Maternal Care Practices for Preterm Infants after Discharge from Two Teaching Hospitals in Port Harcourt, Nigeria: A Mixed-Methods Approach

ELVORAH WILSON OPOTO, MSN[1], DAPRIM SAMUEL OGAJI, PHD[2], ELSIE OSOSESE UGEGE, PHD[3], PROF. PEACE OPARA[4]

[1]*Department of Child Health, Africa Centre for Public Health and Toxicological Research, University of Port Harcourt, Choba, Nigeria.*

[2]*Department of Social & Preventive Medicine, Africa Centre for Public Health and Toxicological Research, University of Port Harcourt, Choba, Nigeria.*

[3]*Department of Child Health, Africa Centre for Public Health and Toxicological Research, University of Port Harcourt, Choba, Nigeria.*

Abstract- ***Preterm infants require specialized care following discharge from the Special Care Baby Unit (SCBU). Mothers are expected to learn and practice thermal care (Kangaroo Mother Care, KMC), exclusive breastfeeding (EBF), hand hygiene (infection control), and growth monitoring/vigilance. However, there is scarcity of evidence on the practices by mothers in specific geographical and cultural contexts.***

Aim: To examine maternal care practices for preterm infants at 3- and 6-months post-discharge from SCBUs in two teaching hospitals in Port Harcourt.

Methods: A convergent parallel mixed-method design was employed. The qualitative arm included 30 mothers, selected via purposive sampling, while the quantitative arm followed 170 mother-infant pairs using consecutive sampling. Data were collected through interviews and a validated self-report questionnaire (r = 0.81). Thematic content analysis (Hsieh & Shannon approach) was used for qualitative data, while descriptive and chi-square statistics (5% significance level) were applied to quantitative data using NVivo and SPSS 25, respectively.

Results: Fifteen themes and 46 subthemes emerged from qualitative analysis. Between 3- and 6-months post-discharge, EBF declined significantly from 97.0% to 77.7%, KMC from 68.9% to 39.2%, and hand hygiene from 92.2% to 41.6%, while growth monitoring remained stable. EBF reduced morbidity risk by 92% (RR = 0.08, p < 0.001), and weekly growth monitoring reduced risk by 87% (RR = 0.13, p = 0.002).

Conclusion: Maternal adherence to EBF, KMC, and hand hygiene declined significantly by 6 months post-discharge. Strengthening public health education is essential to sustain optimal preterm infant care practices.

MeSH Keywords: Breast Feeding, Hand Hygiene, Infant, Kangaroo-Mother Care Method, Mothers, Premature

I. INTRODUCTION

Preterm birth refers to delivery before the 37th gestational week (Nnagbo et al., 2024). It remains a pressing public health issue in low- and middle-income countries (LMICs) where it significantly contributes to neonatal morbidity and mortality (Mustapha et al., 2020). Sub-Saharan Africa and Asia account for approximately 60% of the 15 million annual global preterm births (Maluni et al., 2025). Furthermore, an estimated 20.6% of these infants die at home after discharge from the Special Care Baby Unit (SCBU) (Nsubuga et al., 2024). This concerning statistic highlights the urgent need for effective maternal care practices following discharge from hospital, to enhance the survival and well-being of preterm infants.

Limited maternal education, inadequate support systems, and restricted access to postnatal healthcare services in LMICs further exacerbate post-discharge mortality rates for preterm babies (Knappett et al., 2024). Due to their underdeveloped physiological

systems, preterm infants are highly vulnerable to infections, malnutrition, and hypothermia (Yuan et al., 2024). These risks intensify once hospital-based care ceases, placing immense responsibility on mothers to ensure their infants' survival through appropriate caregiving.

Maternal care for preterm infants is a critical area of midwifery research, as mothers assume the primary caregiving role post-discharg e (Fernandez-Turienzo et al., 2021). Quality maternal care is essential for maintaining thermal regulation, ensuring adequate nutrition, preventing infections, and sustaining vigilant monitoring (Garti et al., 2021). Despite hospital interventions designed to equip mothers with essential caregiving skills, the quality of post-discharge care often deteriorates due to socioeconomic constraints, cultural influences, and emotional stress (Adu-Bonsaffoh et al., 2020). Studies indicate that certain traditional practices, such as feeding infants with glucose water or applying non-sterile substances to the umbilical stump, persist in some African settings, potentially jeopardizing infant health (Adama et al., 2020; Udeogalanya et al., 2023).

