South African Journal of Clinical Nutrition 2025; 38(2):48–54
https://doi.org/10.1080/16070658.2025.2460926

SAJCN
ISSN 1607-0658 EISSN 2221-1268

RESEARCH ARTICLE

Feeding practices of very low birthweight infants born 2018 at a tertiary hospital in South Africa

AM Haughton and IA Michaelis

Paediatric Department, Walter Sisulu University, Mthatha, South Africa
**Correspondence: isabel.michaelis@echealth.gov.za; isabelmichaelis@gmail.com*

Introduction: In recent decades, there has been a global increase in the birth and survival rates of very low birthweight (VLBW) infants. Breastfeeding plays a crucial role in providing optimal nutrition for the growth and development of these infants, particularly in poverty-stricken areas with a high prevalence of childhood malnutrition.
Aim: This study aimed to assess the rate of exclusive breastfeeding (EBF) among VLBW infants at six months' corrected age and to identify the reasons for premature cessation of EBF. Additionally, it examined the volume of replacement feeds administered to infants who were not exclusively breastfed.
Method: A retrospective study was conducted on VLBW infants born at a tertiary hospital in South Africa. Data on infant–mother pairs were collected at birth and the follow-up visits at one, three and six months to document feeding practices and reasons for discontinuation of exclusive breastfeeding (EBF).
Results: Of 117 infant–mother pairs, the prevalence of EBF at six months' corrected age was 22%. The primary reasons for discontinuation of EBF were maternal commitments to school or work and perceived insufficient supply of breast milk. Over time, there was an increase in replacement feeds, predominantly formula, with a significant portion being prepared incorrectly.
Conclusions: The prevalence of EBF among VLBW infants at six months remains suboptimal, influenced by maternal perceptions and commitments. Effective interventions are crucial to improve EBF rates, especially in this vulnerable population.

Keywords: exclusively breastfeeding, low resource setting, sub-Saharan Africa, very low birthweight infants

Introduction

The significance and advantages of breastfeeding infants for up to two years are widely acknowledged. Breastfeeding offers suitable nutrition for optimal growth and development of all infants, including preterm and low-birthweight infants, and cannot be adequately replaced by other substances.[1–4]

Since 1996, South Africa has been committed to promoting breastfeeding and appropriate complementary feeding practices for infants by implementing a wide range of international child rights and public health instruments.[3] Despite these efforts, data suggest that nearly 90% of mothers initiate breastfeeding at birth, but only around 32% continue to exclusively breastfeed their infants up to six months of life.[5–7] Failure to exclusively breastfeed for six months or provide any amount of breast milk remain major challenges in South Africa and globally.[4,5,8] Various factors contribute to this, including maternal healthcare, the knowledge of healthcare workers in both ante- and postnatal settings, as well as individual, cultural, sociodemographic and political factors.[7,8] Additionally, aggressive marketing of commercial milk formula influences women's choices regarding breastfeeding.[4,9] Two studies in South Africa have shown how companies promoted breast milk substitutes directly or digitally to healthcare workers, in several cases violating the South African regulation related to marketing of breast milk substitutes.[9,10] Therefore, a combination of interventions appears to be most effective in increasing breastfeeding rates.[7,11.]

The last few decades have witnessed a global increase in the birth and survival rates of preterm and very low birthweight (VLBW) infants, attributed to advances in prenatal and neonatal care.[12] The prevalence of VLBW infants born worldwide is estimated to be between 0.3% and 3.0% of all live births.[13] In South Africa, the VLBW prevalence is described to be around 3%.[14] Consequently, the treatment and care of this vulnerable population have gained paramount importance, as endorsed by the World Health Organization.[15,16]

Data on breastfeeding in preterm, extremely and very low birthweight infants are scarce and almost exclusively derived from high-income countries.[17–20.]

