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Research Article

Knowledge, Attitude and Practices of Expressing Breastmilk to Achieve Exclusive Breastfeeding Among Working Mothers in Kiambu County, Kenya

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Abstract

The Kenyan constitution entitles mothers to a three-month maternity leave, meaning that a Kenyan mother has a deficit of 3 months to achieve this recommendation. Expressing breastmilk is essential for Kenyan working mothers to achieve the recommended duration of exclusive breastfeeding (6 months). The study aimed to analyze the characteristics and practices of working mothers expressing breastmilk with an aim of achieving exclusive breastfeeding up to 6 months. This study adopted a cross sectional study design. The study involved 203 working mothers with infants below six months, solicited from four hospitals in Kiambu County, Kenya. A researcher administered semi-structured questionnaire was used to collect socio-demographic, knowledge and practice data. A five point Likert scale was used to collect data on the attitudes of the working mothers towards expressing breastmilk. The data was analyzed using the Statistical Package for Social Sciences. More than half (59.4%) of the mothers had not received information on expressing breastmilk. Mothers expressed a positive attitude that breastmilk could be expressed by hand, stored breastmilk was ideal for feeding infants and storing breastmilk correctly could aid in achieving exclusive breastfeeding up to 6 months. A minority of the participants (36.9%) had expressed breastmilk. Mothers who had knowledge on expressing were 8 times more likely to express breastmilk ([OR]: 8.224; CI 4.307-15.703; $p<0.001$). This demonstrated that knowledge levels on expressing had a significant association with the practice of expressing breastmilk. Therefore, dissemination of knowledge on expressing needs to be boosted, with an aim of improving expressing and breastfeeding outcomes.

Keywords

Working Mother, Expressed Breastmilk, Expressing, Exclusive Breastfeeding, Breastmilk, Knowledge, Attitude

1. Introduction

Exclusive breastfeeding (EBF) involves an infant only receiving milk which could be direct from the breast of a mother or a wet nurse, or expressed with the exemption of hospital fluids such as oral rehydration salts and multivitamins [1]. The World Health Organization (WHO) recommends breastmilk as the only feed that an infant should consume for the first six months of life because the child's digestive system is not mature enough to digest and assimilate other feeds [2]. Children

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who have been breastfed exclusively for the first 6 months of life have good nutritional outcomes [3] reduced morbidity rates and good development [4]. The Ministry of Health aims at a yearly increase of 3% in EBF rates [5]. Despite this, the rates of EBF have remained fairly stagnant for the last 8 years according to Kenya Demographic Health Survey (KDHS) 2014 (61%) and KDHS 2022 (61.4%) in 2022 [6].

Women in Kenya are given to have a three calendar months' maternity leave. The Breastfeeding Mother's Bill states that every mother has a right to freely breastfeed or give expressed breastmilk to her baby. The objective of this bill is to encourage EBF among working mothers after resuming work from leave, by enabling them to express breastmilk. The bill also mandates the employers to establish lactation rooms that are equipped with storage facilities such as refrigerators for the safe expression and storage of milk [7].

Maternity leave has a negative impact on the duration of EBF [8]. Decreased duration of EBF increases the probability of children getting infections that require hospitalization [9] and contributes to 11.6% of childhood mortality of babies who are under 5 years old [10]. The infants born by working women may miss out on a well-balanced, readily available feed if no measures are put in place to ensure continuity of EBF after they go back to work.

Expressing is an approach to infant feeding which involves a woman pumping breastmilk, which the infant consumes from a feeding bottle or cup. Expressing breastmilk is a way of maintaining EBF when the mother and child are apart for various reasons such as work. If well stored, expressed breastmilk (EBM) provides the same nutritional and immunological properties as milk suckled directly from the breast [11]. Expression of breast milk is necessary for successful completion of EBF especially for working mothers. [12].

In Kenya, only 61% of children 0-6 months old are exclusively breastfed, among them only 47.3% of working mothers in Kiambu County achieve EBF, which could be worsened by the growing trend of women's participation in the market place [13]. A study done in the country observed that most mothers start weaning their infants at two months in preparation to their return to work [14].

A study conducted in Naivasha established that the prevalence of EBF among working mothers at 14 weeks was 36% lower than non-employed mothers. Most mothers initiated complimentary feeding before returning to work to ensure that their babies adapted to various feeds. The mothers cited that the major challenges to EBF were low knowledge levels and experience of milk expression, poor workplace support and distance from the child [15].

