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Research Article

Maternal Factors, Feeding Practices and Morbidity Status of Children Aged 0-6 Months Attending Kwanza Hospital's Well-Baby Clinic

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Abstract

Good nutrition in early life is key to building the body's immunity and good health in later years. For children aged 0-6 months, exclusive breastfeeding (EBF) is widely advocated as the optimum practice. In Kenya, exclusive breastfeeding rates are still low. The purpose of this study was to determine the maternal factors, feeding practices and morbidity among children aged 0 to 6 months attending well baby clinic at Kwanza Hospital, Trans-Nzoia, Kenya. A cross-sectional analytical design was utilized and systematic sampling used to attain the sample size of 151 children. Questionnaires, focus group discussion and key informant guides were employed in data collection. SPSS version 28 was used for data analysis. To evaluate the results, descriptive statistics, chi-square test, ODDs ratio and logistic regression were employed. Majority (63.5%) of the children were aged 0-3 months. More than half (52%) of the children were on EBF, over a quarter (26.2%) were given prelacteal feeds and nearly half (41.2%) reported sick. The findings revealed associations between mode of delivery with breastfeeding status (p-value 0.0001), marital status with breastfeeding frequency (OR 5.23, 95% CI 1.90-14.36, p-value 0.001), maternal illness with use of prelacteal feeds and morbidity with monthly income. Logistic regression was conducted using the Maximum Likelihood Estimation method (MLE). There was a significant relationship between monthly income and the likelihood of a child being sick (p=0.036). The relationship was a weak positive relationship (r=0.063, r^2=0.004). The study concludes that feeding practices among children aged 0-6 months were inadequate (use of prelacteals, mixed feeding and replacement feeding) in relation to World Health Organization standards. Nearly half (41.2%) of the children (0-6 months) suffered from childhood morbidities. This study suggests strengthening of exclusive breastfeeding health talks by health institutions, strengthening preventive strategies to reduce childhood illnesses, counseling and support for mothers having children before marriage.

Keywords

Maternal Factors, Feeding Practices, Morbidity, Prelacteal Feeds, Exclusive Breastfeeding

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1. Introduction

Optimal nutrition in early childhood promotes long-term health [1]. On the other hand, inadequate feeding practices are responsible for 11.6% of child mortalities globally [2]. This is a setback to Sustainable Development Goal (SDG) 3 that aims at reducing morbidities and ending preventable deaths [3]. Optimal feeding upholds SDG 3 [4] and also aligns with the Breast Milk Substitute Regulations Act (2012). This act seeks to uphold breast milk amongst other feeds. For children aged 0 to 6 months, to provide the best possible growth, World Health Organization (WHO) promotes exclusive breastfeeding [5]. Exclusive breastfeeding (EBF) practice is key to upscaling universal health care as one of the pillars of the "big four" agenda in Kenya [6]. Breast milk is characterized by immunological properties [7] that prevent infectious and chronic diseases [8]. This enhances the lives of millions of children and prevents under five deaths annually [9].

Child morbidity is a global problem with under-fives bearing the brunt, where 75% of deaths occur within the first year, as a result of childhood morbidities [10]. The common childhood morbidities in developing countries include respiratory diseases, diarrhea, pneumonia, fever and malaria contributing to approximately 760,000 morbidities yearly [11, 10]. In Africa, diarrheal diseases are highly prevalent among the under-fives causing up to 330,000 deaths yearly [12] and also high prevalence of fever and malaria [13]. In Kenya, like other developing countries, childhood morbidities remain to be a challenge where every child under the age of five experiences diarrhea in a year [14] while malaria contributes up to 20% of child deaths in the country [15]. In Nairobi informal settlements, 16.6% of children born of younger mothers had diarrhea and a similar proportion (16.3%) observed among older mothers [16]. At the Coast, majority (70%) of hospitalized Malaria was among children aged 6 months to 4 years [17]. In Trans-Nzoia County, 17.8% of under-five children presented with fever [18]. Most studies have looked at health-seeking behaviour and prevalence of a particular disease among the overall under-five population with less focus on other co-morbidities that can be present in the 0 to 6 months' age group.

Worldwide, EBF is at 43.5%, 16.6% mixed feeding (MF), and 9.4% exclusive replacement feeding (ERF) [19]. Between 2000 and 2018, Sub-Saharan Africa had a 34% prevalence of [20]. In Kenya, EBF lies at 60% [18] with varying data from different parts of the country. In Naivasha, mothers who work exhibited a low prevalence of EBF [21]. In Meru County, 13% of children aged 0 to 6 months were introduced to liquids other than breast milk, 10% were on predominant breastfeeding and 27% cumulative EBF in mother to mother support groups having education and income generating activities [22]. In Nyando district, based on 24-hour recall, continuous EBF was higher (44%) among parents who underwent couple counselling and lower (33%) in maternal counselling [23]. In Kiambu level 4 hospital, a study done among HIV exposed infants revealed EBF rate of 71.4%, 10.4% exclusive replacement feeding and 18.2% mixed feeding [24].