It has been shown that feeding preterm and VLBW infants human milk (either mother's own milk or pasteurised donor milk) results in a lower incidence of necrotising enterocolitis, late-onset sepsis, chronic lung disease, retinopathy of prematurity and neurodevelopmental delays.[17,18] It has also been found that the delivery of human milk is often limited for these infants due to insufficient maternal milk supply. Several interventions can increase the breast milk supply, such as early initiation of expression, increased frequency of expression, provision of kangaroo care and the establishment of a breast milk bank.[21]

Very little is known about breastfeeding among infants with very low or extremely low birthweight in Africa, including South Africa. Two studies from Uganda showed that post-discharge weight gain is slow, even with well-established kangaroo mother care and breastfeeding rates.[22] Madiba et al. (2023) found that the mothers' intention to continue breastfeeding their VLBW infants, as well as their breastfeeding efficacy and practices after discharge from the kangaroo care unit, were influenced by the skilful breastfeeding counselling, training, and support they received from the nursing staff.[23]

This study aims to provide information concerning breastfeeding rates and breastfeeding challenges in VLBW infants in a poverty-stricken region of South Africa with high rates of undernutrition in infants.

Study setting

The government-funded urban tertiary hospital in the Eastern Cape Province of South Africa serves as a neonatal and paediatric referral centre for surrounding primary healthcare clinics and district hospitals. Some referral centres are more than 300 kilometres away and located in rural and remote areas. These regions are parts of the former homelands and some of the most underprivileged areas of South Africa.

Infants born with a very low birthweight (birthweight between 1 000 and 1 500 g) as well as those born with extremely low birthweight (birthweight below 1 000 g) are often admitted for weeks and sometimes months postnatally. In accordance with the national neonatal feeding guidelines, all infants receive breast milk during their admission unless there are medical contraindications, such as infants diagnosed with galactosaemia, very sick mothers or mothers on neuroleptic medication.[24] Furthermore, during their admission, the mothers of these infants receive continuous support and extensive counselling from nurses, sisters and doctors working in neonatal wards regarding breastfeeding practices and the benefits of exclusively breastfeeding their infants for the first six months of life. There is no breast milk bank available at the hospital.

However, it has been observed that many mothers transition to formula feeding shortly after discharge from the hospital (personal finding at high-risk follow-up clinic).

Surviving infants receive follow-up care at a high-risk clinic at 1, 3, 6, 12 and 18 months, which is held weekly by a paediatrician. During these follow-up visits counselling on feeding by the doctor, dietitian or nurse took place at every meeting.

Materials and methods

This nested retrospective study was approved by the institutional ethics committee of the Walter Sisulu University. The initial study aimed to assess the mortality, growth and neurodevelopment of a cohort of VLBW infants (between 500 and 1 500 g) born in or referred within the first 24 hours of life to our neonatal high-care ward.[14,25] The recruitment period spanned from December 2017 to November 2018, during which mothers were approached for consent to include their data, as well as their infant's data, and participate in the follow-up clinic of high-risk infants at 1, 3, 6, 12 and 18 months of corrected age. The data was collected by the principal investigator at birth, at discharge from the neonatal ward and at the follow-up clinics. During routine questions about feeding practices, it was noted that many mothers had stopped breastfeeding soon after discharge, and reasons for this were sought.

Formula milk is not provided by hospitals or clinics once an infant is discharged.

Measurements

Education level was categorised as attendance at primary school only, completion of matric (12th grade) or attainment of tertiary education. Employment status of the mother was noted.

At each follow-up visit, anthropometric parameters, including weight, height and head circumference were recorded.

Exclusive breastfeeding was defined as feeding the infant only breast milk either via breastfeeding or via expressed breast milk. Mixed feeding was defined as feeding the infant both breast