2. Materials and Methods

2.1. Study Design and Population

A cross sectional study design was utilized for this study, 203 mothers participated in the study. They were recruited from four hospitals located in Kiambu County. Cluster random sampling was used to identify the hospitals. The 15 sub-counties within Kiambu County were randomly sampled to get four. One level five hospital was randomly sampled from each of the four sub-counties (clusters). A researcher administered semi-structured questionnaire consisting of open-ended and close-ended questions was administered to collect data on socio-demographic, knowledge, attitude and practices of expressing breastmilk.

2.2. Location of the Study

The study was conducted in Kiambu County, Kenya. Kiambu County is located in the central part of Kenya, bordering Nairobi County to the south, Murang'a to the north, Machakos County to the east, Nyandarua to the northwest, and Nakuru on the western side. The county comprises 15 sub counties. The county has a geographical area of 2,449.2 km^2 and a population of 2.41 million, of whom 1.23 million are female. Kiambu has 796,241 households, and each household has an average size of three people and boasts of a population density of 952 people/km [16].

The main economic activities in Kiambu County are businesses, agriculture, and governmental institutions, which offer employment to it constituents as well as goods and services to its population. The population of the county comprises employees in Nairobi County's private and government organizations, which is the capital city of the country.

2.3. Target Population

The target population was working mothers of infants aged 6 months and below and were willing to participate in the study. Working mothers included those in formal and informal employment, as well as those in the agricultural and business sectors.

2.4. Data Collection Instruments

The researcher administered a semi-structured questionnaire comprising of both closed-ended and open-ended questions. These questions were asked to the mothers and the data collection assistants recorded their responses in the questionnaire. The researcher administered semi-structured questionnaire was used to gather information on socio-demographic characteristics, maternal knowledge and attitude on expressing breastmilk as well as the practice of expressing breastmilk.

2.5. Validity and Reliability

These research instruments were adapted from the WHO knowledge, attitude and practice questionnaires and from a study conducted in Kenya [17]. Guidance from Kenyatta University, Department of Foods, Nutrition and Dietetics was sought, which ensured that the research tools were ethical and protected participants' rights.

In terms of reliability, the research assistants were trained to ensure compliance to standard procedures when collecting information. The test re-retest method was used to ensure that the questionnaires and interview guides were consistent in obtaining similar results. The same research assistant gave the questionnaires twice to each participant, three days apart. Cronbach's alpha was utilized to establish the correlation of the two results, yielding a coefficient of 0.86, which was considered acceptable [18].

2.6. Pre-testing

A pre-test study was conducted on twenty-two working mothers at a hospital offering the same level of care offered in the hospitals in the study. The participants selected had similar characteristics to those of the mothers in the study. The purpose of piloting was to validate and standardize the research instruments and the study procedures to be utilized in the study. All the research assistants enlisted for this study participated in the pre-test exercise. They collected data as an opportunity to apply the skills learnt during training. The pilot study was conducted for a duration of one month. After the interviews were completed, mothers' feedback on how the meeting could be improved was solicited to inform updates to the questionnaires. During piloting, the questionnaire was tested for validity, consistency, clarity, relevance, comprehensibility, soundness and sensitivity during the pilot study.

2.7. Recruitment and Interview Procedure

Identification of participants using the eligibility criteria, signing of informed consent forms and admission into the study were conducted between January and February 2024. The participants were recruited from four hospitals in Kiambu County offering level five type of care. The eligibility criteria included; having a maternity leave of 3 months or less, residing within Kiambu County and a mother to a singleton infant. Data was collected between March and September 2024.

2.8. Data Analysis

The data was analyzed using the Statistical Package for Social Sciences. Descriptive statistics were used to generate information on socio-demographic characteristics, and expression practices. Concerning knowledge scores, 1 point was awarded for a correct answer and no point (0) for an incorrect answer. Attitude levels were evaluated on a 5-point Likert scale consisting of strongly agree at (5 points), agree (4 points), neither agree or disagree (3 points), disagree (2 points) and strongly disagree (1 point). Chi square and odds ratio were used to determine the association between variables.

2.9. Ethical Considerations

Authority to carry out this study was sought from Kenyatta University Graduate School. Ethical clearance was obtained from Kenyatta University Ethics Review Committee. Permission to conduct the study was obtained from the National Commission for Science, Technology, and Innovation, Kiambu County Government, as well as the health facilities in which the study was conducted.

