

Mothers' Knowledge and Practices of Steps to Successful Breastfeeding at Jaramogi Oginga Odinga Teaching and Referral Hospital, Kenya

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DOI: 10.24252/al-sihah.v16i1.45804

Received: 21 February 2024 / In Reviewed: 14 June 2024 / Accepted: 26 June 2024 / Available online: 28 June 2024

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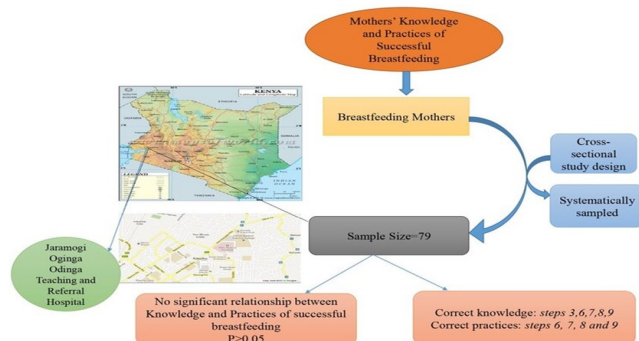
ABSTRACT

The ten steps to successful breastfeeding have been reported to be effective in enhancing mothers' knowledge and practices of breastfeeding in various contexts. However, within the Kenyan context, there is limited literature on mothers' knowledge and practices regarding these steps despite high breastfeeding-related child morbidity and mortality rates. This study aimed to evaluate mothers' knowledge, confirm practices of the steps to successful breastfeeding, and establish the relationship between mothers' knowledge and corresponding practices of these steps. The study site was Jaramogi Oginga Odinga Teaching and Referral Hospital, Kenya. A cross-sectional study design was used, and 79 breastfeeding mothers were systematically sampled. Data were collected through a researcher-administered questionnaire and an observation checklist. Data analysis was performed using descriptive statistics; frequencies and percentages to show mothers' knowledge and practice distribution. Binary logistic regression was performed to establish a relationship between the two variables. Results were presented in tables. Mothers' knowledge of steps 3, 6, 7, 8, and 9 met the global criteria for successful breastfeeding; however, only practices of steps 6, 7, 8, and 9 met these criteria. There was no significant relationship between mothers' knowledge and corresponding practices of all the steps ($P>0.05$). Skill-based training may be necessary to improve successful breastfeeding practices.

ABSTRAK

Sepuluh langkah menuju keberhasilan menyusui telah dilaporkan efektif dalam meningkatkan pengetahuan ibu dan praktik menyusui dalam berbagai konteks. Namun, dalam konteks Kenya, penelitian mengenai pengetahuan dan praktik ibu tentang langkah-langkah ini masih terbatas meskipun angka morbiditas dan mortalitas anak terkait pemberian ASI masih tinggi. Penelitian ini bertujuan untuk mengevaluasi pengetahuan ibu, menetapkan praktik langkah-langkah menuju keberhasilan menyusui, dan menentukan hubungan antara pengetahuan ibu dan praktik terkait langkah-langkah tersebut. Lokasi penelitian adalah Rumah Sakit Pendidikan dan Rujukan Jaramogi Oginga Odinga, Kenya. Desain penelitian cross-sectional digunakan dan 79 ibu menyusui dijadikan sampel secara sistematis. Data dikumpulkan melalui kuesioner yang diberikan peneliti dan daftar observasi. Analisis data dilakukan dengan menggunakan statistik deskriptif; frekuensi dan persentase untuk menunjukkan distribusi pengetahuan dan praktik ibu. Regresi logistik biner dilakukan untuk menentukan hubungan antara kedua variabel. Hasilnya disajikan dalam tabel. Pengetahuan ibu tentang langkah-langkah 3, 6, 7, 8, dan 9 memenuhi kriteria global untuk keberhasilan menyusui; namun hanya praktik pada langkah 6, 7, 8, dan 9 yang memenuhi kriteria ini. Tidak ada hubungan yang signifikan antara pengetahuan ibu dan praktik terkait pada seluruh langkah ($P>0.05$). Pelatihan berbasis keterampilan mungkin diperlukan untuk meningkatkan keberhasilan praktik menyusui.