SCBUs provide critical care for preterm infants, offering mothers the opportunity to receive training in Kangaroo Mother Care (KMC), exclusive breastfeeding (EBF), hygiene, and growth monitoring (Esewe & Phetlhu, 2022; Johnson, 2024). However, adherence to these recommended practices after discharge remains suboptimal (Kalito et al., 2024). Several factors, including maternal emotional distress, financial constraints, limited healthcare access, and strong socio-cultural influences, contribute to deviations from optimal care practices (Esewe & Phetlhu, 2022). Evidence suggests a significant decline in key maternal care behaviours such as EBF, KMC, hand hygiene, and growth monitoring within six months post-discharge, thereby increasing the risk of morbidity and mortality (Adama et al., 2020; Agbeno et al., 2021).

Nigeria records a high prevalence of preterm births at 16.9%, alongside a significant neonatal mortality burden exacerbated by inadequate post-discharge care (Nnagbo et al., 2024). Preventable complications and adverse developmental outcomes further underscore the importance of effective maternal care. However, limited research has explored maternal care practices for preterm infants following hospital discharge in Nigeria, particularly in Port Harcourt. Most existing related studies have relied on quantitative methodologies, which, while valuable for statistical analysis, do not fully capture maternal experiences or the socio-cultural factors influencing caregiving practices.

A literature search across major academic databases including PubMed, Scopus, EBSCO, ProQuest, and Google Scholar revealed a paucity of Nigeria-based studies investigating post-discharge maternal care practices (Opoto et al., 2024). While quantitative research provides essential epidemiological insights, qualitative approaches will offer a deeper understanding of maternal perspectives, challenges, and decision-making processes (Mörelius et al., 2020). The limited qualitative studies available predominantly focus on hospital-based care, with minimal exploration of home-based caregiving practices. Furthermore, most existing research has been conducted outside Port Harcourt, underscoring a significant gap in localized evidence.

Port Harcourt, an urban metropolis in southern Nigeria, hosts two public teaching hospitals with SCBU services. The city's diverse cultural landscape influences maternal caregiving behaviours, necessitating localized research to identify context-specific challenges and solutions. The researcher's familiarity with the region's customs, social myths, and traditions enhances the study's cultural relevance, facilitating a nuanced understanding of maternal care practices in this setting.

This study examined maternal care practices for preterm infants at 3- and 6-months post-discharge from SCBUs in two teaching hospitals in Port Harcourt.

II. METHODS

Study Design

This study employed a two-phase convergent parallel mixed-methods design comprising a cross-sectional qualitative study and a prospective longitudinal quantitative study. The qualitative phase explored maternal experiences and caregiving practices post-

discharge, while the quantitative phase examined maternal adherence to recommended care practices and associated infant health outcomes over time.

Ethical Considerations

The study adhered strictly to the ethical principles outlined in the Declaration of Helsinki (2013). Ethical approval was obtained from the University of Port Harcourt Institutional Review Board (IRB, Approval ID: UPH/CEREMAD/REC/MM98/014). All participants provided informed consent before participation, with assurances of confidentiality and the right to withdraw at any stage without repercussions.

Study Population and Sample Size

The study population comprised 239 mother-preterm infant pairs, determined by summing the SCBU admission statistics from the University of Port Harcourt Teaching Hospital (UPTH) (n = 142) and the Rivers State University Teaching Hospital (RSUTH) (n = 97).

For the qualitative phase, a purposive sample of 30 mothers was selected, with data saturation guiding the final sample size. The quantitative phase utilized a sample of 170 mothers, determined using Cochran's Power Analysis Formula for Descriptive Studies (Charan & Biswas, 2013):

$n = [(Z + power)2 \times P(1-P)] \div e2$.

Where: Z (normal distribution constant at a power of 80%) = 1.96; Power = 0.84; P (Prevalence of preterm birth in the Niger Delta) = 16% (Zini & Omo-Aghoja, 2019); e (Precision of error at 95% Confidence) = 5%. A minimum sample size of 422 was computed. Given the estimated population was less than 10,000, sample size adjustment using the Finite Population Correction formula (Bolarinwa, 2020) yielded a corrected sample size of 153. An additional 10% attrition correction was applied, resulting in a final sample size of 170.