In Trans-Nzoia County, there is limited data on EBF trends. The suboptimal practices have tremendous effect to the child's health including increased morbidity and mortality [25, 26] Attributes 11.6% of under-five deaths to sub-optimal breastfeeding practices. Other effects include stunting and increased infections especially where hygiene is not observed [25]. Since it is expected that children aged 0 to 6 months are exclusively breastfed, numerous studies have focused on feeding practices among older children (6-59 months) with little information available on children aged 0-6 months. Furthermore, there's lack of evidence of previous literature on the prevalence of EBF in KSCH, Trans-Nzoia. Mothers' self-efficacy can influence feeding practices [27] where sub-optimal practices are attributed to a variety of maternal and child-related issues [28]. Mother's work status and marital status are related to child fever disease. Children from separated and single mothers are highly associated with fever disease as opposed to those who are married [29]. Consequently, high rates of breastfeeding are largely reported among those who are married hence influencing the morbidity rates since breast milk is known to have immunological properties [8]. This study focused on maternal awareness, maternal illnesses, breastfeeding complications, place and mode of delivery amongst mothers of children aged 0 to 6 months attending well baby clinic (WBC) at Kwanza Sub-County Hospital (KSCH). The study also aimed to ascertain the morbidity status and feeding practices of the study children.

2. Materials and Methods

2.1. Research Design and Study Variables

An analytical cross-sectional design was used to determine maternal factors, feeding practices and morbidity among children aged 0 to 6 months in KSCH, Kenya. This design allows data from a group of participants to be gathered once in time, allowing for the measurement of associations and establishing relationships between various components within a defined population. The design was preferred to provide description of the variables and establish relationships between maternal factors, feeding practices and morbidity. The study involved three independent and two dependent variables. The independent variables were maternal factors, demographic characteristics of children aged 0 to 6 months, socio-economic and socio-demographic characteristics of caregivers. The dependent variables were feeding practices and morbidity among children aged 0 to 6 months. This enabled the researcher to understand how an independent variable impacts a variety of diverse dependent variables and allowed numerous study questions.

2.2. Study Area and Study Population

The research was carried out at KSCH, Kwanza constituency, Trans-Nzoia County. Kwanza Sub County has a population of 4172 children aged 0-11 months, 2089 males and 2083 females [30]. It has food poverty estimate of 28.1% of its population. The percentage distribution of household consumption patterns includes 82.1% (purchase/stock),11.3% (own production) and 6.6% (gifts) [31]. Kwanza Sub-County has approximately 25,376 hectares of agricultural land where 26,223 of the population practice crop production and 18,991 practice livestock production, maize being the leading crop production. Kwanza ward was selected for the study since it has the highest population (approximately 55,647) after Kapomboi ward [30]. Children aged 0 to 6 months old who visited WBC at Kwanza Hospital, Trans Nzoia County from 1/9/2023 to 29/9/2023 were the target population for this study. Their caregivers participated in the study as respondents to determine the maternal factors, feeding practices and morbidity among the children. This age group (0 to 6 months) is the one commonly affected by the researcher's variables including different feeding practices such as mixed feeding and exclusive replacement feeding. Caregivers and children aged 0 to 6 months who were ill or admitted at the time of study, and those who were unwilling to be part of the study were excluded.

2.3. Sample Size Determination

Fisher's formula [32] was utilized to determine the sample size. EBF being the most common indicator among other feeding practices for children aged 0 to 6 months, a national EBF prevalence rate of 60% [18] was used.

$$n = \frac{Z2pq}{e2}$$

When the population exceeds 10,000, n=the sample size
Z = the standard deviation at 95% confidence level (1.96)
p = the estimated rate of child feeding practices on the target population

$$n = \frac{(1.96)(1.96)(0.60)(0.40)}{(0.05)(0.05)} = 369$$

Fisher et al., (1998) formula was used for populations under 10,000:

$$nf = n/1+ (n/N)$$

Where; nf = the sample when the population is less than 10,000. n= sample, when the total population exceeds 10,000. N= Estimated monthly population of 0 to 6 months' children attending WBC [32]

$$nf = 369/1+369/220 = 138$$

The sample size was raised by 10%, making a total of 151 to cater for those who did not respond.