3. Results

3.1. Socio Demographic Characteristics of the Working Mothers

The overall mean age of the mothers in years was 27.16±4.81 (Table 1). The majority (80.3%) of the mothers were married. In terms of birth number, about a third (39.9%) of the mothers had one child, while 39.4%, 15.8% and 4.9% had two, three, and four children and above respectively. More than two-thirds of the mothers (71.5%) had a tertiary education, in which 67.0% had college/university education and 3.4% had a postgraduate degree. About half (51.2%) of the mothers were in the informal sector, while 41.4% were formally employed and 7.4% were in business.

Table 1. *Socio-demographic and economic characteristics of the working mothers.*

Indicator	Category	N (%)
Maternal age (mean±SD)		27.54±4.93
Marital status	Married	163 (80.3)
	Single	34 (16.7)
	Separated/divorced	6 (3.0)
Number of children	1	81 (39.9)
	2	80 (39.4)
	3	32 (15.8)
	≥4	10 (4.9)

Indicator	Category	N (%)
Maternal level of education	Postgraduate degree	7 (3.4)
	College/university	136 (67.0)
	Secondary (A level)	57 (28.1)
	Primary	3 (1.5)
Maternal occupation	Formal employment	84 (41.4)
	Informal employment	104 (51.2)
	Business	15 (7.4)
Duration of maternity leave	2 months	4 (2.0)
	3 months	199 (98.0)

3.2. Knowledge Levels of the Working Mothers Towards Expressed Breastmilk

More than half (59.6%) of the mothers had not received any kind of information on expressing breastmilk (Table 2). Of those who had received information, almost three-quarters (73.2%) had gotten it from the media, 62.2% from health care workers (62.2%), 35.4% family members and 31.7% from friends. Out of these, 98.8% knew that they could use hands and or pump to express breastmilk. About a third of the mothers (37.8%) expressed that there would be a difference in breastmilk volume when expressing by either hand or pump. About three-quarters (75.6%) reported that there would be no difference in contamination when expressing by hand or pump and expressed breastmilk is nutritious (93.9%). In terms of nutritional value of expressed and direct breastmilk, more than half (62.2%) expressed that they were equally nutritious. In terms of hygiene, the majority of the mothers knew that it is important to wash hands (93.9%) and to clean the breast (92.7%) before expressing. More than half (56.1%) of mothers knew that workplace policies existed to support lactating mothers to be able to express breastmilk. About three quarters of the mothers knew that breastmilk could be stored at room temperature (76.8%), fridge (86.6%) and freezer (85.4%). Majority (79.8%) knew that breastmilk expressed at the workplace could be stored in the fridge, freezer or cooler box while and 20.7% did not know where EBM could be stored. Out of those working mothers who had received information on expressing breastmilk, 76.6% of them had satisfactory knowledge levels on expressing and storing breastmilk.

Table 2. Knowledge aspects of the working mothers towards expressed breastmilk.

Aspect of knowledge	Response	N (%)	Score
Knowledge of expressing breastmilk	Yes	82 (40.4)	
	No	121 (59.2)	
Source of information on expressing breastmilk	Hospital/health worker	51 (62.2)	
	Friend	26 (31.7)	
	Family/relative	29 (35.4)	
	Media	60 (73.2)	
What to use to express breastmilk	Hand/pump/both	81 (98.8)	1
	Not sure	1 (0.2)	0
Difference in milk volume when expressing by hand or pump	Yes	31 (37.8)	0
	No	51 (62.2)	1
Difference in milk contamination when expressing by hand or pump	Yes	20 (24.4)	0
	No	62 (75.6)	1