Sampling Technique

The qualitative phase employed purposive sampling technique to select participants with diverse caregiving experiences, while the quantitative phase utilized consecutive sampling, enrolling all eligible mother-preterm infant pairs discharged from UPTH and RSUTH during the study period.

Inclusion and Exclusion Criteria

The study included Mothers of preterm infants discharged from the SCBU of UPTH and RSUTH who are, Rresidents in Port Harcourt, and have a functional telephone number and/or email address.

The study excluded mMothers who did not understand Nigerian Pidgin English and Mothers of preterm infants with congenital abnormalities.

Data Collection

Data collection was conducted in two phases:

In Phase 1 (Qualitative arm of the study), three months post-discharge, in-depth telephone interviews were conducted with each participant, guided by a structured interview guide. The interviews, lasting 40–45 minutes, explored maternal practices related to preterm infant feeding, temperature control, infection prevention, and growth monitoring. Interviews were audio-recorded using an Infinix Smart 5 smartphone with built-in voice recording functionality. Participants also completed a web-based self-report questionnaire via Google Forms.

In Phase 2 (Quantitative arm of the study), data were collected at 3- and 6-months post-discharge using self-report questionnaires (available in both paper-based and web-based formats). Participants selected their preferred format based on accessibility. The questionnaire covered socio-demographic characteristics, preterm infant feeding, temperature control, infection prevention, vigilance practices, and preterm health outcomes (e.g., weight, length, hospitalization, morbidity symptoms, and mortality).

The self-report questionnaire incorporated standardized and researcher-developed instruments: (1) Infant Feeding Questionnaire (Baughcum et al., 2001) to assess feeding practices; (2) Thermal Care Inventory (Nyandiko et al., 2021) to evaluate temperature regulation practices; (3) Infant Infection Prevention Questionnaire (Dawczynski et al., 2016) to measure infection prevention practices; and (4) Researcher-designed vigilance and growth monitoring scale.

The questionnaire comprised 11 sections (A–K), covering demographic characteristics (Section A), infant feeding (Section B), temperature regulation (Section C), infection prevention (Section D), growth

monitoring and vigilance practices (Section E), and preterm health outcomes (Section F), with additional sections for specific caregiving domains.

Data Analysis

Qualitative data were analyzed using content analysis, guided by Hsieh and Shannon's (2005) five-step approach: (1) Organizing and transcribing audio recordings; (2) Reviewing and validating transcripts, (3) Developing a coding framework, (4) Identifying themes and subthemes, and (5) Presenting findings in a cohesive manner. The qualitative data were managed using NVivo software.

Quantitative data were analyzed using SPSS version 25 (IBM, Armonk). Descriptive statistics (mean, standard deviation, frequency, and percentages) were used to summarize demographic and caregiving variables. Hypothesis testing was conducted using chi-square inferential statistics and relative risk analysis at a 5% significance level (95% confidence interval).

III. RESULTS

Table 1 presents the demographic characteristics of 30 respondents (PW01–PW30), detailing their age (29–41 years), parity (1–3 births), educational attainment (primary to tertiary), and occupation. The participants represent diverse backgrounds, including civil servants, artisans, traders, and farmers.

Table 2 details the socio-demographic characteristics of 170 mother-preterm infant pairs. The mothers had a mean age of 33.50 years, with most of them aged 30–39 years and nearly half were first-time mothers. Half of them had secondary education, and were more of traders. Most of the mother-preterm infant pairs were born between 35–36 weeks, with an average birth weight of 2.19 kg, and length of 43.43 cm, and were discharged from UPTH. While most of the mothers reported no morbidities and never used tobacco, most of the infants experienced respiratory distress.

Table 3 presents the themes and subthemes generated on mothers' strategies concerning proper nutrition and temperature regulation for their infants. They assessed their baby's nutrition by observing feeding behaviours, monitoring weight gain, and following medical advice on feeding schedules. Strategies for feeding include adjusting feeding positions, ensuring burping after meals, and creating a calm feeding environment to enhance comfort. Challenges such as difficulty with sucking, swallowing, or refusal to feed require careful observation and consultation with healthcare providers. In terms of temperature regulation, mothers ensured room comfort by maintaining appropriate room temperatures, dressing infants appropriately, and using suitable bedding. They also regulate ambient temperature by monitoring it with thermometers, controlling airflow, and insulating the room for stability. Some caregivers relied on thermal support equipment such as warming pads, warm blankets, and even body heat to maintain optimal warmth for their infants.

