should not be a single criteria to decide fasting [7].

The current finding reported, there is positive significant association between maternal social support and fasting status. Mothers, who had low social supports were less likely to fast than those who had high social support. This finding is supported by the study done in singapore, which revealed social support from family and spouse are

the reasons, why lactating mothers used to fast [7]. This may be due to the fact that when she get full support from family and husband, she can get enough rest that helps her to decide fasting with them. In addition to this, social support and guidance from family and friends shows a significant impact on the initiation and continuation of breastfeeding by mothers [33-35].

The current finding revealed; Respondents knowledge towars fasting in Ramadan was significantly associated with fasting. Respondents, who had poor knowledge were more likely to fast than those who had good knowledge. This finding is supported by survey of fasting during pregnancy in singapore, which revealed; Lack of basic religious knowledge regarding Islamic law on fasting were found to be more likely to fast [7]. The possible reason for association may be attributed to; having poor knowledge on possible warning sign and recommendation made lactating women to have positive attitude towards fasting and to decide fasting.

6.1 Strength and limitation of the study

This study had several strength, the design used, cross-sectional is relatively quik, inexpensive and the best way to determine the prevalence and identify factors associated with it. All health centers in the Jimma town was included in the study with large sample size to increase generalizability. Multi-variate binary logistic regression with adjusted odds ratio was used to control for possible confounders. Although the finding of this study are useful for policy, there are some limitations. For example, The design used (cross-sectional) is not indicates casual relation ship. Methods used for data collection (interview) are subjected to social desirability bias. Scarcity of adequate litratures on the topic for discussion. Lack of religious based sampling frame for sampling procedures.

CHAPTER7: CONCLUSSION AND RECOMMENDATION

7.1: Conclussion

The significant number of lactating mothers was fasting in the current study setting. Having, positive attitude on effect of Ramadan fasting on breast milk, having high social support and poor knowledge on recommendation and possible warning sign, by lactating mothers were the factors significantly associated with fasting, in the setting.

7.2: Recommendation

The town health bearou should should facilitate training for health workers and religious leaders on effect of fasting during breastfeeding.

Health professions on maternal and child health care services should consider maternal attitude, social support and their knowledge to deliver effective councelling for lactating mothers on fasting during Ramadan.

Lactating mothers should discuss with health workers before deciding to fast in Ramadan. The family and spouse should give knowledge based support on fasting during breastfeeding.

Religious leaders should give councelling on religious view of fasting during breastfeeding.

Researchers should conduct qualitative study to identify more factors associated with fasting.

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Annex1. Consent form and Information sheet

1.1 Information sheets

Name of the principal investigator: Abdulhamid A/Reshad

Name of study area: Jimma town.

Research budget covered by: principal investigator

Research objective: To assess prevalence of Fasting during Ramadan and associated factors among Muslim lactating mothers, in Jimma town, South west Oromia, Ethiopia, 2021.

Significance of the study: The result of this study will be used us baseline for future studies and it will be used as input for policy makers.

Data collection procedure: The data collectors will interview participants using questionnaire after obtaining written informed consent from the participants. All data are accessible to researchers, supervisors and data collectors. Only research team members will have access to full data of study participants. The data from participants will used for research purpose only.

Risks: There will be no risks to participants.

Beneficial: The study is beneficial for lactating mothers who fast in Ramadan and health professional.

Participants' right: The participants have a right to stop the interview at any time, or to skip any question that he/she does not want to answer.

Incentives: The participants will not be provided any specific incentive for taking part in the research other than acknowledgment.

Confidentialities: The study result will not include participants name and address.

Agreement: Participants are expected to be fully voluntary and give written consent to participate in the study.

Whom to contact: for any queries, anybody can contact: **Abdulhamid A/Reshad**

Phone no. 0917256473

<p style="text-align:center">1.2 Informed Consent</p>

Name of principal investigator: Abdulhamid A/Reshad

Research title: Prevalence of Fasting in Ramadan and associated factors among Muslim lactating mothers at Jimma town, South west Oromia, Ethiopia, 2022.