GRAPHICAL ABSTRACT



Keyword

breastfeeding
hospitals
kenya
knowledge
mothers

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INTRODUCTION

Breastfeeding provides the necessary nutrients and antibodies that nourish the body and protect infants from illness, and breastfeeding-related deaths (Gupta et al., 2023). Optimal breastfeeding encompasses initiating breastfeeding as soon as possible after birth, followed by exclusive breastfeeding for six months, thereafter, introducing safe, and nutritious foods that are age-appropriate to the infant as the mother continues to breastfeed (Mohamud et al., 2021). To sustain, support and promote breastfeeding, Baby Friendly Hospital Initiative was initiated in 1991; it has ten steps to successful breastfeeding which include step 3 (breastfeeding management and importance), step 4 (skin-to-skin contact and initiation of breastfeeding as soon as possible after birth), step 5 (Initiation and maintenance of breastfeeding, and related difficulties), step 6 (giving breastmilk only for six months), step 7 (staying together with the baby 24 hours day and night), step 8 (recognizing and responding to cues), step 9 (informing about the risks of using of teats, feeding bottles, and pacifiers) and step 10 (breastfeeding help post-discharge) (Lestari, 2020). However, despite efforts to implement these best practices, breastfeeding rates are still low both globally, and regionally, leading to high breastfeeding-related child morbidity and mortality.

Globally, as of 2023, only 48% of children are exclusively breastfed; these are those below six months, and 46% are initiated on breastmilk as soon as possible after birth, this is still below the Global Assembly Target of 50%, and 70% respectively (UNICEF, 2023). In the developing world, only 39% are exclusively breastfed in Africa (Lisna et al., 2019). In Kenya, the exclusive breastfeeding rate is at 60%, shy of the global target of 70% (UNICEF, 2023). However, in Kenya, the rate of exclusive breastfeeding drops from 84.1% among children aged 0-1 month to 42% among children aged between 3-6 months raising questions about the sustenance of breastfeeding as a child grows

(Kimani-Murage et al., 2021). Further, about 91% of children experience delayed breastfeeding; across regions in Kenya, the Nyanza region where the study, was done, has about 95.3% of children having delayed breastfeeding (Kimani-Murage et al., 2021). About 45% of child mortality is attributed to these low breastfeeding rates (World Health Organization, 2022). Globally, infant mortality stands at 29 deaths per 1000 live births, 74 deaths per 1000 live births is the under-five mortality rate that has been recorded in Africa, the rate of under-five mortality is with Kenya recording 37.2 deaths per 1000 live births. In Kenya, the highest child mortality rate (82 deaths per 1000 live births) has been recorded in Nyanza (UNICEF, 2024).

Mothers' knowledge of the steps to successful breastfeeding is key to influencing their practices on these steps, further improving breastfeeding, child nutrition, and child health outcomes; helping reduce risks of breastfeeding-related child morbidity and mortality (Kehinde et al., 2023). According to Kivlighan et al. (2020), when successful breastfeeding is well implemented in hospitals designated baby-friendly leads to longer breastfeeding duration. According to Das et al. (2023) mothers who are not knowledgeable about breastfeeding support contained in the steps to successful breastfeeding are unlikely to practice steps to successful breastfeeding, the results were consistent with Oueidat et al. (2020) who found that lack of knowledge in key areas of successful breastfeeding is linked to poor practices. There is limited literature on mothers' knowledge and practices of steps to successful breastfeeding that can inform best practices, improve breastfeeding, and reduce related illnesses and deaths within the Kenyan context currently. According to Tarkwen (2020), there is limited knowledge of the steps to successful breastfeeding; however, this study only covered step 6; step 4, and introduction of pre-lacteal feed; this is insufficient and does not cover all the steps on key clinical practices. In another study by Moraa, (2019), 50% of mothers attending Jaramogi Og-

inga Odinga Teaching and Referral Hospital, were not practicing breastfeeding for a period not less than six months at the hospital; however, this study only evaluated one step of successful breastfeeding; hence need for a more comprehensive study on all steps of successful breastfeeding. It is in this light that this study evaluated mothers' knowledge, and ascertained practices of all steps to successful breastfeeding. This study hypothesized a significant relationship between the knowledge of the steps to successful breastfeeding and corresponding practices.

METHODS

A hospital-based cross-sectional study design was applied. The study site was Jaramogi Oginga Odinga Teaching and Referral Hospital, Kisumu County, Kenya. The study was conducted between January 1st to March 30th, 2023. The population consisted of breastfeeding mothers who were above 18 years old and had given birth at the hospital. Sample size determination was calculated using Fischer's formula with a finite population, generating 79 participants. A systematic sampling method was used to select the 79 breastfeeding mothers to participate in the study. Systematic sampling was chosen as it provided an equal chance for the mothers to be selected, ensuring that the sample represented the whole population (Tarkwen, 2020). Data collection on mothers' knowledge of the steps to successful breastfeeding was done using the Baby Friendly Hospital Initiative Questionnaire (BFHI) for Breastfeeding Mothers and an observation checklist that was used to observe the corresponding practices of these steps. These tools provide a holistic understanding of the mothers' knowledge and practices of steps to successful breastfeeding (Mothukuri et al., 2021). Interviews were conducted using the BFHI questionnaires while the observation checklist helped to collect data through observation. Statistical Package for Social Sciences (SPSS) version 29 was used to perform data analysis