2.4. Sampling Techniques

Kwanza Sub County Hospital was purposively selected for the study. Being a public facility, and the only level 4 facility in the entire Kwanza Sub-County, it is accessible by a wider population as it offers a wide range of services at an affordable cost. Caregivers and their children (0 to 6 months) attending WBC at KSCH from 1st September 2023 to 29th September 2023 and willing to be part of the study were included. According to the hospital's 2022 records, the estimated number of 0 to 6 months' children attending well baby clinic was 220 in a month. Systematic sampling was used to select the subjects to ensure that each subject had an equal chance of being selected. The monthly attendance (220) was divided by the sample size (151) to obtain an interval of 1.5 that resulted to an approximate of 2 children. A random starting point was selected by choosing either 1 or 2 on a piece of paper to arrive at the one which was to be the first study subject every day. Every 2nd caregiver-child pair was then selected until the sample size (151) was achieved.

2.5. Research Instruments and Pretesting of the Instruments

A structured questionnaire was used to gather information on maternal factors, feeding practices and morbidity among children aged 0-6 months. Section 1 contained information on child's demographics and feeding practices, section 2 had data on maternal factors while section 3 contained data on child morbidity status. Information on socio-demographic characteristics of the caregiver was contained in section 4 while section 5 had information on socio-economic characteristics of the caregiver. Two focus group discussions (FGD) were conducted separately to enable collection of information on foods given to children aged 0-6 months, breastfeed initiation and maternal factors hindering EBF. Each FGD comprised of 10 participants where one included health care workers (HCWs) while the other comprised of caregivers of children aged 0- 6 months. The HCWs and caregivers were purposely selected across different departments and different villages respectively. Key informant interview (KI) was used to collect information on maternal awareness on feeding practices, maternal illness and problems encountered while breastfeeding. 8 individuals were interviewed. They were purposely selected based on area of expertise to include community based health care workers (community health promoters, public health officer, community health assistant). Research tools were pre-tested in Kapsara Sub-County Hospital to assess clarity of the instruments, approximate time taken to administer the tools and taking note of confusing, sensitive and annoying items to the respondents. The facility was chosen since it has comparable characteristics to one

included in the main study. The features considered were availability of a well-baby clinic and being a level 4 hospital with similar settings to the study hospital. 10% of the study sample size (an approximate of 15 caregiver-child pair) was used for the pre-test study. The results guided the researcher on additional information to be included, subtractions, corrections and modification of the tools to achieve the intended objectives of the actual study.

2.6. Reliability and Validity of Data Collection Instruments

The consistency of an instrument in yielding stable results on repeated trials defines its reliability [33]. The same set of respondents were administered an identical questionnaire after an interval of five days, and a comparison was done between the answers that were provided on both occasions. According to [34], the Cronbach's alpha method was adopted to determine the correlation coefficient. The questionnaire was deemed sufficient after a reliability coefficient of 0.78 was obtained. An instrument's validity depends on its capacity to measure the things it was designed to assess in terms of content, criteria and construct [35]. For content validity, care was taken to make sure that all items under investigations were catered for. This was made possible through consultation from Kenyatta University experts and feedback consideration. To determine construct validity, the instruments were subjected to Kenyatta university specialists in food and nutrition to check for clarity of items on maternal factors, feeding practices and morbidity. The tools were updated with the comments. The instruments were assessed by Kenyatta university ethical review committee to ensure proper language use and protection of human rights.

2.7. Training of Research Assistants

Four research assistants comprising of two females and two males, with bachelor's degree qualification in Food, nutrition and dietetics were recruited. They were trained by the principal researcher for three days as guided by the training program. They were introduced to the purpose and objectives of the study. Key areas emphasized included sample population, geographical location, methodology, use of instruments, ethical issues, role plays and safekeeping of completed questionnaires. The research assistants read through the questionnaire and agreed on a standard manner of asking respondents in Kiswahili or local language. This helped in achieving quality data and minimizing variations in data collection procedures

2.8. Data Collection Procedure

Data was collected from 1st September 2023 to 29th September 2023. Questionnaires, KI and FGD were employed to obtain data on various variables. After the caregivers signed the consent form, the principle researcher and the assistants administered the questionnaire. The questionnaires were completed in the Child Welfare Clinic as the mothers waited to be seen. Each day, the accuracy and completeness of the data was verified. KI interviews were conducted on 27th September 2023 at the facility hall, where 8 individuals were interviewed. Information on maternal awareness of feeding practices and maternal illness was collected. The researcher interviewed while one of the assistants noted down and recorded the responses. Two FGDs were conducted on two separate clinic days on 28th and 29th September 2023 at the facility hall. The participants were made aware of the study, and with their approved consent, invited to participate. They sat round the table where the researcher facilitated the discussion while one of the research assistants noted the responses and recorded the session. Non-verbal communication was observed, paying key attention to ensure that each participant had an equal chance to give his or her views.