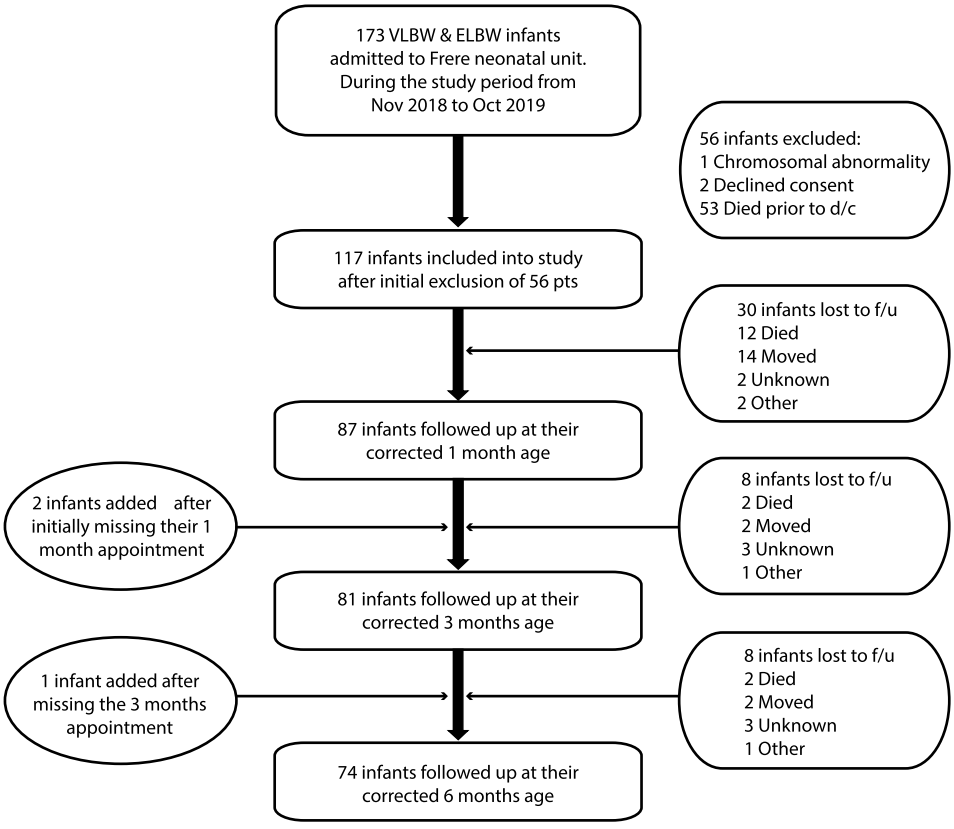

Figure 1: Infant numbers from onset of study period to six months.

milk (either breastfeeding or expressed breast milk) and any type of breast milk substitutes. Feeding breast milk substitute was defined as given only formula feeds and no breast milk at all.

Questions concerning feeding practices included whether the infant was exclusively breastfed (either via breastfeeding or expressed breast milk), and if not, what substitute feeds were used. If the infant was not breastfed, but received expressed breast milk, the volume and frequency of the breast milk were recorded. Also, if substitute milk was used (either exclusively or in combination with breast milk), questions regarding the preparation, volume and frequency of substitute milk were asked based on a 'feeding in the last 3 days' recall.

The volumes of expressed breast milk and breast milk substitutes feeds, calculated by the number of millilitres in a bottle or cup and the number of bottle or cups given in 24 hours, were recorded. Those volumes were considered incorrect if they did not match the millilitres per kilogram bodyweight per 24 hours recommended for infants of the corresponding age and weight. Caretakers were also asked about the preparation of the formula milk feeds, including the number of measuring scoops of the replacement milk powder used per bottle. The preparation was considered incorrect if the number did not match the recommendation for the specific formula milk feed the caregiver used. Other feeds included water, rooibos tea and Nestum; these were not assessed as supplements or breast milk replacement feeds, but as incorrect feeding options.

If patients missed their follow-up date, caretakers were contacted to reschedule, enquire whether they had moved, or to determine if the infant had passed away.

Table 1: Maternal demographic characteristics documented during admission

Maternal characteristic at birth		*n*	%
Maternal age	< 20	8	9%
	20–29	45	52%
	30–35	20	23%
	> 35	14	16%
Number of other children	0	29	33%
	1	39	45%
	2–4	17	20%
	> 5	2	2%
Mode of delivery	Vaginal delivery	46	53%
	Caesarean section	41	47%
Marital status	Single	34	39%
	Stable relationship	42	48%
	Married	10	11%
	Unknown	1	1%
Maternal HIV status	Negative	59	68%
	Positive	28	32%
Employment status	School/student	12	14%
	Unemployed	61	70%
	Employed	14	16%
Maternal education	Grade 12	31	36%
	Primary school only	39	45%
	Tertiary education	16	18%
	Unknown	1	1%
Total		87	100%

HIV: human immune-deficiency virus infection.