where frequencies and percentages were used to analyze mothers' knowledge and practices of successful breastfeeding. To establish the relationship between mothers' knowledge and practice of the steps to successful breastfeeding, a binary logic regression analysis was performed. Data was presented in tables. The study adhered to various ethical considerations (Salerno et al., 2023). First, the ethical principle of autonomy was met; The purpose of the study was explained to the mothers. They were also informed about the role they were to play in data collection. They were also informed about their right to withdraw from the study at their will, at any time without any penalty. They were asked to consent on the written consent form through thumbprint or signing. Anonymity, privacy, and confidentiality were maintained throughout the study. Approval was sought from Masinde Muliro University of Science and Technology (MMUST) directorate of postgraduate studies, MMUST Institutional Ethics and Review Committee, and Jaramogi Oginga Odinga Teaching and Referral Hospital (JOOTRH) Ethics and Review Committee. A Research permit to ensure that the study was ethically accountable and respected the rights of the participants was sought from the National Commission for Science and Technology (NACOSTI) under license number: NACOSTI/P/22/22492.

RESULTS

According to Table 1 majority of the mothers (94.9%) were informed about step 3 while only 5.1% were not informed. On step 4 (skin-to-skin contact and early initiation of breastfeeding), 43% of mothers were informed while the majority 57% were not informed. On step 5 (Positioning, Attachment, and Expression of breastmilk), 38% of mothers were informed, with the majority 62% not informed. On step 6 (On exclusive breastfeeding), 93.7% were knowledgeable about the need to practice exclusive breastfeeding and only 6.3% were not informed. On step 7 (rooming in 24 hours),

Table 1
Mothers Knowledge of Steps to Successful Breastfeeding

Mothers Knowledge	Criteria	Frequency	Percentages
Importance and Management of Breastfeeding	Informed	75	94.9
	Uninformed	4	5.1
Skin to Skin Contact, and Early Initiation of Breastfeeding	Informed	34	43
	Uninformed	45	57
Positioning, Attachment, and Expression of Breastmilk	Informed	30	38
	Uninformed	49	62
No Any Food or Drink to Newborn Except Breastmilk	Informed	74	93.7
	Uninformed	5	6.3
Rooming in 24 Hours a Day	Informed	75	94.9
	Uninformed	4	5.1
Recognizing and Responding to Cues	Informed	73	92.4
	Uninformed	6	7.6
Use and Risks of Teats, Bottles and Pacifier	Informed	64	81
	Uninformed	15	19
Post-Discharge Breastfeeding Help	Informed	24	30.4
	Uninformed	55	69.6

Note: Informed = knowledge on the step; Uninformed = lack of knowledge on the step

94.9% of the mothers were aware of the need to practice rooming-in while only 5.1% were not aware. The majority of the mothers (92.4%) were informed about what to look for when to know that their baby was hungry and wanted to feed (step 8), only 7.6% were not informed. The majority of the mothers (81.0%) were informed about the use and risks of using bottles, teats, and pacifiers in feeding their babies (step 9), while only 19.0% were not informed. Only 30.4% of mothers reported that they were informed to seek support with breastfeeding from a hospital, and 69.6% were not informed where they could access such help.

Table 2 presents the results of mothers' practices of steps to successful breastfeeding. Only 11.4% practised step 3 correctly while only 88.6% could not. On step 4, 72.2% of mothers demonstrated correct practice and 27.8% did not. Only 38.0% of mothers could correctly practice step 5 while the majority (62.0%) could not. The majority of mothers practiced step 6 (89.9%) while 10.1% did. On step 7, the majority practiced rooming in (96.2%) with only 3.8% failing to demonstrate correct practice. The majority of the mothers could correctly practice step 8 (86.1%), but only 13.9% could not. On step 9, Majority of women (93.7%) practiced it correctly, while 6.3% did not. Lastly, only 21.5% demonstrated

correct practice on step 10 while the majority (78.5%) could not.