2.9. Data Analysis

Data was verified, cleaned and coded. Version 28 of the Statistical Package for Social Sciences (SPSS) was used for data entry and analysis. Descriptive statistics such as percentages and frequencies were computed for feeding practices, maternal factors, morbidity, demographic, and socioeconomic factors. The variables' associations were found using the chi-square test. At 95% confidence level, binary logistic regression was done to determine predictors of morbidities and other factors. Tables and graphs were used to present descriptive statistics. Qualitative information was categorized into themes and utilized to complement quantitative information.

2.10. Ethical Considerations

Kenyatta University Graduate School granted permission to carry out the study while ethical clearance was granted by Kenyatta University Ethics Review Committee (Ref No: KU/ERC/APPROVAL/VOL.1). The National Commission for Science, Technology, and Innovation (NACOSTI) permitted to carry out the study (Ref No: 510336). Additionally, permission was requested from the management of the KSCH. Before distributing questionnaires, written consent was sought from the respondents who were made aware of the goals of the research and guaranteed the privacy of any information disclosed. The respondents were voluntarily allowed to be part of the research and those unwilling to participate were not discriminated in any way.

3. Results

3.1. Socio-demographic and Socio-economic Characteristics of the Study Population

More than two thirds (63.5%) of the study children were

aged 0-3 months while over a third (36.5%) were aged 4-5 months (Table 1). More than half (56.1%) were male with female close to half (43.9%). Majority (95.9%) of the children were non-twins and a small number (4.1%) were twins. Regarding socio-demographics of the caregivers, nearly a third (29.7%) were aged 25-29 years and 20-24 years (29.1%). Nearly a quarter (23.6%) of the caregivers was aged 15-19 years while a small number (17.6%) were 30 years of age and above. Majority (73.6%) of the caregivers were married and over a quarter (26.4%) was single. More than half (56.1%) had achieved secondary education, and nearly a quarter (23.6%) had achieved primary education. Minority (17.6%) had tertiary education and a small number (2.7%) had no education at all. Majority (97.3%) of the caregivers were Christians while Muslims were a minority (2.7%) (Table 1). More than two thirds (64.2%) of the main household income earner were fathers, nearly a quarter (22.3%) was mothers and

a small number (12.8%) were grandparents. Over a third of the caregivers were unemployed (43.3%), nearly a third (29.7%) were self-employed and employed (27.0%). Close to half (47.5%) of the caregivers were engaged in mixed farming, more than a third (30.3%) in subsistence farming, minority (14.8%) and a small number (3.3%) practised livestock farming and other farming types respectively. Over a third (40.5%) of the caregivers' monthly income from all sources was less than Ksh. 2,000, a quarter (25.0%) had income between Ksh. 2,000 –Ksh. 5,000, nearly a quarter (21.6%) earned Ksh. 5,001-Ksh. 10,000 and a small number earned over Ksh. 10,000 in a month. With regard to the main sources of food, over half (58.1%) had food from their own farms, over a third (40.5%) of the caregivers bought their food while a small number (1.4%) got their food from other sources including food coupons and donations as indicated on Table 1.

Table 1. Socio-demographic and socio-economic characteristics of the study population.

Variable	N=148	N	%
Child age (months)	0 – 3	94	63.5
	4 – 5	54	36.5
Child's gender	Male	83	56.1
	Female	65	43.9
Child's birth order	1-3	122	82.4
	4-7	26	17.6
Birth characteristics	Non-twin	142	95.9
	Twin	6	4.1
Care-givers age (years)	15-19	35	23.6
	20-24	43	29.1
	25-29	44	29.7
	>/=30	26	17.6
Marital Status	Married	109	73.6
	Single	39	26.4
Highest education level	No education	4	2.7
	Primary	35	23.6
	Secondary	83	56.1
	Tertiary	26	17.6
Religion	Christian	144	97.3
	Muslim	4	2.7
Main income earner	Father	95	64.2
	Father & Mother	1	0.7
	Mother	33	22.3
	Grandparent	19	12.8

Variable	N=148	N	%
Working	Employed	40	27.0
	Not employed	64	43.3
	Self-employed	44	29.7
Farming types (N=122)	Subsistence farming	37	30.3
	Cash crop farming	18	14.8
	Mixed farming	58	47.5
	Livestock farming	4	3.3
	*Other	5	4.1
Income per month	<Ksh 2,000	60	40.5
	Ksh 2,000 – 5,000	37	25.0
	Kshs50001-10,000	32	21.6
	>Ksh 10,000	19	12.9
Main sources of food	Buying	60	40.5
	Own farm	86	58.1
	*Other	2	1.4

*Other farming types included; aquaculture and Co-op farms

*Other sources of food included; donations, food coupons

3.2. Feeding Practices of Children Aged 0-6 Months

3.2.1. Child Breastfeeding Practices

Figure 1. Child breastfeeding practices.