1. I confirm that I understand the information sheet for the above study and have had the opportunity to ask questions.

2. I understand that my participation is completely voluntary and that I am free to withdraw at any time, without giving any reason, without my medical care or legal rights being affected.

3. I agree to take part in the above study. I would like to confirm my agreement by signing.   Participant's name _____ Signature_____ date_____

Name of the data collector: _____ Signature: _____date_____

Thank you for your participation and cooperation!

Annex 2: Data Collection tools

Part 1: Socio demographic Characteristics of Muslim lactating mothers in Jimma Town,South West Oromia,Ethiopia,2022.

Ser.no	characters	Response
1.	Age of child (in months)	_____
2.	Maternal age in years	_____
3.	Number of Para	1.one 2. >=two
4.	Merital status	1.married 2.divorced 3.widowed 4.single
5.	Maternal Education	1.can't read & write 2.Read & write 3.University/college
6.	Maternal occupation	1.House wife 2.Gov't employee 3.Merchant 4.Daily laborer
7.	Paternal education	1.can't read & write

			2.Read & write
			3.University/college
8.	Paternal occupation		1.Driver
			2.Gov't employee
			3.Merchant
			4.Daily laborer
			5.others…
9	Number of family members in the household.		1.2-4
			2.4-6
			3.>/=6
10	Did you fast in Ramadan		1.yes
			2.no

Part 2:Knowledge of Muslim lactating mothers towards fasting in Ramadan in Jimma Town,South West Oromia,Ethiopia,2022

n.	Variables	Response
1.	Is it possible, not to fast for lactating mothers; in Islamic laws?	1.yes 2.No
2.	Does drinking plenty of water b/n iftar and sohoor can help fasting?	1.yes 2.No
3.	Does Eating nutritios iftar and sohoor help during fasting?	1.yes 2.No

4.	Do constantly crying and fewer wet diapers is the sign of your baby is not gaining enough milk?	1.yes 2.No
5.	Does feeling very thirsty, dizzy ands having headache is the sign of your body is dehydrated?	1.yes 2.no
6.	Is it possible to break fasting if you fear for self and your child health?	1.yes 2.no
7.	Do, Staying in cool environment is help fasting mothers?	1.yes 2.no
8.	Do, Getting enouph rest is help fasting mothers?	1.yes 2.no
9.	Do, Breast feeding women with very little or no urine shold stop fasting?	1.yes 2.no
10.	Do, Breast feeding mothers feeling disoriented, confused, or faint should stop fasting?	1.yes 2.no

Part3:Attitude of lactating mothers towards fasting in Ramadan

n.	Attitude related factors	Response
1.	Do you Believe that nursing mothers should fast?	1.yes 2.No
2.	Do you Believe that; Ramadan fasting decreases breast milk production?	1.yes 2.No

3.	Do you Believe that; Ramadan fasting may adversely affect the health of infant/and mothers?	1.yes 2.No
4.	Do you Believe that Ramadan fasting alter composition of breast milk?	1.yes 2.No

Part 4. wealth index

Ser	Variables	Responses
1	Does your household have their own electricity?	1. Yes 2. No
2	Does your household have a Radio?	1. Yes 2. No
3	Does your household have a Televission?	1. Yes 2. No
4	Does your household have a Refrigerator?	1. Yes 2. No
5	Does your household have an electric mitad?	1. Yes 2. No
6	Does your household have a table?	1. Yes 2. No
7	Does your household have a chair?	1. Yes 2. No

8	Does your household have a bed with cotton/sponge/spring mattress?	1. Yes
		2. No
9	Does any member of your household have a bank account?	1. Yes
		2. No
10	Does this house hold has there own pipe water?	1. Yes
		2. No
11	Does this house hold has there own home?	1. Yes
		2. No
12	Does this house hold has electric stove?	1. Yes
		2. No
13	Does this house hold has there own motor ctcle?	1. Yes
		2. No
14	Does this house hold has biffe?	1. Yes
		2. No
15	Does any member of this house hold has mobile phone?	1. Yes
		2. No