Table 3 are results of binary logic regression. It presents the B coefficient, and Exp (B) value to show the relationship between knowledge of various steps of successful knowledge and corresponding practices and whether the relationship is significant at the p-value while controlling for confounders (age, education level, marital status). In Step 3, the B coefficient is -2.021 suggesting that as mothers' knowledge of the importance of breastfeeding increases, the odds of positive breastfeeding practice for this step decrease by approximately 87%. However, this change is not statistically significant ($p = 0.178$). In Step 4, the B coefficient of 0.505 suggests that as mothers' knowledge of skin-to-skin contact and initiation of breastfeeding as soon as possible after birth increases, the odds of positive breastfeeding practice of this step increase by approximately 66%. However, this change is not statistically significant ($p = 0.374$). In step 5, the B coefficient of 0.023 indicates that as mothers' knowledge of initiation and maintenance of breastfeeding, and related difficulties increase, the odds of positive practices for this step change minimally ($\text{Exp}(B) = 1.023$). However, this change is statistically insignificant ($p = 0.963$). In Step 6, the B coefficient of -0.353

Table 2
Mothers Practices of Steps to Successful Breastfeeding

Practices Observed	Criteria	Frequency	Percentages
Importance and Management of Breastfeeding	Yes	9	11.4
	No	70	88.6
Skin to Skin Contact, and Early Initiation of Breastfeeding	Yes	57	72.2
	No	22	27.8
Positioning, Attachment, and Expression of Breastmilk	Yes	30	38
	No	49	62
No Food or Drink to Newborn Except Breastmilk	Yes	71	89.9
	No	8	10.1
Rooming in 24 Hours a Day	Yes	76	96.2
	No	3	3.8
Recognizing and Responding to Cues	Yes	68	86.1
	No	11	13.9
Baby not Sucking Pacifier in Maternity	Yes	74	93.7
	No	5	6.3
Post-Discharge Breastfeeding Help	Yes	17	21.5
	No	62	78.5

Note: Yes = Correct practice; No = Incorrect practice

indicates that as mothers' knowledge of exclusive breastfeeding increases, the odds of positive breastfeeding practices decrease by approximately 30%. However, this change is not statistically significant ($p = 0.65$). In step 7, the B coefficient of 2.359 indicates that as mothers' knowledge of rooming 24 hours a day increases, the odds of positive breastfeeding practices for this step significantly increase by approximately 958% ($\text{Exp}(B) = 10.582$). However, this change is not statistically significant ($p = 0.092$). In Step 8, the B coefficient of 0.052 indicates that as mothers' knowledge of recognizing and responding to cues increases, the odds of positive breastfeeding practices for this step change minimally ($\text{Exp}(B) = 1.053$). However, this change is not statistically significant ($p = 0.965$). In Step 9, the B coefficient of 0.523 indicates that as mothers' knowledge of the risks of using teats, feeding bottles, and pacifiers increases, the odds of positive breastfeeding practice for this step change slightly ($\text{Exp}(B) = 1.688$). However, this change is not statistically significant ($p = 0.674$). Lastly, in Step 10, the B coefficient of 0.759 indicates that as mothers were informed of the need for breastfeeding help post-discharge, the odds of positive breastfeeding practices increased by approximately 114% ($\text{Exp}(B) = 2.136$). However, this change is not statistically significant ($p = 0.245$).

DISCUSSION

The majority of mothers were informed on step three on the importance and Management of Breastfeeding and met the global World Health Organization set criteria of 70% (World Health Organization [WHO], 2024). The findings of this study are relatable to von Seehausen et al. (2023) that found that mothers in Baby-friendly certified hospitals are well-informed about exclusive breastfeeding, the study reported that 79% of mothers were well-informed and practiced exclusive breastfeeding, however, the study only investigated knowledge and practice of exclusive breastfeeding and did not look at other ways of maintaining breastfeeding, which makes the findings of this study unique as it looks on all the 3 critical areas of managing to breastfeed. Despite showing good knowledge of step 3, mothers performed poorly on this step, this is contrary to a study by von Seehausen et al. (2023) that noted that being aware of the benefits of breastfeeding is key to promoting successful breastfeeding practices. In step 4, mothers' knowledge of the need to maintain skin-to-skin contact, and early initiation of breastfeeding was below the global criteria of 75%, and practice of this step was also below the set criteria; these findings are relatable with Agbozo et al. (2020) that reported low knowledge and overall compliance with this step recording only 31%. However, these results were contrary to

Table 3*Relationship Between Mothers' Knowledge and Practices of Steps to Successful Breastfeeding*