Majority (94.6%) of the children aged 0-6 months were still breastfeeding while a small number (5.4%) were not breast-feeding (Figure 1). More than two thirds (61.9%) of the children were initiated into breastfeeding immediately after birth, nearly a quarter (20.1%) had breastfeeding initiated after more than an hour and a minority (17.9%) were initiated between thirty minutes and one hour. A small number (0.6%) of chil-dren were never initiated to breastfeeding. This was supported by FGD qualitative data that as much as most children were still breastfeeding, a few never get to breastfeed at all." *Some of the young mothers we attend to never want to initiate breastfeeding as they may want to go back to school once they are stable," (participant3 FGD 2 2023).* With regards to breastfeeding time, majority (90.8%) of the children were breastfed on demand while a small number (9.2%) had scheduled time to breastfeed as illustrated by figure 1.

3.2.2. Use of Prelacteals and Introduction of Other Feeds

Over a quarter (26.2%) of the children aged 0-6 months were given other fluids before breastfeed initiation (Table 2). Over half (51%) were given sugar/glucose water, nearly half (42%) were given plain water and a small number (7%) were given infant formula. For reasons as to why prelacteal feeds were used, over half (56.4%) of the mothers said they had no milk, nearly a third (28.2%) had a crying baby and a small number (7.7%) were advised by a health worker and tradi-tional believes (7.7%) (Table 2). Maternal instability after delivery and delays on initiation of breastfeeding also con-tributed to use of prelacteal feeds*," When I got my baby, I had so many complications and felt so weak. I don't remember exactly what was given to my baby but I was told that he was on glucose water. I breastfed the baby after two days when I was somehow stable," (participant2 FGD 1 2023).* Close to

half (48%) of the children were offered other foods and fluids besides breastfeeding within the last 24 hours. More than two thirds (62%) of the children had other foods or fluids introduced at 13-16 weeks, nearly quarter (22.5%) at 0-4 weeks and a small number (11.3%) were introduced at 9-12 weeks and 5-8 weeks (4.2%). With regards to why the foods and fluids were introduced, over a third (30.6%) had a hungry/thirsty child and nearly a quarter (24%) gave reasons of working mothers. Minority among the mothers had reasons including an old enough baby (15.8%), individual preference

(12.2%), family/traditional advice (8%), other reasons (5.2%), sick child (2.2%) and mother's illness (2%) as indicated on table 2. Results from the qualitative data further gave reasons that the mother didn't have enough milk, the baby wasn't satisfied with breast milk or got advice from grandmothers and other family members, "*I had to introduce porridge at 3 months because I didn't have enough milk and the baby was crying a lot. My mother told me that the baby was not getting enough,*" (participant2 FGD1 2023).

Table 2. Use of prelacteals and introduction of other feeds.

Variable	N		n	%
Introduction of other fluids before breastfeeding	148		39	26.2
Types of prelacteal feeds used	39	Infant formula	3	7.0
		Sugar/Glucose water	20	51.0
		Plain water	16	42.0
Reasons for use of prelacteal feeds	39	Baby crying	11	28.2
		Mother had no milk	22	56.4
		Advised by health worker	3	7.7
		Traditional believes	3	7.7
Other foods/fluids given within the last 24 hours	148		71	48.0
When other foods/ fluids were introduced	71	0-4 weeks	16	22.5
		5-8 weeks	3	4.2
		9-12 weeks	8	11.3
		13-16 weeks	44	62.0
Reasons for introduction of other foods/fluids	71	A thirsty/hungry child	22	30.6
		individual preference	9	12.2
		A sick child	2	2.2
		Baby old enough	11	15.8
		Family/traditional advice	6	8.0
		Mother's illness	1	2.0
		Working mother	16	24.0
		*Other	4	5.2