Aspect of knowledge	Response	N (%)	Score
Expressed breastmilk is nutritious for the baby	Yes	77 (93.9)	1
	No	5 (6.1)	0
The more nutritious breastmilk between direct and expressed	None is more than the other	51 (62.2)	1
	Breastmilk	31 (37.8)	0
Handwashing is important before expressing	Yes	77 (93.9)	1
	No	5 (6.1)	0
Cleaning the breast before expressing is important	Yes	76 (92.7)	1
	No	6 (7.3)	0
Workplace policies exist to support expressing breastmilk	Yes	46 (56.1)	1
	No	36 (43.9)	
Breastmilk stored at room temperature is ideal for the baby to take	Yes	63 (76.8)	1
	No	19 (23.2)	0
Ideal duration of storage at room temperature	8 hours or less	60 (95.2)	1
	More than 8 hours	3 (4.8)	0
Refrigerated breastmilk is ideal for the baby to take	Yes	71 (86.6)	1
	No	11 (13.4)	0
Ideal duration of storage at the refrigerator	≤72 hours	23 (32.4)	1
Frozen breastmilk is ideal for the baby to take	Yes	70 (85.4)	1
	No	12 (14.6)	0
Ideal duration of storage at the freezer	Up to 9 months	35 (50.0)	1
	< 6 months	35 (50.0)	0
Place of storage of expressed breastmilk at the workplace	Fridge/cooler box/freezer	65 (79.8)	1
	Don't know	17 (20.7)	0

3.3. Attitude of the Working Mothers Towards Expressing Breastmilk

Attitude levels were measured using a Likert scale with one (1) being strongly disagree and five (5) being strongly agree. Mean scores were calculated per statement (Table 3). Mothers expressed a positive attitude that breastmilk could be expressed by hand, stored breastmilk was ideal for feeding infants and storing breastmilk correctly could aid in achieving EBF up to 6 month. Majority of the mothers felt that expressing was tiresome, expressing resulted into lower levels of breastmilk than a baby suckling directly from the breast. Generally, the attitude scores of the majority of the mothers was above average at 35.78 out of 50.

Table 3. *Attitude of the working mothers towards expressing breastmilk.*

Aspect of attitude	Mean score ±SD
Breastmilk expression is painful	3.56±1.239
Breastmilk expression is tiresome	4.08±0.972
Expressed breastmilk has a lower yield than direct milk	4.02±0.645
Breastmilk can be expressed at the workplace	3.18±0.837

Aspect of attitude	Mean score ±SD
Breastmilk expression can be done by hand	4.08±0.438
Storing breastmilk correctly can aid in achieving EBF up to 6 months.	3.55±0.940
Stored breastmilk is safe for infants.	3.95±0.475
Stored breastmilk has the same nutritional value as direct breastmilk	3.30±1.042
It is safe to freeze breastmilk for months	3.06±1.281
It is safe to keep breastmilk at room temperature for 8 hours	3.00±1.169
Cumulative score	35.78 out of 50
Aggregate Mean	3.578±0.445

*SD-standard deviation

3.4. The Practice of Expressing Breastmilk

Only about two thirds (36.9%) of the mothers were expressing breastmilk, with an equal measure of them using both hand and pump (46.7%, 45.3% respectively). The most preferred place of expressing was at home, with majority of the mothers (70.7%) having a refrigerator at home to store breastmilk (Table 4). Few mothers (36.0%) had lactation centres in their places of work with refrigeration equipment. Almost half of the mothers preferred storing milk in special breastmilk bags (40.0%) as opposed to baby bottles (30.7%) and plastic containers (29.3%). Of those who expressed at the workplace, majority of them (70.5%) transported the milk using a cooler box.

Table 4. *The practices of expressing breastmilk among working mothers.*

Aspect of practice	Response	N (%)
Expressed breastmilk	Yes	75 (36.9)
	No	128 (63.1)
Method used to express breastmilk	Hand	35 (46.7)
	Pump	34 (45.3)
	Both hand and pump	6 (8.0)
Place of expressing	Home	31 (41.3)
	Work	20 (26.7)
	Both home and work	24 (32.0)
Storage of EBM	Fridge	27 (36.0)
	Room temperature	20 (26.7)
	Room temperature, fridge, freezer	28 (37.3)
Presence of a working fridge at home	Yes	53 (70.7)
	No	22 (29.3)
Presence of a working fridge at the workplace to store breastmilk	Yes	27 (36.0)
	No	48 (64.0)
Items used to store breastmilk	Baby bottle	23 (30.7)
	Plastic containers	22 (29.3)
	Special breastmilk bags	30 (40.0)
Transportation of EBM from workplace to	Cooler box	31 (70.5)

Aspect of practice	Response	N (%)
the house	Hand bag	13 (29.5)

3.5. Association Between Knowledge on Expressing Breastmilk and Practice of Expressing Breastmilk

Working mothers who knew that expressed breastmilk stored at room temperature was ideal for the baby to consume were three times more likely to express breastmilk for their children ([OR]: 3.588; CI 1.254-10.265; p=0.012) than those who did not express (Table 5). Those who knew that expressed breastmilk stored at the fridge was safe for the baby to consume were six times more likely to express ([OR]: 6.512; CI 0.789-53.710; p=0.050). Similarly, those who knew that expressed breastmilk stored at the freezer was safe for the baby to consume were about more likely to express breastmilk ([OR]: 1.622; CI 0.521-5.045; p=0.034).