Variables	Coefficient (B)	Standard Error	Wald Statistic	df	Sig	Odds Ratio (Exp(B))
Importance and Management of Breastfeeding	-2.021	1.501	1.814	1	0.178	0.132
Age	0.183	0.425	0.185	1	0.667	1.201
Marital Status	18.554	5428.1	0	1	0.997	1.108
Education	-0.534	0.512	1.089	1	0.297	0.586
Skin to Skin Contact, and Early Initiation of Breastfeeding	0.505	0.568	0.791	1	0.374	1.657
Age	0.173	0.288	0.361	1	0.548	1.189
Marital Status	-0.042	0.285	0.021	1	0.884	0.959
Education	0.434	0.369	1.381	1	0.24	1.544
Positioning, Attachment, and Expression of breastmilk	0.023	0.501	0.002	1	0.963	1.023
Age	-0.253	0.262	0.932	1	0.334	0.777
Marital Status	0.182	0.265	0.472	1	0.492	1.2
Education	-0.094	0.341	0.076	1	0.783	0.91
No any food or drink to newborn except breastmilk	-0.353	0.779	0.205	1	0.65	0.702
Age	-0.223	0.259	0.743	1	0.389	0.8
Marital Status	0.169	0.268	0.398	1	0.528	1.184
Education	-0.076	0.342	0.049	1	0.825	0.927
Rooming in 24 hours a day	2.359	1.4	2.842	1	0.092	10.582
Age	-0.46	0.68	0.458	1	0.499	0.631
Marital Status	-0.085	0.919	0.009	1	0.926	0.918
Education	1.13	1.015	1.241	1	0.265	3.097
Recognizing and Responding to Infant Feeding Cues	0.052	1.172	0.002	1	0.965	1.053
Age	-0.163	0.382	0.183	1	0.669	0.85
Marital Status	0.235	0.311	0.574	1	0.449	1.265
Education	-0.572	0.545	1.103	1	0.294	0.564
Use and Risks of Teats, Bottles and Pacifier	0.523	1.245	0.177	1	0.674	1.688
Age	0.19	0.548	0.12	1	0.729	1.209
Marital Status	-0.483	0.692	0.488	1	0.485	0.617
Education	-1.692	1.076	2.475	1	0.116	0.184
Post-Discharge Breastfeeding Help	0.759	0.652	1.354	1	0.245	2.136
Age	-0.452	0.322	1.974	1	0.16	0.637
Marital Status	-0.264	0.283	0.872	1	0.35	0.768
Education	0.899	0.495	3.306	1	0.069	2.458

Note: Sig = Significance; df = Degrees of Freedom

Maastrup et al. (2019) who recorded higher scores in high-income countries, pointing to differences in implementation capacity between middle-income countries like Kenya, and high-income countries. Skin-to-skin contact and earlier initiation of breastfeeding have been linked to longer breastfeeding duration and reduced morbidity and mortality (Woldeamanuel, 2020). Liberty et al. (2019) linked early Initiation of breastfeeding within the first hour of birth to sustenance of breastfeeding and reduction of life-threatening conditions that are common among newborns. The majority of mothers were

also not aware of how they position, attachment, and expression of breastmilk (Step 5), and recorded lower than the recommended 80% by WHO (2024). Mothers could also not correctly practice this step. A study by Connolly et al. (2019) reported a different finding; that 96% of the mothers in a baby-friendly certified hospital were informed and could practice expression of breastmilk. The difference could be due to the different steps that hospitals take towards the implementation of baby-friendly hospital initiatives. To manage typical difficulties, and ensure appropriate initiation of breastfeeding, the staff

should show the mother how to express breastmilk and attach their babies appropriately (Connolly et al., 2019). The majority of mothers were knowledgeable and practiced step 6, this study was consistent with von Seehausen et al., 2023 that reported 79% of mothers met the criteria for step 6. The majority of mothers were also knowledgeable and practiced rooming in 24 hours, this aligns with the global criteria of 80% (WHO, 2024). However, while the majority of mothers were knowledgeable about recognizing and responding to baby feeding cues, very few could recognize these cues correctly; the gap between the knowledge and practices shows a lack of practical skills to promote breastfeeding in this step (Mothukuri et al., 2021). The findings of this study are consistent with McNally et al. (2020) which found a gap in the practice of responsive baby feeding. The majority of mothers were informed of the risks associated with Baby Sucking Pacifiers, bottles, or teats, and the majority did not give their babies any of the three; knowledge and practice met the 80% set criteria by WHO (2024). Using pacifiers, teats, or pacifiers interrupts breastfeeding and should not be encouraged in maternity as it interferes with the breastfeeding, and also puts the baby at a higher risk of infections (Oueidat et al., 2020). Lastly, the mother's knowledge and practice on step 10 (post-discharge breastfeeding support) was way below the 80% target according to (WHO, 2024). Gianni et al. (2019) reported a lack of ongoing support among healthcare service providers. There is a need for hospitals designated baby-friendly to provide post-discharge support to sustain breastfeeding (Kavle et al., 2019).