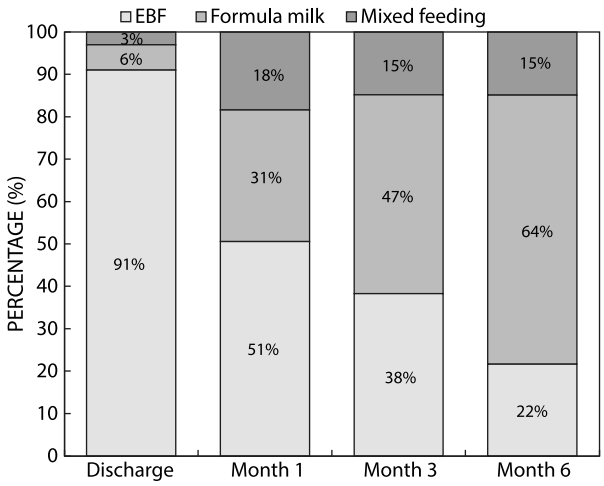

Figure 2: Percentage of different feeding choices by mothers at discharge, one, three and six months' follow-up. EBF: exclusively breastfeeding; mixed feeding: defined as any amount of breast milk and formula feeds given.

Data analysis

The data were analysed with the assistance of a statistician using Microsoft Excel (Version 2401; Microsoft Corp, Redmond, WA, USA) and Statistica (TIBCO, 2019; https://www.statsoft.de/en/data-science-applications/tibco-statistica/). Frequencies were expressed as percentages for categorical variables (e.g. exclusive breastfeeding [EBF] or non-EBF). These variables were then cross-tabulated with categorical demographic variables using the Pearson chi-square test to determine the significance of relationships at the 5% level, testing for their relation with breastfeeding status at each follow-up visit (at 1, 3 and 6 months). The effect sizes for the significant results were calculated using Cramer's V.

Results

Of the 117 participants discharged alive from the hospital, 16 (13.7%) died within the first 6 months after discharge. The number of participants who attended follow-up appointments at 1, 3 and 6 months was 87, 81 and 74, respectively (Figure 1).

For approximately 90% of the infants, their mothers remained the primary caregivers until six months of age. Maternal

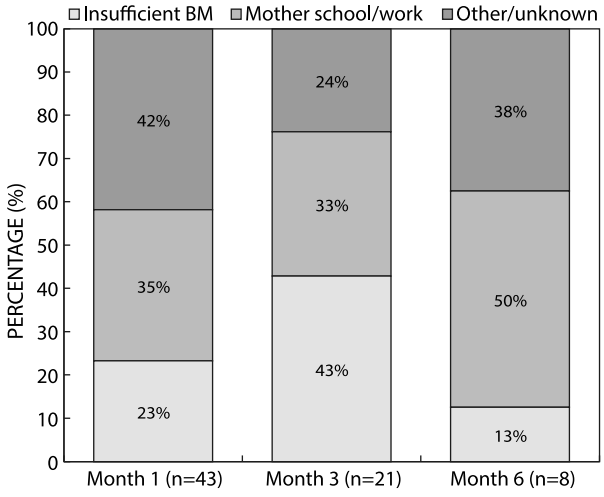

Figure 3: Percentage of reasons given by mothers for cessation of exclusive breastfeeding at one, three and six months' follow-up. EBF: exclusively breastfeeding; BM: breast milk.

Table 2: Percentages of replacement feeding choices, mixing and volumes of milk replacement feeds at one, three and six months' follow-up visits.

Volume of replacement feed	**Month 1, *n* (%)**	**Month 3, *n* (%)**	**Month 6, *n* (%)**
Correct	23 (53%)	31 (62%)	21 (36%)
Unknown	5 (12%)	2 (4%)	9 (16%)
Incorrect	15 (35%)	17(34%)	28 (48%)
Total (replacement feeds overall)	43 (100%)	50 (100%)	58 (100%)
Preparation of replacement feed			
Correct	18 (42%)	24 (48%)	25 (43%)
Unknown	9 (21%)	3 (6%)	11 (19%)
Incorrect	16 (37%)	23 (46%)	22 (38%)
Total (replacement feeds overall)	43 (100%)	50 (100%)	58 (100%)
Type of replacement feed			
Formula milk only	41 (95%)	44 (88%)	56 (97%)
Other feeds including water/ tea/Nestum infant cereal	2 (5%)	5 (10%)	2 (3%)
Unknown	(0%)	1 (2%)	(0%)
Total	43 (100%)	50 (100%)	58 (100%)

demographics revealed that of 87 mother–infant pairs, nearly half (45%) of the mothers had only one other child, and a third (33%) had no other children. Furthermore, more than a third (39%) of the mothers were single, 48% were in stable relationships and 11% were married. Regarding education and employment, 45% had attained primary school education, and 70% were unemployed. Additionally, 32% of the mothers were infected with the human immunodeficiency virus (HIV). See also Table 1.