Table 5. Association between knowledge and the practice of expressing breastmilk.

Variable	Prevalence of expressing breastmilk				
	Odds ratio	95% CI		Chi square	P value
		Lower	Upper		
Received information on expressing	8.224	4.307	15.703	45.273	<0.001*
Expressed breastmilk is nutritious for the baby	2.286	0.243	21.470	0.550	0.458
Handwashing is important before expressing	0.810	0.127	5.148	0.050	0.823
Expressed breastmilk stored at room temperature is ideal for the baby to consume	3.588	1.254	10.265	6.255	0.012*
Expressed breastmilk stored in the fridge is ideal for the baby to consume	6.512	0.789	53.710	3.837	0.050*
Expressed breastmilk stored in the freezer is ideal for the baby to consume	1.622	0.521	5.045	4.494	0.034*
Received information on expressing	8.224	4.307	15.703	45.273	<0.001*
Expressed breastmilk is nutritious for the baby	2.286	0.243	21.470	0.550	0.458
Handwashing is important before expressing	0.810	0.127	5.148	0.050	0.823
Expressed breastmilk stored at room temperature is ideal for the baby to consume	3.588	1.254	10.265	6.255	0.012*
Expressed breastmilk stored in the fridge is ideal for the baby to consume	6.512	0.789	53.710	3.837	0.050*
Expressed breastmilk stored in the freezer is ideal for the baby to consume	1.622	0.521	5.045	4.494	0.034*

3.6. Association Between Attitude on Expressing Breastmilk and Practice of Expressing Breastmilk

The association between maternal attitude towards expressing breastmilk and the prevalence of expressing breastmilk was determined using chi square tests. The belief that expressing breastmilk was tiresome (χ^2=27.898), expressing breastmilk had a lower yield that breastmilk fed directly from the breast (χ^2=15.661) and breastmilk could be expressed by hand (χ^2=24.456) had an association with the practice of expressing breastmilk. The belief that storing breastmilk correctly can aid in achieving EBF up to 6 months (χ^2=24.602) and stored

breastmilk had the same nutritional value than direct breastmilk from the breast had an association with the prevalence of expressing (χ^2=43.207) at p≤0.005.

Table 6. Association between attitude and practice of expressing breastmilk.

Aspect of attitude	Prevalence of expressing breastmilk		
	χ^2 value	df	P value
Breastmilk expression is painful	8.615	4	0.071
Breastmilk expression is tiresome	27.898	4	<0.001*
Expressed breastmilk has a lower yield than direct milk	15.661	4	0.004*
Breastmilk can be expressed at the workplace	24.456	4	<0.001*
Breastmilk expression can be done by hand	10.620	4	0.031*
Storing breastmilk correctly can aid in achieving EBF up to 6 months.	24.602	4	<0.001*
Stored breastmilk is safe for infants.	6.547	3	0.088
Stored breastmilk has the same nutritional value as direct breastmilk	43.207	4	<0.001*
It is safe to freeze breastmilk for months	8.101	4	0.088
It is safe to keep breastmilk at room temperature for 8 hours	6.477	4	0.166

*df means degrees of freedom

4. Discussion

4.1. Knowledge on Expressing Breastmilk

The government of Kenya, through the Ministry of Health has been scaling up exclusive breastfeeding through BFHI, BFCI and IYCF initiatives. In addition, promotion of EBF is a major intervention in the Kenya National Nutrition Action Plan. Currently, counselling of mothers and/ or caregivers on Infant and Young Child Feeding (IYCF) practices is carried out in government health facilities. The counselling is mostly done in the morning before commencement of the services of growth monitoring and immunization of children. Community Health Volunteers have also been tasked with counselling on IYCF, under the "Community Health Strategy". Other community-based initiatives include the Baby Friendly Community Initiative and Mother-to-Mother Support groups [19].