Part 5. Maternal social support scale

Variables	Always	Most of the time	Some of the time	Rarely	Never
I feel loved by my husband/partner					
My husban/partner helps me a lot					

My family is always there for me					
I have good friends who support me					
There is conflict with my husband/partner					
I feel controlled by my husband/partner					

Annex 3. Foormii odeeffannoo fi eyyama qooda fudhattootaa

3.1 Foormii odeeffannoo

Maqaa abbaa qorannichaa : Abdulhamid A/Reshad

Bakka qorannichaa: magaalaa Jimma.

Qaama Baasii qorannichaa haguugu: Abbaa qorannichaa

Kaayyoo qorannichaa: Baayyina namaata ramadaana soommaniif wantoota wal qabatan ,haadholii muslimoota harma hoosisan magaalaa jimmaa.

Barbaachisummaa qorannichaa:Bu'aan qorannoo kanaa qorannoo fuulduraatiif ka'umsa taha.

Akkaataa ragaan itti funaanamu: Ragaa funaanaan eeyyama himaanna eega fudhateen booda gaaafii afaniitiin raga funaana.Qaama qorannoon walitti dhufan qofatu ragaawwan funaanaman kana arguu dandahu. Ragaan funaanamu kon bu'aa qorannoo qofaaf oola.

Soda :qooda fudhataarra sodaan adda hin jiru

Qaama qorannichaan fayyadamu: haadholii hoosisaaniifi ogeessa fayyaa.

Mirga qooda fudhataa:Hirmaataan yeyoo kamiyyuu mirga gaafiif deebii dhaabuufi gaafiiwwan deebisuu hin barbaanne irra cehuu qaba.

Faayidaa addaa: Qooda fudhataadhaaf faayidaan addaa woyii hin kennamu.

Eegumsa hirmaataa: qorannichi maqaaf ganda hirmaattotaa hin barbaadu.

Walii galtee: Hirmannan qooda fudhattota guutuma guutuutti fedhiidhaan.

Qaama quunamuu qaban:Rakkoo quunnamuu kamiifuu qaamni kamuu kan quunnamu danda'u.: **Abdulhamid A/Reshad**

Lakk mob. 0917256473

3.2.Foormii Eeyyama qooda fudhattootaa

Maqaa abbaa qorannoo: Abdulhamid A/Reshad

Mata duree qorannichaa: Prevalence of Fasting in Ramadan and associated factors among Muslim lactating mothers, in Jimma town, South west Oromia, Ethiopia, 2022.

2.1 Odeeffannoo olitti naa kenname hubadhee carraa waan naa galuu dide gaafachuu qabachuu koo nan mirkaneessa.

2.2 Hirmaachuuu kookun fedhii kootin tahuu isaa ibsee yeroon barbaadetti dhiisee bahuu akkan dandahu hubadheen jira;sababa tokko malee,raga yaalaa tokkoon alatti.

2.3 Qoranno armaan olii keessatti qooda fudhachuukoo waadaa nan gala.mallattoo kootiin walii galteekoo nan mirkaneessa.

Maqaa qooda fudhataa_____ mallatto_____ guyyaa_____

Maqaa nama raga guuraaruu: _____ mallattoo:

_____guyyaa_____

 Hirmaachuu keessaniif galatoomaa.