The exclusive breastfeeding (EBF) rates decreased from 91% at discharge to 51% at 1 month, 38% at 3 months, and 22% at 6 months (Figure 2).

The main reason given for the premature cessation of exclusive breastfeeding was the mother's return to work or school (Figure 3).

More than a third (35%) of mothers who ceased exclusive breastfeeding (EBF) before the one-month corrected age follow-up had returned to work or school. By the corrected six months of age follow-up, 50% of the mothers were working or attending school again. The perception of insufficient breast milk supply as a reason to stop EBF increased from 23% at one month to 43% at the three-month follow-up. Other reasons for cessation of EBF included mothers infected with human immunodeficiency virus (HIV) who had a high viral load and/or failure of first-line antiretroviral therapy (ART), mothers claiming that their infant refused to breastfeed, mothers who decided they were unwilling to continue breast-feeding and, lastly, reasons for discontinuation that were unidentified.

The volumes of formula milk feeds calculated and recorded as in the measurement section were incorrect in over a third of cases at one and three months (35% and 34%, respectively), and in almost half of the cases at six months (48%), as shown in Table 2.

Table 3: Maternal demographic variables and their relation with successful exclusive breastfeeding

Factor	**Chi-square**	**Df**	***p*-value**	**Cramer's V effect size**	**Interpretation**
Characteristics at Month 1:					
Maternal age	4.46	1	0.035		
Number of other children	7.07	2	0.029	0.29	Medium effect
Mode of delivery	0.56	1	0.456		
Marital status	0.97	2	0.617		
Maternal HIV status	3.65	1	0.056		
Employment status of mother	0.62	2	0.732		
Maternal education	1.65	2	0.438		
Characteristics at Month 3:					
Maternal age	0.17	1	0.684		
Number of other children	5.75	2	0.056	0.27	Medium effect
Mode of delivery	0.01	1	0.941		
Marital status	1.25	2	0.537		
Maternal HIV status	0.91	1	0.340		
Employment status of mother	0.56	2	0.757		
Maternal education	10.36	2	0.006	0.36	Large effect
Characteristics at Month 6:					
Maternal age	0.76	1	0.384		
Number of other children	7.36	2	0.025	0.32	Medium effect
Mode of delivery	0.20	1	0.658		
Marital status	0.86	2	0.651		
Maternal HIV status	0.22	1	0.64		
Employment status of mother	1.03	2	0.599		
Maternal education	3.41	2	0.181		

HIV: human immune-deficiency virus infection.

Replacement milk feeds were prepared most inaccurately at the three-month follow-up, with almost half (46%) of the feeds being prepared incorrectly (Table 2). During the one- and six-month follow-ups, incorrect preparation of feeds was documented in over a third of cases (37% and 38%, respectively).

Chi-square tests of association were conducted to examine the relation between each of the seven maternal demographic variables and exclusive breastfeeding (EBF) at one, three, and six months, assessing the effect of these demographics on EBF (Table 3).

The variable 'number of other children' showed a relation with exclusive breastfeeding (EBF) at months one and six ($p = 0.029$ and 0.025, respectively), and was marginally non-significant at month three ($p = 0.056$) (see Table 3). Across all three follow-up visits, mothers with two or more other children had a higher percentage of breastfeeding compared with those with zero or one other child. According to Cramer's V effect size, this relation demonstrated medium strength consistently across all visits.

Maternal education level was related to EBF only at month three ($p = 0.006$). The percentage of breastfeeding mothers was highest among those with primary school education, followed by Grade 12, and lowest among those with tertiary education (57%, 31% and 13%, respectively). Cramer's V indicated a strong relation between maternal education level and EBF at month three.