Table 4 presents themes and subthemes generated from information regarding mothers' strategies in maintaining hygiene, growth monitoring/vigilance, and the socio-cultural challenges they encounter. Mothers prioritized hygiene by maintaining strict hand washing practices before handling their babies and enforcing hygiene rules for visitors, including providing hand sanitizers and visual reminders. They also emphasized proper umbilical stump care through hand hygiene, gentle cleaning, preventing friction, and recognizing signs of infection. Growth monitoring is a key concern, as mothers tracked weight, length, and head circumference while observing developmental milestones. They maintained vigilance and growth monitoring with various equipments equipment, such as baby scales, measuring tapes, and growth charts. Mothers noted both positive growth outcomes, such as steady weight gain and social development, and challenges, like sleep struggles. Socio-cultural barriers to preterm infant care include stigma and misconceptions about preterm birth, leading to feelings of isolation. Additionally, cultural beliefs sometimes conflicted with medical recommendations, and lack of support from family and friends further complicated caregiving efforts.

Table 5 presents changes in preterm infant care practices among mothers of preterm infants and revealed that from 3 months follow-up to 6 months follow-up, exclusive breastfeeding, skin-to-skin kangaroo care, and hand washing before and after changing diapers significantly declined ($p < 0.001$). In contrast, the frequency of monitoring infant weight

and length remained relatively stable between the two follow-ups ($p = 0.213$).

Table 6 presents a chi square test of association between infant care practices and morbidity at 6 Months Follow-Up. It demonstrated that Exclusive breastfeeding and frequent growth monitoring showed significant associations with lower morbidity among preterm infants at six months ($p < 0.001$ and $p = 0.002$, respectively). Infants exclusively breastfed had a 92% reduced risk of morbidity (RR = 0.08, 95% CI: 0.02–0.38), while those monitored weekly for growth had an 87% lower risk of morbidity compared to those monitored monthly (RR = 0.13, 95% CI: 0.03–0.62). In contrast, handwashing before and after diaper changes and frequent skin-to-skin contact were not significantly associated with morbidity ($p > 0.05$).

IV. DISCUSSION

This study identified 15 themes and 46 subthemes of EBF, KMC, growth monitoring, and hygiene. with a focus on feeding practices for preterm infants. Key subthemes included assessing nutritional needs, strategizing for infant feeding, adjusting feeding regimens, and addressing challenges. Nutritional assessment involves evaluating the infant's specific needs, considering factors like gestational age, weight, and medical conditions. Strategies for feeding prioritize breastfeeding, but when direct breastfeeding isn't possible, alternatives like breast milk fortifiers or specialized formulas may be used. Feeding regimens are flexible and adjusted based on the infant's growth and tolerance, with regular monitoring to ensure steady development. Challenges in feeding preterm infants include issues like poor sucking reflexes or fatigue, which require targeted interventions such as specialized feeding equipment or positions. Parental education and emotional support are vital to managing these complexities and ensuring proper nutrition for the infant’s growth and health. Regular follow-ups with healthcare providers ensure timely adjustments to feeding plans. This finding aligns with Hagi-Pedersen et al. (2022) and Jiang and Jiang (2022)

The study identified key temperature regulation practices for preterm infants, focusing on strategies for regulating body temperature, managing ambient temperature, and using thermal support equipment. Preterm infants' underdeveloped thermoregulation systems make them vulnerable to temperature fluctuations. Mothers applied strategies for managing room temperature, using warming pads, and practicing kangaroo care. This finding aligns with Maastrup et al. (2021).

This study noted that the mothers employed hand hygiene when changing diapers. This finding was essential to prevent infections. Studies by Celebi-Celik et al. (2021) and López-Medina et al. (2020) highlight the importance of cleaning and monitoring for signs of infection. Healthcare guidelines recommend using cleaning agents like chlorhexidine or dry cord care (Shwe et al., 2021). However, the study identified socio-cultural challenges mothers face in home-based care for preterm infants, lack of support, stigma, and conflict between cultural beliefs and medical advice. Stigma arises from misconceptions about preterm birth in semi-rural African communities, where preterm infants are often misunderstood, leading to social isolation. Cultural beliefs, such as viewing preterm birth as a maternal fault or divine punishment, further stigmatize mothers. These beliefs, combined with societal pressures regarding infant health, make mothers feel blamed and ashamed. The fear of judgment prevents mothers from seeking proper resources or assistance, complicating the care and well-being of their preterm infants.