More than half of the women had not received information on expressing breastmilk. A study conducted in the coastal region of Kenya acknowledged that increased knowledge of mothers and caregivers on the art of expressing, safe storage and feeding of EBM could help mothers attain the six months target. The study observed low levels of knowledge and attitude towards EBM [14]. Similarly, another study observed that working women had low knowledge levels on the usage of EBM and were afraid of contamination. They refrained from expressing and using expressed EBM [20].

In this study, media was a major source of information. This shows that advancement in technology has had a weighty impact on knowledge of expressing breastmilk. Similar findings were established in a study conducted in Malaysia [21] in which the most common source of expressing knowledge was social media (85.6%), followed by health care staff (48.5%). However, these findings were a contrast of those made in a study conducted in rural Kenya [22] involving both employed and unemployed mothers. The main source of information was health care providers and media only accounted for 5.2% of information sources. Similar findings to these were obtained from a study in Zambia that involved working mothers, in which the main source of information was health care staff (64.4%) [23].

Of those who had received information on expressing breastmilk, a majority of them had satisfactory knowledge on expressing and storing breastmilk. These results were a contrast of those reported (34%) in a similar study conducted in Nairobi County [24]. The difference in results could be attributed to the BFCI, BFHI and IYCF initiatives of both the county and national government to boost EBF levels in the country. An almost similar proportion (79.3%) of working mothers in Uganda were knowledgeable about the practice of expressing breastmilk [25]. In contrast, a study conducted in Nigeria on the determinants of expressed breastmilk among working mothers found that only 4.1% of the working mothers in the study had good knowledge on EBM [26].

Breastmilk can be expressed using hand or pump which can

be either mechanical or electrical. The EBM maybe kept for eight hours at room temperature or stored inside the refrigerator to prolong its shelf life [27]. Majority of the working mothers in the study knew that hand and pump could be used to express breastmilk and that EBM kept at room temperature for eight hours was safe for the infants to consume.

About half of the mothers in the study were aware of workplace policies supporting expressing breastmilk. Similar findings were reported in a study in which almost two thirds of participants were aware that there was an employment act in place that had directed employers to set up fully equipped lactation stations at their workplaces [24].

4.2. Attitude Towards Expressing Breastmilk

In general, the levels of attitude on expressing breastmilk were good (mean of 3.578±0.445 out of 5) with 71.56% of mothers having a positive attitude towards expressing breastmilk. Similarly, a study in Malaysia [21] found that a majority of the mothers had a positive attitude towards expressing. Findings from a study conducted in Ethiopia on the knowledge and attitude towards expressed breastmilk acknowledged that expression of breastmilk allows working women to achieve EBF up to six months. This ensures that infants of the working women receive similar nutrition care with those of stay at home mothers [28].

There were gaps in the attitude that expressing breastmilk was painful, tiresome and that breastmilk could be expressed at the workplace. These findings were consistent with those of a study conducted in Kenya as the working mothers in the study believed that expressing was painful, tiresome, and it produced a much lower yield than a baby suckling directly from the breast did [24]. Mothers in a study conducted in Ethiopia had a negative attitude towards expressing. They believed that expressing is painful, tedious and unyielding and that EBM has a lower nutritional value than milk suckled directly from the breast [29].

The working mothers had a positive attitude towards the belief that stored breastmilk was safe for infants. A study done among mothers in India had contrasted the findings by observing that storing expressed breastmilk was not possible [30]. However, there was a gap in the belief that it was safe to freeze breastmilk for months, stored breastmilk had the same nutritional value as direct breastmilk and that it was safe to keep breastmilk at room temperature for 8 hours. These findings were consistent with those of a similar study conducted in Nairobi Kenya [24].

Based on a study done in Kenya on knowledge and attitudes towards giving expressed breastmilk in coastal Kenya, first time mothers and their advisers had a negative attitude towards expressing breastmilk [14]. Mothers who participated in a study on the predictors of EBF practice among lactating women did not feel confident in their ability to express and store breastmilk effectively; hence believing that expressing and safe storage of breastmilk was not possible [31].

4.3. Practice of Expressing Breastmilk

Expression of breast milk is a useful strategy in ensuring successful completion of EBF unto 6 months [12] and hand expression is recommended as the initial method of breast milk expression, followed by the use of a breast pump [32]. Despite this, a minority of the working mothers in this study had expressed breastmilk.