Discussion

The primary objective of this study was to assess the prevalence of exclusive breastfeeding (EBF) among very low birthweight (VLBW) and extremely low birthweight (ELBW) infants at six months' corrected age. Consistent with findings from a local systematic review by du Plessis et al. (2016) regarding all infants in South Africa, 91% of our study cohort initiated EBF at birth, but only 22% continued exclusively breastfeeding until six months of corrected age.[5] This rate is lower compared with the 32% reported by Goon et al. (2021) in a different cohort of infants of any birthweight born to HIV-infected mothers in the Prevention of Mother to Child Transmission (PMTCT) programme within the same setting.[7] These figures highlight suboptimal EBF rates in our study population, falling below both the global rate of 44% and the WHO's target of 50% by 2025, and are similar to breastfeeding rates for normal weight infants in South Africa.[6,26]

Various factors influence maternal decisions regarding feeding practices and cessation of feeding breast milk after discharge from hospital. In our study, selected variables impacting EBF align with findings from similar studies globally and within South Africa.[7,8,27] Over a third of mothers in our study returned to work or school before their infants reached one month corrected age. The early cessation of EBF due to maternal work or school commitments of any infant is well researched and has been observed in both affluent populations and resource-constrained regions.[7,27] These findings suggest that efforts to support mothers in maintaining breastfeeding while working have not yet had the hoped-for impact.

Interestingly, perceived insufficient breast milk supply emerged as the second most common contributor to declining EBF rates post-discharge, echoing findings in South Africa and globally across various infant populations – term, preterm, with normal or low birthweights – under six months of age.[4,8] Notably, despite successful breastfeeding for weeks and sometimes months during hospitalisation, many mothers in our study faced challenges sustaining breastfeeding at home, maybe due to inadequate family and community support. A recent study following preterm babies discharged from a neonatal intensive care unit (NICU) in Denmark found that 50% of mothers terminated the recommended six months' exclusive breastfeeding early, due to concerns regarding insufficient milk supply.[28] Community-based promotion and support have been identified as crucial components in ensuring exclusive breast milk feeding for the first six months of life, regardless of infant birthweight.[29] Implementing programmes with trained community health workers in townships could provide essential support to maintain breastfeeding among this vulnerable population.

Regarding replacement feeds, more than a third were prepared incorrectly (incorrect milk powder/water ratio) across all follow-ups, with inaccurate volumes provided to half of the infants at the six-month review. Such practices expose infants to such risks as malnutrition, electrolyte imbalances, gastrointestinal issues and infections.[27] Furthermore, infants receiving other feeds such as water, tea and infant cereals like Nestum pose additional health risks.[1,4,17] Almost 14% of infants (16 out of 117) died after discharge within their corrected first 6 months of life. It would be crucial to investigate how many deaths were related to feeding issues to improve post-discharge care.[25]

The study also explored the relationship between EBF and seven maternal sociodemographic variables: maternal age, number of other children, mode of delivery, marital status, maternal HIV status, employment status and maternal education level. A relation was seen between number of other children at months one and six, with higher EBF prevalence among mothers with two or more children and with lower maternal education level. Possible reasons for this, such as breastfeeding success with previous children or better education and support with the study infant, were not investigated. Mothers with lower education levels were more likely to continue exclusively breastfeeding up to six months of age. Both patterns have been observed in the same setting, as well as globally.[7,30]

Limitations of the study

This study was conducted at a single centre in Eastern Cape province of South Africa, which limits the generalizability of the findings to other settings. Additionally, the small sample size and high dropout rate in the study may have introduced bias, possibly skewing the data. Furthermore, because the data were originally collected as part of a study on growth and neurodevelopmental outcomes in VLBW infants, crucial questions regarding breastfeeding may not have been explored.

Caution should be exercised when extrapolating these findings to broader populations or different healthcare contexts. Future research with larger sample sizes and more diverse settings would be beneficial to validate and extend the findings of this study.

Conclusion

This descriptive study evaluates feeding practices among VLBW and ELBW infants in a resource-limited setting. It reveals a low

prevalence of EBF among these infants up to six months of age. Additionally, a significant proportion of replacement feeds were given with incorrect volumes, and/or improper preparation (milk powder/water ratio).

Reasons given for early cessation of EBF identified in the study included maternal commitments to work or school and maternal perceptions of insufficient breast milk supply. It seems that mothers who successfully breastfed their infants during extended hospital stays encountered difficulties in maintaining EBF soon after being discharged home. Thus, the struggle faced by mothers of VLBW infants in low-resource settings to maintain successful exclusive breastfeeding for the first six months of life is similar to the experience of mothers who did not receive hospital support for weeks or months after giving birth. This study highlights the need for targeted home and community interventions to support exclusive breastfeeding practices among discharged infants in resource-limited settings.