Findings show that greater knowledge of successful breastfeeding is associated with better practices of steps 4 (Skin to Skin Contact, and Early Initiation of Breastfeeding), step 5 (Positioning, Attachment, and Expression of breastmilk), step 7 (rooming in), step 8 (Recognizing and Responding to Infant Feeding Cues), step 9 (use of bottles, teats and pacifiers), and step 10 (post-discharge breastfeeding

support) (odds ratio > 1), however, for the two steps; step 3 (management and benefits of breastfeeding), and steps 6 (exclusive breastfeeding), an increase in knowledge of steps to successful breastfeeding, is less likely to lead to corresponding practice (odds ratio < 1). The study finds a positive association between knowledge and practices of most of the steps to successful breastfeeding; these findings are consistent with Oueidat et al. (2020) who reported that information on successful breastfeeding is more likely to lead to practices of successful breastfeeding. However, the p-value does not show any significant relationship between knowledge and corresponding practices of all the steps of successful breastfeeding ($P > 0.05$), this is consistent with Dukuzumuremyi et al. (2020) that found an insignificant relationship between mothers knowledge and practice of exclusive breastfeeding (step 6), although this study did not establish a relationship in other steps of successful breastfeeding, however, this study is contrary to Oueidat et al. (2020) that found a significant association between knowledge and practices of rooming in ($p = 0.037$), skin-to-skin contact ($p < 0.001$), and breastfeeding support ($p = 0.036$). Lack of consistency in results points to implementation gaps in successful breastfeeding which varies from one hospital to another (Lokeesan et al., 2022). The findings underscore the importance of strengthening implementation towards improving practices of successful breastfeeding to support breastfeeding outcomes, improve child health, and reduce breastfeeding-related mortality and morbidity.

The strength of this study is that it incorporated data collection through observation, making it easier to capture the lived experiences of the population, and also gather data in real-time, making it more accurate (Honey et al., 2020). A major limitation of the study is depending on the subject's recall capability in evaluating mothers' knowledge of steps to successful breastfeeding posing a bias risk in reporting since the subject relied on memory

(Radomsky et al., 2024). However, this was complemented by observation of practices of steps to successful breastfeeding where necessary. The study was not able to follow the participants in the long term to determine the sustenance of these practices beyond the hospital setting, a longitudinal study that follows mothers to assess this is necessary.

CONCLUSIONS

Mothers' knowledge about Step 3 (importance and maintenance of breastfeeding) step 6 (exclusive breastfeeding), step 7 (rooming in), step 8 (recognizing and responding to baby feeding cues) and Step 9 (giving no artificial teats or pacifiers) met the World Health Organization global set criteria; however, they could only practice steps 6 (exclusive breastfeeding), 7 (rooming in), 8 (recognizing and responding to baby feeding cues) and step 9 (giving no artificial teats or pacifiers) since mothers' knowledge, and practices of these critical steps was above the set criteria in a baby-friendly certified hospital (WHO, 2024). The findings show significant gaps between mothers' knowledge and corresponding practices of steps to successful breastfeeding. Identification of these gaps lays the basis for interventions aimed at supporting breastfeeding on these steps, improving child health outcomes, and reducing child morbidity and mortality rates. The study findings are also useful in coming up with a training manual that helps mothers acquire practical skills on steps to successful breastfeeding. The County Government of Kisumu and the management of Jaramogi Oginga Odinga Teaching and Referral Hospital should implement practical breastfeeding support through training and workshops. Future research is necessary to help determine factors that lead to the gap between mothers' knowledge and practices of successful breastfeeding.

ACKNOWLEDGEMENT

The authors are grateful to the mothers who participated in this study. The authors are also grateful to Jaramogi Oginga Odinga Teaching and Referral Hospital for their support. Lastly, we wish to acknowledge Rosalida Nyapala, Susan Agutu, Nyadolo Rori, Cynthia Sandra, and Marry Kerry Agutu for their support.

FUNDING

The authors did not receive funding to support research, publication, and authorship of this article.

AUTHORS' CONTRIBUTIONS

Wycliffe Agutu formulated the concept, collected and analysed the data, and performed the field work. Jane Situma and Lucy Mutulioversaw data collection and supervision and editorial guidance. All Authors designed the study, wrote and revised the manuscript, and read and approved the final manuscript.

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COMPETING INTERESTS

The authors confirm that all of the text, figures, and tables in the submitted manuscript work are original work created by the authors and that there are no competing professional, financial, or personal interests from other parties.