Annex 4. Meeshaa ragaan funaanamu (Afaan oromootti Hiikame)

Kutaa 1. Gaaffii waayee haadholii hoosiftuudhaan wol qabatan buufataalee fayyaa magaalaa jimma, kibba baha itoophiyaa

Lakk.	Amaloota	Deebii
1.	Umurii daaimaa (Ji'aan)	_____
2.	Umrii haadhaa woggaan	_____
3.	Lakkofsa da'umsaa	1.tokkoffaa 2.Lamaafi isaa oli
4.	Haala fuudhaaf heerumaa	1.kan heerumte 2.kan hiikte 3.kan irra due
5.	Haala barumsa Haadhaa	1.kan hin baranne 2.barresuuf dubbisuu 3.Yuniversity/colleji kan eebbifamt
6.	Hojii Haadhaa	1.Haadha worraa 2.Hojjattuu mootummaa 3.Daldalaa 4.Hojjettuu guyyaa 5.Kan biraa…
7.	Sadarkaa barumsa abba worraa	1. kan hin baranne

		2.barresuuf dubbisuu
		3.Yuniversity/colleji kan eebbifamt
8.	Hojii abbaa worraa	1. Hojjataa mootummaa
		2. Qonnaan bulaa
		3. Daldalaa
		4. Hojjettuu guyyaa
		5. Kan biraa…
9.	Lakkofsa maatii	1.2-4
		2.4-6
		3.>/=6
10.	Ramadaana soomteettaa?	1.yes
		2.no

Kutaa 2. Gaaffilee beekumsa haadholiin hoosiftuun sooma Ramadaanaa irratti qaban buufataalee fayyaa magaalaa jimma, kibba baha itoophiyaa

Lakk	Gaaffiiwwan	Deebii
1	Haati hoosiftu sooma nyaachuu ni dandeessi, akka amantii islaamaati	1.eeyyee
		2.lakkii
2	Sooma hiikanii qabuun duratti bishaan gahaa dhuguun ni gargaara	1.eeyyee
		2.lakkii
3	Yeroo sooma qabaniifi hiikan nyaata madaalamaa nyaachuun ni gargaara	1.eeyyee
		2.lakkii
4	Daaimni baayyee booyuuniifi uffanni ishee jiidhuu dhabuun	1.eeyyee

	mallatto aannan gahaa argachuu dhabuu isheeti	2.lakkii
5	Haati harma hoosiftu kan baayyee dhoobottee mataan dhukkubu sooma nyaachuu qabdi	1.eeyyee
		2.lakkii
6	Yoo fayyaa ofiitiifi kan daaima tiif sodaatte sooma cabsuu dandeesi	1.eeyyee
		2.lakkii
7	Iddoo qabbanaa turuun haadha soomtu ni gargaara	1.eeyyee
		2.lakkii
8	Boqonnaa gahaa argachuun haadha soomtu ni gargaara	1.eeyyee
		2.lakkii
9	Haati hoosiftu yoo fincaan ishee baayyee xiqqaate sooma cabsuu qabdi	1.eeyyee
		2.lakkii
10	Haati hoosiftu yoo of wollaalte ykn kufte sooma cabsuu qabdi	1.eeyyee
		2.lakkii

Kutaa 3. Gaaffilee ilaalcha haadholiin hoosiftuun sooma Ramadaanaa irratti qaban buufataalee fayyaa magaalaa jimma, kibba baha itoophiyaa

Lakk	Safartuu	Deebii
1	Haadholiin hoosiftuun soomuu qabu jettee amantaa?	1.eeyyee
		2.lakkii
2	Ramadaana soomuun harma ni xiqqeessa jettee amantaa?	1.eeyyee
		2.lakkii

3	Ramadaana soomuun fayyaa koo/daa'imaa miidha jettee amantaa?	1.eeyyee
		2.lakkii
4	Ramadaana soomuun qabiyyee harmaa ni jijjiira jettee amantaa?	1.eeyyee
		2.lakkii

Kutaa 4. Gaaffilee sadarkaa qabeenya haadholii hoosiftuun wol qaban buufataalee fayyaa magaalaa jimma, kibba baha itoophiyaa