Consent for publication – Participants' legal guardians were informed about the publication of study results.

Funding – This work was supported by the South African Medical Research Council (SAMRC) Fund. The sponsorship of the SAMRC Pilot Grant serves to encourage clinicians in rural South Africa to engage in research.

Disclosure statement – No potential conflict of interest was reported by the authors.

Data availability statement – Raw data supporting study conclusions will be made available by the authors.

ORCID

IA Michaelis http://orcid.org/0000-0002-5073-5545

References

1. Hamer DH, Solomon H, Das G, et al. Importance of breastfeeding and complementary feeding for management and prevention of childhood diarrhoea in low-and middle-income countries. J Glob Health. 2022;12:10010. https://doi.org/10.7189/jogh.12.10011
2. Victora CG, Bahl R, Barros AJD, et al. Breastfeeding in the 21st century: epidemiology, mechanisms, and lifelong effect. Lancet. 2016;387(10017):475–90. https://doi.org/10.1016/S0140-6736(15)01024-7
3. Martin-Wiesner P. A policy-friendly environment for breastfeeding. In: A review of South Africa's progress in systematising its international and national responsibilities to protect, promote and support breastfeeding. DST-NRF Centre of Excellence in Human Development, University of Witwatersrand, Johannesburg, South Africa; 2018; 84 p.
4. Pérez-Escamilla R, Tomori C, Hernández-Cordero S, et al. Breastfeeding: crucially important, but increasingly challenged in a market-driven world. Lancet. 2023;401(10375):472–85. https://doi.org/10.1016/S0140-6736(22)01932-8
5. Du Plessis L, Peer N, English R, et al. Breastfeeding in South Africa: are we making progress? South African Health Review. 2016;2016(1):109–23.
6. Nieuwoudt SJ, Ngandu CB, Manderson L, et al. Exclusive breastfeeding policy, practice and influences in South Africa, 1980 to 2018: A mixed-methods systematic review. PLoS One. 2019;14(10):e0224029. https://doi.org/10.1371/journal.pone.0224029
7. Goon DT, Ajayi AI, Adeniyi OV. Sociodemographic and lifestyle correlates of exclusive breastfeeding practices among mothers on antiretroviral therapy in the Eastern Cape, South Africa. Int Breastfeed J. 2021;16:1–9. https://doi.org/10.1186/s13006-020-00354-0
8. Siziba L, Jerling J, Hanekom S, et al. Low rates of exclusive breastfeeding are still evident in four South African provinces. South Afr J Clini Nutrit. 2015;28(4):170–9. https://doi.org/10.1080/16070658.2015.11734557
9. Jones A, Bhaumik S, Morelli G, et al. Digital marketing of breast-milk substitutes: a systematic scoping review. Curr Nutr Rep. 2022;11(3):416–30. https://doi.org/10.1007/s13668-022-00414-3
10. Doherty T, Pereira-Kotze CJ, Luthuli S, et al. They push their products through me: health professionals' perspectives on and exposure to marketing of commercial milk formula in Cape Town and Johannesburg, South Africa–a qualitative study. BMJ Open. 2022;12(4):e055872. https://doi.org/10.1136/bmjopen-2021-055872
11. Parker LA, Desorcy-Scherer K, Magalhães M. Feeding strategies in preterm very low birth-weight infants: state-of-the-science review. Adv Neonatal Care. 2021;21(6):493–502. https://doi.org/10.1097/ANC.0000000000000849
12. Bansal A. Comparison of outcome of very-low-birth-weight babies with developed countries: a prospective longitudinal observational study. J Clin Neonatol. 2018;7(4):254–8. https://doi.org/10.4103/jcn.JCN_76_18
13. Marete I, Ekhaguere O, Bann CM, et al. Regional trends in birth weight in low-and middle-income countries 2013–2018. Reprod Health. 2020;17:1–8. https://doi.org/10.1186/s12978-020-01026-2
14. Michaelis IA, Krägeloh-Mann I, Manyisane N, et al. Prospective cohort study of mortality in very low birthweight infants in a single centre in the eastern cape province, South Africa. BMJ Paediatrics Open. 2021;5(1):1–7. https://doi.org/10.1136/bmjpo-2020-000918