REFERENCES

- Agbozo, F., Ocansey, D., Atitto, P., & Jahn, A. (2020). Compliance of a Baby-Friendly Designated Hospital in Ghana With the WHO/UNICEF Baby and Mother-Friendly Care Practices. *Journal of Human Lactation*, 36(1). <https://doi.org/10.1177/0890334419848728>
- Connolly, E., Reinkowsky, M., Giglia, R., Sexton, B., Lyons-Wall, P., Lo, J., & O'Sullivan, T. A. (2019). Education on antenatal colostrum expression and the Baby Friendly Health Initiative in an Australian hospital: An audit of birth and breastfeeding outcomes. *Breastfeeding Review*, 27(1).
- Das, N. L., Khan, M. F. K., Azam, M. S., Rouf, M., Sultana, M., Afroz, S. S., Islam, K. T., & Alam, M. S. (2023). Study on Impact of Tertiary Care Baby Friendly Hospital on Exclusive Breast Feeding and Child Health. *Journal of Shaheed Suhrawardy Medical College*, 13(2). <https://doi.org/10.3329/jssmc.v13i2.65180>
- Dukuzumuremyi, J. P. C., Acheampong, K., Abesig, J., & Luo, J. (2020). Knowledge, attitude, and practice of exclusive breastfeeding among mothers in East Africa: a systematic review. *International breastfeeding journal*, 15, 1-17. <https://doi.org/10.1186/s13006-020-00313-9>.
- Gianni, M. L., Bettinelli, M. E., Manfra, P., Sorrentino, G., Bezze, E., Plevani, L., Cavallaro, G., Raffaelli, G., Crippa, B. L., Colombo, L., Mornioli, D., Liotto, N., Roggero, P., Villamor, E., Marchisio, P., & Mosca, F. (2019). Breastfeeding difficulties and risk for early breastfeeding cessation. *Nutrients*, 11(10). <https://doi.org/10.3390/nu11102266>
- Gupta, S., Pajai, S., & Pawade, A. A. (2023). Benefits of Breastfeeding on Child and Postpartum Psychological Health of the Mother. In *Journal of SAFOG* (Vol. 15, Issue 2).