*Other reasons included; School going mothers and baby rejecting breastfeeds

3.3. Maternal Factors

3.3.1. Maternal Factors Associated with Breastfeeding of Children Aged 0-6 Months

A majority (73.6%) of the caregivers was married and had

caesarean delivery (95.0%) (Table 3). Majority (91.4%) of the mothers delivered at the hospital while minority (6.4%) was at home and in motion (2.2%). A small number (19.3%) of mothers were sick in the previous 2 weeks. Minority (17.1%) encountered problems while breastfeeding where more than half (52.2%) had insufficient breast milk, nearly quarter (21.8%) had breast discomfort and a small number

(13%) reported the baby rejecting breast milk. Further information on problems encountered by breastfeeding mothers were breast complications such as engorgement, sore nipple, inverted nipple and cracked nipples," *I had a mother who had full breasts but she was unable to attach the baby in the first three days. After consultation, she was assisted and the problem was resolved,*" *(participant2 KI 2023*. A significant number (p-value 0.0001, 95%) of children whose mothers had undergone vaginal delivery were breastfeeding. Similarly, a significant number (p-value 0.0001, 73.6%) of children whose mothers were married were breastfeeding. No associations were found between place of delivery, maternal illness and child breastfeeding status. No associations were found between mode of delivery, place of delivery and breastfeed initiation (Table 3)

Table 3. Maternal factors associated with breastfeeding of children aged 0-6 months.

Maternal factors associated with current breastfeeding status						
	Is the child currently b/feeding? N=148		Total	%	X^2 (df)	p-value
Variable	Yes	No				
Marital status (N=148)						
Married	108	1	109	73.6	16.294(1)	0.0001*
Single	32	7	39	26.4		
Mode of delivery (N=140)						
Vaginal	130	3	133	95.0	17.037(1)	0.0001*
Cesarean	4	3	7	5.0		
Place of delivery (N=140)						
Hospital	120	8	128	91.4	1.321(1)	0.516
Home	9	0	9	6.4		
While moving	3	0	3	2.2		
Maternal illness (N=140)						
Yes	15	12	27	19.3	2.803(1)	0.094
B/F Problems (N=140)						
Yes	23	1	24	17.1	0.086(1)	0.769
B/F Problems encountered (N=23)						
Insufficient b/ milk	12	0	12	52.2	4.352(1)	0.500
Baby rejects breast	3	0	3	13.0		
Breast discomfort	5	0	5	21.8		
Breast issues (sore nipple, cracked nipple, engorgement)	3	0	3	13.0		

*Significant at p<0.05

3.3.2. Maternal Factors Associated with Breastfeeding Frequency and Use of Prelacteals

Marital status was significantly associated with frequency of breastfeeding (OR 5.23, 95% CI 1.90-14.36, p-value 0.001). Maternal illness in the past two weeks was significantly associated with use of prelacteal feeds (OR 6.41, 95% CI 1.98-20.73, p-value 0.002) as indicated on table 4.

Table 4. Maternal factors associated with breastfeeding frequency and use of prelacteals.

Breastfeeding frequency				
Variable	**OR**	**95% CI**		**p-value**
Marital status		Lower	Upper	
Married	5.226	1.902	14.360	0.001*
Single	1			
Highest education level				
Primary	7.499	0.644	87.393	0.108
Secondary	5.275	0.570	48.806	0.143
Tertiary	6.035	0.511	71.347	0.154
Use of prelacteal feeds				
Maternal illness in the previous 2 weeks		Lower	Upper	
Yes	6.412	1.983	20.732	0.002*
*Significant at p<0.05				

3.4. Morbidity Status Among Children Aged 0 to 6 Months

Nearly half (41.2%) of the children were reported to have been sick in the previous two weeks including the day of the survey (Table 5). Over a third (37.7%) was reported to have been sick with fever and watery diarrhea (31.1%). Minority (13.2%) were reported to have suffered from other symptoms including flu, coughs and upper respiratory tract infections. A small number suffered from difficulty and fast breathing (9.8%), malaria (4.9%) and bloody diarrhea (3.3%) as indicated on Table 5.

Table 5. Morbidity status among children aged 0 to 6 months.

Variable	N		n	%
Child sick in the previous 2 weeks	148		61	41.2
Type of sickness	61	Fever	23	37.7
		Watery diarrhea	19	31.1
		Bloody diarrhea	2	3.3
		Difficulty and fast breathing	6	9.8
		Malaria	3	4.9
		*Others	8	13.2
*Others included; Flu, coughs and upper respiratory tract infections				

3.5. Relationships Between Feeding Practices, Maternal Factors and Morbidity Status

There was a significant relationship between monthly income and the likelihood of a child being sick (p=0.036). The researcher went further to check on the strength of the relationship and it was a weak positive relationship (r=0.063, r^2=0.004) as shown in Table 6. No relationships were found between current breastfeeding status and the likelihood of the child being sick (p=0.069), maternal education and child morbidity status (p=0.521), maternal employment and child morbidity status (p=0.072).