15. World Health Organization and the United Nations Children's Fund, Nutrition and food safety. Implementation guidance: protecting, promoting and supporting breastfeeding in facilities providing maternity and newborn services–the revised baby-friendly hospital initiative. Geneva: World Health Organization; 2018.
16. Spatz DL. Ten steps for promoting and protecting breastfeeding for vulnerable infants. J Perinat Neonatal Nurs. 2004;18(4):385–96. [Online]. Available from: https://journals.lww.com/jpnnjournal/fulltext/2004/10000/ten_steps_for_promoting_and_protecting.9.aspx. https://doi.org/10.1097/00005237-200410000-00009
17. Miller J, Tonkin E, Damarell RA, et al. A systematic review and meta-analysis of human milk feeding and morbidity in very low birth weight infants. Nutrients. 2018;10(6):707. https://doi.org/10.3390/nu10060707
18. Parker MG, Stellwagen Lisa M. Noble Lawrence Kim Jae H. Poindexter Brenda B. Puopolo Karen M. Promoting human milk and breastfeeding for the very low birth weight infant. Pediatrics. 2021;148(5):1–15. https://doi.org/10.1542/peds.2021-054272
19. Quitadamo PA, et al. Might the mothers of premature babies feed them and devote some milk to the milk bank? Int J Pediatr. 2018;2018(1):3628952.
20. Campbell AG, Miranda PY. Breastfeeding trends among very low birth weight, low birth weight, and normal birth weight infants. J Pediatr. 2018;200:71–8. https://doi.org/10.1016/j.jpeds.2018.04.039
21. Parker LA, Sullivan S, Krueger C, et al. Strategies to increase milk volume in mothers of VLBW infants. MCN: Am J Mater/Child Nur. 2013;38(6):385–90. https://doi.org/10.1097/NMC.0b013e3182a1fc2f
22. Namiiro FB, Mugalu J, McAdams RM, et al. Poor birth weight recovery among low birth weight/preterm infants following hospital discharge in Kampala, Uganda. BMC Pregnancy Childbirth. 2012;12:1–7. https://doi.org/10.1186/1471-2393-12-1
23. Madiba S, Modjadji P, Ntuli B. "Breastfeeding at night Is awesome" mothers' intentions of continuation of breastfeeding extreme and very preterm babies upon discharge from a kangaroo mother care unit of a tertiary hospital in South Africa. Healthcare. 2023;11(7: MDPI):1048. https://doi.org/10.3390/healthcare11071048
24. S. A. Government. "Infant and young child feeding policy."2025 [cited 2025 Jan 19] https://www.gov.za/sites/default/files/gcis_document/201409/infantfeed.pdf.
25. Michaelis IA, Krägeloh-Mann I, Mazinu M, et al. Growth of a cohort of very low birth weight and preterm infants born at a single tertiary health care center in South Africa. Front Pediatr. 2023;10:1075645. https://doi.org/10.3389/fped.2022.1075645

26. North K, Gao M, Allen G, et al. Breastfeeding in a global context: epidemiology, impact, and future directions. Clin Ther. 2022;44(2):228–44. https://doi.org/10.1016/j.clinthera.2021.11.017
27. Olalere O, Harley C. Why women discontinue exclusive breastfeeding: a scoping review. Br J Midwifery. 2024;32(12):673–82. https://doi.org/10.12968/bjom.2024.0044
28. Skaaning D, Brødsgaard A, Kronborg H, et al. Maternal reasons for early termination of exclusive breastfeeding in premature infants: a prospective study. J Perinat Neonatal Nurs. 2024;38(1):88–97. https://doi.org/10.1097/JPN.0000000000000693
29. Lutter CK, Morrow AL. Protection, promotion, and support and global trends in breastfeeding. Advances in Nutrition. 2013;4(2):213–9. https://doi.org/10.3945/an.112.003111
30. Neves PA, Barros AJ, Gatica-Domínguez G, et al. Maternal education and equity in breastfeeding: trends and patterns in 81 low-and middle-income countries between 2000 and 2019. Int J Equity Health. 2021;20:1–13. https://doi.org/10.1186/s12939-020-01357-3

Received: 18-06-2024 Accepted: 24-01-2025