Of those that expressed breastmilk, almost half (46.7%) expressed by hand, 45.3% by pump and a minority (8.0%) used both hand and pump. Availability of storage facilities to store breastmilk influences a mothers' decision to express [33]. A higher percentage of the mothers in the current study preferred expressing at home and had a fridge at home to store the breastmilk (70.7%). Only a few mothers (36.0%) had a privilege of having a fridge at the work place, which may have affected their ability to express at work. A study in Indonesia [34] reported that the rate of EBF at 6 months was remarkably higher amongst working women who had lactation spaces to express breastmilk (OR = 2.62) compared to those who lacked this privilege. A study conducted among Dutch women expressed that EBF was more dominant among those whose workplaces provided them with the flexibility to express, and had laid down policies supporting breastfeeding [35].

Unavailability of breastfeeding breaks at work, inadequate facilities to pump or store milk and lack of day care centres near the work place compound on the ability to maintain expressing breastmilk, which in turn affects EBF [36]. Majority of those who expressed at the work place preferred to carry EBM in a cooler box. It is recommended that expressed breastmilk be stored in a container either in the fridge or in a cool box if it will not be consumed within eight hours [37].

4.4. Impact of Knowledge on Expressing Breastmilk on the Prevalence of Expressing Breastmilk

In Kenya, lack of knowledge and experience with expressing and storing breastmilk may be challenging the prevalence of milk expression [11]. The current study observed a significant association between those who received information on EBM and the practice of expressing. Knowledge levels were low and so were the expression rates. Similarly, a study conducted among working mothers who participated in an employee sponsored lactation program had very good knowledge levels on expressing breastmilk. They had access to a lactation consultant and attended classes on the benefits on breastfeeding. Majority (78.9%) of them knew how to pump and most of them (98%) had a successful experience expressing breastmilk [38].

4.5. Impact of Maternal Attitude on Expressing Breastmilk on the Prevalence of Expressing Breastmilk

Maternal attitudes that expressing was tiresome, it could

be done by hand and even at the workplace, and expressing resulted into a lower yield than breastfeeding directly had a significant association with expressing. The beliefs that properly stored breastmilk could help achieve EBF up to 6 months and expressed milk was as nutritious as direct milk were also associated with the practice of expressing. Similar findings were deduced from a study conducted in New York, USA on how mothers perceived and practiced human expression, in which mothers had a positive attitude towards expressing. They believed that EBF was not possible without pumping breastmilk. They also felt that pumping was tedious, time consuming and it was an inconvenient task. Babies were more efficient in emptying breasts than pumps [39]. In contrast, a study conducted in India found that attitude had no significant relationship with the practice of expressing breastmilk [40].

5. Conclusions

There were substantial gaps in the dissemination of information on expressing breastmilk as less than half of the sample population had not received any information on expressing breastmilk. This was shown to affect the prevalence of expressing breastmilk. Maternal attitude also had an impact on practice levels of expressing. There is need to offer specialized education in terms of counselling tailored to the needs of working mothers, such as demonstration of expressing and safe storage of expressed breastmilk. This will ensure that more working mothers are informed and confident enough to express breastmilk, in a bid to ensure attainment of EBF up to 6 months even after they resume work. Social media has become a key source of information. Stakeholders could also explore social media as an avenue for communication on expressing breastmilk.

Abbreviations

BFCI	Baby-friendly Community Initiative
BFHI	Baby-friendly Hospital Initiative
KDHS	Kenya Demographic and Health Survey
EBF	Exclusive Breastfeeding
EBM	Expressed Breastmilk
IYCF	Infant and Young Child Feeding
UNICEF	United Nations International Children's Emergency
WHO	World Health Organization

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Author Contributions

Esther Watetu Wainaina: Conceptualization, Formal analysis, Investigation, Methodology, Project administration, Software, Writing – original draft

Peter Maina Chege: Supervision, Writing – review & editing

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Data Availability Statement

The data supporting the outcome of this research work has been reported in this manuscript.

Conflicts of Interest

The authors declare no conflicts of interest.

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Biography

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Research Field

Esther Watetu Wainaina: maternal and child nutrition, breastfeeding

Peter Maina Chege: malnutrition, maternal and child nutrition, agri-nutrition, food security, micronutrients

Regina Wangui Kamuhu: clinical nutrition, maternal and child nutrition, non-communicable diseases, Dyslipidemia, food safety, malnutrition.