- <https://doi.org/10.5005/jp-journals-10006-2217>
- Honey, A., Boydell, K. M., Coniglio, F., Do, T. T., Dunn, L., Gill, K., Glover, H., Hines, M., Scanlan, J. N., & Tooth, B. (2020). Lived experience research as a resource for recovery: A mixed methods study. *BMC Psychiatry*, 20(1). <https://doi.org/10.1186/s12888-020-02861-0>
- Kavle, J. A., Ahoya, B., Kiige, L., Mwando, R., Olwenyi, F., Straubinger, S., & Gathi, C. M. (2019). Baby-Friendly Community Initiative—From national guidelines to implementation: A multisectoral platform for improving infant and young child feeding practices and integrated health services. *Maternal and Child Nutrition*, 15. <https://doi.org/10.1111/mcn.12747>
- Kehinde, J., O'Donnell, C., & Grealish, A. (2023). The effectiveness of prenatal breastfeeding education on breastfeeding uptake postpartum: A systematic review. In *Midwifery* (Vol. 118). <https://doi.org/10.1016/j.midw.2022.103579>
- Kimani-Murage, E. W., Kimiywe, J., Mutoro, A. N., Wilunda, C., Wekesah, F. M., Muriuki, P., Mwangi, B. M., Samburu, B. M., Madise, N. J., McGarvey, S. T., & Griffiths, P. L. (2021). Effectiveness of the baby-friendly community initiative on exclusive breastfeeding in Kenya. *Maternal and Child Nutrition*, 17(3). <https://doi.org/10.1111/mcn.13142>
- Kivlighan, K. T., Murray-Krezan, C., Schwartz, T., Shuster, G., & Cox, K. (2020). Improved breastfeeding duration with Baby Friendly Hospital Initiative implementation in a diverse and underserved population. *Birth*, 47(1). <https://doi.org/10.1111/birt.12468>
- Lestari, P. P. (2020). Review: Implementasi Baby Friendly Hospital Initiative (Inisiasi Rumah Sakit Sayang Ibu) Dan Keberhasilan Menyusui Eksklusif. *Jurnal Ilmiah Umum Dan Kesehatan Aisyiyah*, 5(1).
- Liberty, A. L., Wouk, K., Chetwynd, E., & Ringel-Kulka, T. (2019). A Geospatial Analysis of the Impact of the Baby-Friendly Hospital Initiative on Breastfeeding Initiation in North Carolina. *Journal of Human Lactation*, 35(1). <https://doi.org/10.1177/0890334418776645>
- Lisna, A., Arifin, R. Y. A., & Anjasmar, R. A. (2019). Early Breastfeeding Initiation in Indonesia. *Journal of Ultimate Public Health*, 3(1). <https://doi.org/10.22236/jump-health.v3.i1.p163-168>
- Lokeesan, L., Martin, E., & Miller, Y. (2022). Scoping Review of Baby-Friendly Hospital Initiative Compliance and Breastfeeding Initiation in Sri Lanka. In *JOGNN - Journal of Obstetric, Gynecologic, and Neonatal Nursing* (Vol. 51, Issue 2). <https://doi.org/10.1016/j.jogn.2021.12.005>
- Maastrup, R., Haiek, L. N., Lubbe, W., Meerkin, D. Y., Wolff, L., Hatasaki, K., Alsumaie, M. A., De Leon-Mendoza, S., Ng, Y. P. M., Shorey, S., Conti, R., Leme, T., Rossetto, E. G., Acosta, A. A., Nuñez, A. E. O., Toala, E., Gonzalez, M. E. O., Berger, A., Hennequin, Y., O'Donoghue, D. (2019). Compliance with the “Baby-friendly Hospital Initiative for Neonatal Wards” in 36 countries. *Maternal and Child Nutrition*, 15(2). <https://doi.org/10.1111/mcn.12690>
- McNally, J., Hugh-Jones, S., & Hetherington, M. M. (2020). “An invisible map” - maternal perceptions of hunger, satiation and ‘enough’ in the context of baby-led and traditional complementary feeding practices. *Appetite*, 148. <https://doi.org/10.1016/j.appet.2020.104608>
- Mohamud, A. M., Nzioki, J. M., & Muhamud, C. (2021). Prevalence of Optimal Breastfeeding and Maternal and Child Health Care Service-Related Factors Associated with Optimal Breastfeeding in Dollow District, Somalia. *African Journal of Health Sciences*, 34(2). <https://www.ajol.info/index.php/ajhs/article/view/210079>
- Moraa, D. (2019). *Predictors of exclusive breast-feeding among women in formal employment attending child welfare clinic at Jaramogi Oginga Odinga Teaching and Referral Hospital*.
- Mothukuri, R., Kumar, S., & Sowndarya, R. (2021). A study to Assess the Knowledge and Practice of Staff Nurses and Postnatal Mothers on Implementation of Baby Friendly Hospital Initiative in a Tertiary Care Hospital in Chennai. *Journal of Pharmaceutical Research International*. <https://doi.org/10.9734/jpri/2021/v33i1531288>
- Oueidat, H., Charafeddine, L., Nimer, H., Hussein, H., & Nabulsi, M. (2020). Knowledge and attitudes of Lebanese women towards Baby Friendly Hospital Initiative practices. *PLoS ONE*, 15(9 September). <https://doi.org/10.1371/journal.pone.0238730>
- Radomsky, A. S., Ouellet-Courtois, C., Golden, E., Senn, J. M., & Parrish, C. L. (2024). Putting things right: An experimental investigation of memory biases related to symmetry, ordering and arranging behaviour. *Journal of Behavior Therapy and Experimental Psychiatry*, 82. <https://doi.org/10.1016/j.jbtep.2023.101914>
- Salerno, J., Coughlin, S. S., Goodman, K. W., & Hlaing, W. W. M. (2023). Current ethical and social issues in epidemiology. *Annals of Epidemiology*, 80. <https://doi.org/10.1016/j.annepidem.2023.02.001>
- Tarkwen, P. (2020). Breastfeeding Mothers’ Knowledge on Ten Steps to Successful Breastfeeding in Kapsabet County Hospital, Nandi County, Kenya. *International Journal of Scientific and Research Publications (IJSRP)*, 10(8), 70–81. <https://doi.org/10.29322/ijserp.10.08.2020.p10412>
- UNICEF. (2023). *Global breastfeeding scorecard 2023 rates of breastfeeding increase around the world through improved protection and support*. <https://www.unicef.org/media/150586/file/Global%20breastfeeding%20scorecard%202023.pdf>
- UNICEF. (2024). *Infant mortality*. <https://www.who.int/data/gho/data/themes/topics/indicator-groups/indicator-group-details/GHO/infant-mortality>
- von Seehausen, M. P., de Oliveira, M. I. C., do Carmo Leal, M., Domingues, R. M. S. M., & Boccolini, C. S. (2023). Baby-Friendly Hospital Initiative and exclusive breastfeeding during hospital stay. *Revista de Saude Publica*, 57(1). <https://doi.org/10.11606/S1518-8787.2023057004283>
- Woldeamanuel, B. T. (2020). Trends and factors associated to early initiation of breastfeeding, exclusive breastfeeding and duration of breastfeeding in Ethiopia: Evidence from the Ethiopia Demographic and Health Survey 2016. *International Breastfeeding Journal*, 15(1). <https://doi.org/10.1186/s13006-019-0248-3>
- World Health Organization (2022). *Child mortality (under 5 years)*. *Fact Sheets, January*.
- World Health Organization. (2024). *Implementation Guidance 2018, Protecting, promoting and supporting Breastfeeding in facilities providing maternity and newborn services: the revised Baby-Friendly Hospital Initiative*. <http://apps.who.int/bookorders>