This study found that between 3- and 6-months post-discharge, EBF, KMC, and hand hygiene declined significantly. This could be due to the idea that as the infant grow; parents may face increasing challenges such as returning to work, managing household responsibilities, or dealing with the infant's changing needs. These factors can limit the time and energy available to consistently maintain practices like EBF, KMC, and hand hygiene, leading to a decline in their implementation. This finding aligns with Hagi-Pedersen et al. (2022), who reported that after discharge, exclusive breastfeeding fell from 66% to 55%. Although the level of exclusive breastfeeding was below that found in this study, the similarity in the decline in exclusive breastfeeding between this study's result and that of Hagi-Pedersen et al. (2022) can be attributed to the design of the studies. Both this study and Hagi-Pedersen et al. (2022) involved short-term follow-up studies. The findings of this study align with

Getie et al. (2022) who KMC knowledge and practice among mothers of preterm or low birth weight babies at referral hospitals in North West Ethiopia and found that about 41.3% of the nursing mothers continued KMC after discharge from the SCBU. Both studies show a significant drop in KMC practice over time. The 41.3% continuation rate in Getie et al. (2022) is comparable to the 39.2% reported at 6 months in this study. This similarity suggests that despite initial high adherence, maintaining KMC can be challenging as time progresses, possibly due to practical difficulties and changing perceptions of its necessity as infants grow.

This study revealed that EBF and weekly growth monitoring significantly reduced morbidity risk. An explanation for this finding is that EBF provides optimal nutrition tailored to the infant's needs, including essential antibodies and nutrients. This boosts the infant's immune system, reduces the risk of infections, and supports overall growth and development, thereby lowering morbidity risk. Additionally, weekly growth monitoring enables early identification of any potential health issues, such as inadequate weight gain or signs of malnutrition. This allows for timely interventions and adjustments to care, preventing the escalation of health problems and reducing the risk of complications. This finding aligns with the study's finding aligns with Charpak et al. (2021) that highlights the protective effects of EBF, KMC, and Vigilance. Charpak et al. (2021) demonstrated that EBF and vigilance leads to lower rates of health complications and improved weight gain in preterm infants. These outcomes collectively contribute to a reduced risk of morbidity, supporting the assertion that practicing EBF often can have profound health benefits. Furthermore, Sivanandan and Sankar (2023) documented that infants who receive EBF and vigilance have more stable heart rates and respiratory patterns, and gain weight more rapidly than those who do not receive such care.

Limitation

The reliance on self-reported data from mothers regarding their practices and the health outcomes of their infants introduces the possibility of reporting bias. Mothers may overestimate or underestimate their adherence to recommended practices or the health status of their infants due to recall bias or social desirability bias. Utilizing objective measures and healthcare provider reports in future research could help mitigate these biases and provide more accurate data.

CONCLUSION AND RECOMMENDATIONS

This study provides critical insights into the impact of various maternal care practices on the health outcomes of preterm infants at 3-month and 6-month follow-up periods. Key findings indicate that growth monitoring, exclusive breastfeeding, and Kangaroo Care significantly reduced over time. Growth monitoring and exclusive breastfeeding significantly reduced the risk of morbidity among preterm infants.

Healthcare providers should emphasize the importance of regular growth monitoring and exclusive breast feeding for preterm infants. Enhancing public health education is crucial for maintaining effective care practices for preterm infantsAvailability of Data and Materials: The data that support the findings of this study are available on request from the corresponding author.

Ethics Committee Approval: Ethics committee approval was received for this study from the University of Port Harcourt IRB (Approval ID: UPH/CEREMAD/REC/MM98/014).

Informed Consent: Written informed consent was obtained from the mothers of the infants who participated in this study.

Author Contributions: Concept – E.W.O.; Design – D.S.O., E.O.U, P. O; Supervision – D.S.O., E.O.U, P.O; Resources – E.W.O.; Materials – E.W.O.; Data Collection and/or Processing – E.W.O.; Analysis and/or Interpretation – E.W.O., D.S.O., E.O.U, P.O.; Literature Search – E.O.U.; Writing Manuscript – E.W.O.; Critical Review – D.S.O., E.O.U., P.O.