Table 6. Relationship between maternal factors, feeding practices and child morbidity.

Variable	Dependent Variable (Morbidity Status) Observations = 148 Model: Logistic Regression using MLE		
	Child sick	Child not sick	P- value
Income (Ksh)			
<= 2000	28	31	
2001 - 5000	15	23	
5000 – 10 000	10	21	0.036*
Above 10, 1000	8	12	
Stats			
R	0.063		
R-Squared	0.004		
Adj R-squared	-0.003		
F-statistic	0.58		
Current breast-feeding status			
Yes	56	84	0.069

*Significant at p<0.05

4. Discussion

4.1. Socio-demographic and Socio-economic Characteristics of the Study Population

Child's demographic characteristics are key in determining feeding practices as well as morbidity status of the child. Morbidity is more prevalent in early days and decreases with increased age [29]. Similarly, a higher prevalence of exclusive breastfeeding is observed in early days and a decrease with increase in age. Consequently this impacts on the morbidity status [36]. The study was conducted among caregivers of children aged 0-6 months where more than two thirds (63.5%) were aged 0-3 months. According to Laksono et al. [37], mother's age is a contributing factor to the child's health where children from older mothers tend to be healthier. Most of the caregivers were young (below 30 years of age) and a small number (17.6%) were more than 30 years of age. Caregiver's education attainment contributes to child's morbidity. According to Nankinga et al. [38], children from well-educated mothers tend to have improved health as a result of better income and informed decisions. Socioeconomic characteristics of caregivers are important for this study as they can affect access of food and health care seeking as a result of low finances. This increases the risk of childhood morbidities [39]. More than half of the respondents had

monthly income of less than Ksh. 2,000 in a month with a small number (12.8%) earning greater than Ksh. 10,000 from all sources. Household food insecurity negatively influences breastfeeding practices [40] and hence, food security is key among lactating mothers.

4.2. Feeding Practices of Children Aged 0-6 Months

It is a good practice that majority (94.6%) of the children (0-6 months) were still breastfeeding. However, a small number (5.41%) were not breastfeeding, some had stopped breastfeeding while some had never breastfed. This is against the WHO recommended practice of exclusive breastfeeding for the first six months and introduction of complementary feeds alongside breastfeeding for up to two years or beyond [5]. This may in the long run deprive the child the many benefits of breast milk including proper growth and development [41].

Early breastfeeding initiation is encouraged as it prevents use of prelacteal feeds which contributes highly to partial breastfeeding [25]. Majority (79.8%) of the children were initiated into breastfeeding within the first hour. This is above the prevalence of early initiation of breastfeeding (EIBF) which is approximately 50% in many developing countries [42]. However, nearly a quarter (20.1%) of the children had breastfeeding initiated after more than an hour. A small number (0.6%) of children were never initiated to breastfeeding. Instead, they were put on exclusive replacement feeding (ERF). This rate is lower than the global ERF rate of 9.4% [19]. A study done in Kiambu level 4 hospital also observed a higher prevalence of ERF (10.4%) among HIV-exposed infants [24]. Majority (90.8%) of the children were breastfed on demand. This is the best recommended practice as the amount of milk produced is influenced by the baby's desire [43].

Over a quarter (26.2%) of the children were given prelacteals before breastfeeding was initiated. This rate was lower compared to a study in Kilifi county where over a third of the mothers gave prelacteal feeds, home remedies and traditional medicines [44]. Over half (52%) of the children were exclusively breastfed. This rate (52%) is above both the global rate and Africa rate where EBF is at 43.5% and 34% respectively [19, 20]. In addition, this EBF rate (52%) is above the cumulative EBF rate (27%) among mother to mother support groups in Meru County [22] and continuous EBF (44%) among parents who underwent couple counseling in Nyando district [23]. However, the rate is below the national EBF prevalence rate of 60% [18].