Lakk	Safartuu	Deebii
1	Manni keessan ibsaa kan ofii qabaa?	1.eeyyee
		2.lakkii
2	Raadiyoo qabduu?	1.eeyyee
		2.lakkii
3	Televizionii qabduu?	1.eeyyee
		2.lakkii
4	Firiijii qabduu?	1.eeyyee
		2.lakkii
5	Eelee humna ibsaatiin hojjatu qabduu?	1.eeyyee
		2.lakkii
6	Xarapheeza qabduu	1.eeyyee
		2.lakkii
7	Minjaala qabduu?	1.eeyyee

		2.lakkii
8	Algaa firaash qabu qabduu?	1.eeyyee
		2.lakkii
9	Lakkofsa herregaa baankii qabduu?	1.eeyyee
		2.lakkii
10	Bishaan boombaa qabduu?	1.eeyyee
		2.lakkii
11	Mana dhuunfaa keessanii qabduu?	1.eeyyee
		2.lakkii
12	Stoovii qabduu?	1.eeyyee
		2.lakkii
13	Mootor saayikilii qabduu?	1.eeyyee
		2.lakkii
14	Biiffee qabduu?	1.eeyyee
		2.lakkii
15	Silkii harkaa qabduu?	1.eeyyee
		2.lakkii

Kutaa 5. Gaafilee gargaarsa haadholii hoosiftuun wol qabatan

Tokko tokkoon gaaffii kana irratti deebii na ibsa jettu filachuun sadarkaa gargaarsa siif godhamuu ibsita.

1. **Yeroo hunda**

2. **Yeroo baayyee**

3. **Yeroo tokko tokko**

4. **Yeroo muraasa**

5. **Gonkuma**

Lakk	Safartuu	Deebii
1	Abbaan worraa koo na jaallata	
2	Abbaan worraa koo baayyee na gargaara	
3	Maatiin koo yeroo hundaa na woliin jiru	
4	Hiriyyaa gaarii kan na gargaaru qaba	
5	Abbaa worraa koo woliin wolitti buiinsi jira	
6	Abbaa worraa kootiin eegamaa tahuu koon yaada	

Annex 5. Table contains bi-variate analysis results

A bivariate analysis using binary logistic regression to identify factors associated with fasting during Ramadan among muslim lactating mothers at public health centers of Jimma town, Oromia, South west Ethiopia, 2022, (n = 364).

Variable	Category	COR(95%CI)	P value
Maternal age	≤ 25 year	0.609 (0.384, 0.966)	**0.035***
	>25 year	1	
Parity	Single	1.869 (1.196, 2.919)	**0.006***
	Multiple	1	
Maternal occupation	House wife	0.505 (0.182, 1.400)	**0.189**
	Employee	0.447 (0.155, 1.295)	**0.138***
	Merchant	0.442 (0.137, 1.427)	**0.172***
	Daily laborers	1	
Paternal education	Cant read and write	2.553 (0.665, 9.805)	**0.172***
	Can read and write	1.429 (0.845, 2.416)	**0.183***
	College/university	1	
Number of family members	2 to 4	0.303 (0.097, 0.949)	**0.04***
	5 to 7	0.671 (0.216, 2.082)	0.490
	Above 7	1	
Wealth tertile	Poor	1.837 (1.06, 3.186)	**0.03***

	Medium	1.256 (0.745, 2.118)	0.392
	Rich	1	
Knowledge	Good	1	
	Poor	1.594 (1.083, 2.552)	**0.052***
Bel,fasting decrease milk production	No	1	
	Yes	0.66 (0.351, 1.241)	**0.197***
Bel,fasting alter compoof breast milk	No	1	
	Yes	0.563 (0.361, 0.878)	**0.011***
Maternal social support	Low	0.547 (0.286, 1.048)	**0.069***
	Medium	0.393 (0.229, 0.673)	**0.001***
	High	1	

P< 0.25 (candidate for multi variate binary logistic regression).

Annex 6. Table contains Hosmer and lameshow test results

Step	Chi-square	df	Sig.
1	2.954	8	.937
2	3.700	8	.883
3	4.834	8	.775
4	4.236	8	.835
5	5.785	8	.671
6	3.986	8	.858

| 7 | 6.424 | 8 | .600 |