Declaration of Interests: The authors have no conflict of interest to
declare.

Funding: The authors declared that this study has received no financial support

REFERENCES

[1] Adama, E., Sundin, D., & Bayes, S. (2020). Sociocultural practices affecting the care of preterm infants in the Ghanaian Community. *Journal of Transcultural Nursing*, 2020(1), 1043659620975098.

[2] Adu-Bonsaffoh, K., Oppong, S., Dassah, E., & Seffah, J. (2020). Challenges in preterm birth research: Ghanaian perspective. *Placenta*, 98(1), 24–28.

[3] Agbeno, E., Osarfo, J., Ashong, J., Anane-Fenin, B., Okai, E., Ofori, A., & Soltani, H. (2021). Determinants of preterm survival in a teaching hospital in Ghana: A ten-year review. *PLOS ONE*, 16(1), e0246005.

[4] Baughcum, A., Powers, S., Johnson, S., Chamberlin, L. A., Deeks, C., Jain, A., & Whitaker, R. (2001). Maternal feeding practices and beliefs and their relationships to overweight in early childhood. *Journal of Developmental & Behavioural Pediatrics*, 22(6), 391-408.

[5] Bolarinwa, O. (2020). Sample size estimation for health and social science researchers: The principles and considerations for different study designs. *Nigeria Postgraduate Medical Journal*, *27*(1), 67-75.

[6] Celebi-Celik, F., Tuzun, F., Duman, N., Keskinoglu, P., Kumral, A., & Ozkan, H. (2021). Current factors affecting the risk of omphalitis in newborns: A prospective case-control study. *International Journal of Clinical Practice*, *75*(5), e14071.

[7] Charan, J., & Biswas, T. (2013). How to calculate sample size for different study designs in medical research. *Indian Journal of Psychological Medicine*, *35*(2), 121-126. https://doi.org/10.4103/0253-7176.116232.

[8] Charpak, N., Montealegre-Pomar, A., & Bohorquez, A. (2021). Systematic review and meta-analysis suggest that the duration of Kangaroo mother care has a direct impact on neonatal growth. *Acta Paediatrica*, *110*(1), 45-59.

[9] Dawczynski, K., Schleussner, E., Dobermann, H., & Proquitte, H. (2016). Infection prevention in premature infants and newborns in Thuringia: implementation of recommendation of the commission for hospital hygiene and infection prevention (KRINKO). *Zeitschrift fur Geburtshilfe und Neonatologie*, 221(1), 30-38.

[10] Esewe, R. E., & Phetlhu, R. D. (2022). Challenges of uptake of kangaroo mother care by parents of preterm and low birth weight infants in Edo State, Nigeria. African Journal of Reproductive Health, 26(2), 68-79.

[11] Fernandez-Turienzo, C., Silverio, S. A., Coxon, K., Brigante, L., Seed, P. T., Shennan, A. H., ... & POPPIE Collaborative Group. (2021). Experiences of maternity care among women at increased risk of preterm birth receiving midwifery continuity of care compared to women receiving standard care: Results from the POPPIE pilot trial. PloS one, 16(4), e0248588.

[12] Garti, I., Donkor, E., Musah, N., Appiah, E., Gyekye, S., Menlah, A., & Akuoko, C. (2021). Mothers' experiences of caring for preterm babies at home: Qualitative insights from an urban setting in a middle-income country. *BMC Pregnancy and Childbirth*, 21(1), 395.

[13] Getie, B., Yismaw, A., & Tiguh, A. (2022). Kangaroo mother care knowledge and practice among mothers who gave birth to preterm and low birth weight babies in Amhara regional state referral hospitals, North West Ethiopia. *International Journal of Africa Nursing Sciences* , 17(1), 100470.

[14] Hägi-Pedersen, M., Dessau, R., Norlyk, A., Stanchev, H., & Kronborg, H. (2022). Comparison of video and in-hospital consultations during early in-home care for premature infants and their families: A randomised trial. *Journal of Telemedicine and Telecare*, 28(1), 24-36.

[15] Hsieh, H., & Shannon, E. (2005). Three approaches to qualitative content analysis. *Qualitative Health Research*, 15(9), 1277-1288.