4.3. Maternal Factors Associated with Child Feeding Practices

Children whose mothers were married were significantly more than five times more likely to be breastfed on demand

compared to children whose mothers were single (OR 5.23, 95% CI 1.90-14.36, p-value 0.001). The finding agrees with [45]. Probably, this commitment of married mothers could be attributed to family support and support from the spouses. Children whose mothers had reported illness in the last two weeks were significantly more than six times more likely (OR 6.41, 95% CI 1.98-20.73, p-value 0.002) to be given other feeds before initiation of breastfeeding. According to Kiani et al. [46], use of prelacteal feeds may interfere with breastfeeding duration and even encourage continuation of mixed feeding. A significant number of children whose mothers had undergone vaginal delivery were breastfeeding (P-value 0.0001). This agrees with Kiani et al. [46] and a finding in Wajir County where mothers who delivered through cesarean section reported initiating pre-lacteals early, experiencing delayed initiation of breastfeeding and interfering with EBF [47]. However, this finding is contrary to Magnano San Lio et al. [48] where no associations were found between mode of delivery and child breastfeeding status. A significant number of children whose mothers were married were breastfeeding (P-value 0.0001). This is in agreement with Flaherman et al. [49] and a study done in Nyeri County where marital status was associated with breastfeeding on demand [50].

4.4. Morbidity Status Among Children Aged 0 to 6 Months

The findings of this study contribute to the growing scientific consensus including report of Mutama et al [14] on childhood morbidities in Kenya. Over a third (37.7%) of the children were reported to have been sick with fever. This rate is above the Trans-Nzoia County rate (17.8%) of children presenting with fever among the wider under-five population [18]. This suggests that among the under-five population presenting with fever, the younger population could be the most affected. Over a third (31.1%) of the children presented with watery diarrhea. This rate is above the general under-five population in Nairobi informal settlements where 16.6% presented with diarrhea [16]. This finding concurs with report of Reiner Jr et al. [12] that diarrhea is among the high prevalent childhood morbidities.

4.5. Relationship Between Maternal Factors, Feeding Practices and Child Morbidity

There was a relationship between monthly income and the likelihood of a child being sick (p=0.036). It is widely known that socioeconomic factors affect child morbidity in Africa [51]. This finding is in agreement with Adedokun & Yaya, De Vita et al. and Orora [52-54] where poverty and low socio-economic status is related to poor health care seeking. However, it is contrary to studies by Piotrowski, Nankinga et al., Anwar et al., and Arthur [55, 38, 56, 39] that found no connection between caregiver's socio-economic status and child's morbidity. The researcher went further to check on the

strength of the relationship and it was a weak positive relationship (r=0.063, r²=0.004). This implied that 0.4% of the child's morbidity was a result of the caregiver's socio-economic status while 99.6% of child's morbidity was due to other factors. No relationship was found between child's breastfeeding status and the likelihood of a child being sick (p=0.069). This finding is contrary to Queenter et al. [57] where EBF uptake was associated with low child morbidity in Kenyatta Hospital.

5. Conclusions

The study concludes that the feeding practices among children aged 0-6 months were inadequate in relation to WHO standards. This is evidenced by use of prelacteals, mixed feeding and replacement feeding. Strengthening institutional health talks among pregnant and lactating mothers could be an effective approach to improve EBF. Nearly half of the children aged 0-6 months suffer from childhood morbidities. Strengthening preventive strategies such as proper hygiene, education and early health care seeking behaviour could reduce childhood illnesses. The study revealed positive associations between mode of delivery and child breastfeeding status, marital status and breastfeeding status, marital status and frequency of breastfeeding. A positive relationship was revealed between monthly income and the likelihood of a child being sick.

Breastfeeding status and frequency of breastfeeding among children aged 0-6 months are influenced by marital status of the caregiver. Child morbidity status is influenced by caregiver's socioeconomic status. Feeding practices among children aged 0-6 months are influenced by maternal characteristics as evidenced by the associations between mode of delivery with breastfeeding status, maternal illness and use of prelacteal feeds. The study recommends timely treatment of illnesses among pregnant and lactating mothers, counseling and support for mothers having children before marriage to build their confidence and commitment on breastfeeding. The study suggests need for all mothers to be counselled on the importance of EBF and the role of good maternal nutrition in promoting EBF. Additional investigation on differences in morbidity between exclusively breastfed and non-breastfed children aged 0 to 6 months in Kwanza Sub County is recommended.

Abbreviations

EBF	Exclusive Breastfeeding
SPSS	Statistical Package for the Social Sciences
KSCH	Kwanza Sub-County Hospital
SDG	Sustainable Development Goal
WBC	Well Baby Clinic
FGD	Focus Group Discussion
KI	Key Informant
HCW	Health Care Worker

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Author Contributions

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Elizabeth Kuria: Supervision, Writing – review & editing

Joseph Kobia: 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 that they have no competing interests.

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Biography
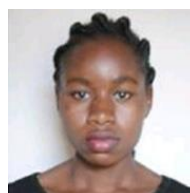
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Research Field

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Elizabeth Kuria: Food and Nutrition Security, Gender, Education & Social Protection

Joseph Kobia: Micronutrient Deficiencies and Infant Young Child Feeding