[16] Jiang, X., & Jiang, H. (2022). Factors associated with post SCBU discharge exclusive breastfeeding rate and duration amongst first time mothers of preterm infants in Shanghai: a longitudinal cohort study. *International Breastfeeding Journal*, 17(1), 1-18.

[17] Johnson, J. O. (2024). Implementation of Family Centered Care for Neonates Admitted in a Special Care Baby Unit in Sierra Leone. Pediatric Health, Medicine and Therapeutics, 189-199.

[18] Kalito, J. D., Masumo, M. M., & Fabian, C. (2024). Acceptability of Kangaroo Mother Care (KMC) by Mothers with Low-Birth-Weight Babies at Arthur Davison Children's Hospital, in Ndola, Zambia. Open Journal of Obstetrics and Gynecology, 14(5), 790-823.

[19] Knappett, M., Nguyen, V., Chaudhry, M., Trawin, J., Kabakyenga, J., Kumbakumba, E., ... & Wiens, M. O. (2024). Pediatric post-discharge mortality in resource-poor countries: a systematic review and meta-analysis. EClinicalMedicine, 67(1), e102380.

[20] López-Medina, M., López-Araque, A., Linares-Abad, M., & López-Medina, I. (2020). Umbilical cord separation time, predictors and healing complications in newborns with dry care. *PLoS One*, 15(1), e0227209. https://doi.org/10.1371/journal.pone.0227209.

[21] Maastrup, R., Rom, A., Walloee, S., Sandfeld, H., & Kronborg, H. (2021). Improved exclusive breastfeeding rates in preterm infants after a neonatal nurse training program focusing on six breastfeeding-supportive clinical practices. *PLoS ONE*, 16(2), e0245273.

[22] Maluni, J., Oluoch, D., Molyneux, S., Boga, M., Jones, C., Murila, F., ... & Hinton, L. (2025). After neonatal care, what next? A qualitative study of mothers' post-discharge experiences after premature birth in Kenya. International Journal for Equity in Health, 24(1), e17.

[23] MÓ§relius, E., Kling, K., Haraldsson, E., & Alehagen, S. (2020). You can't flight, you need to fight—A qualitative study of mothers' experiences of feeding extremely preterm infants. *Journal of Clinical Nursing*, 29(13–14), 2420–2428.

[24] Mustapha, B., Simon, P., Abdullahi, B., & Abubakar, H. (2020). Prevalence and associated morbidities of preterm neonatal admissions at the University of Maiduguri Teaching Hospital, North-Eastern Nigeria. *Nigerian Journal of Paediatrics*, 47(3), 264-269.

[25] Nnagbo, J. E., Ugwu, G. O., Eze, M. I., Agu, P. U., Nnagbo, C. L., Udealor, P. C., ... & Ezegwui, H. U. (2024). Incidence, Determinants, and Outcomes of Spontaneous Preterm Birth at Tertiary Hospitals in Enugu, Southeast, Nigeria: A Cross-Sectional Study. Nigerian Journal of Clinical Practice, 27(2), 228-235.

[26] Nsubuga, R., Rujumba, J., Nyende, S., Kisaka, S., Idro, R., & Nankunda, J. (2024). Predictors of mortality among low birth weight neonates after hospital discharge in a low-resource setting: A case study in Uganda. Plos One, 19(6), e0303454.

[27] Nyandiko, W., Kiptoon, P., & Lubuya, F. (2021). Neonatal hypothermia and adherence to World Health Organisation thermal care guidelines among newborns at Moi Teaching and Referral Hospital, Kenya . *PLoS ONE*, 16(3), e0248838.

[28] Opoto, E. W., Ogaji, D. S., Ugege, E. O., Eleke, C., & Samuel, J. C. (2024). Maternal Care of Preterm Infants after Discharge from the Neonatal Intensive Care Unit: A Rapid Review. International Journal of Medicine and Health Development, 29(4), 277-284.

[29] Shwe, D. D., Afolaranmi, T. O., Egbodo, C. O., Musa, J., Oguche, S., & Bode-Thomas, F. (2021). Methylated spirit versus chlorhexidine gel: A randomized non-inferiority trial for prevention of neonatal umbilical cord infection in Jos, North-Central Nigeria. *Nigerian Journal of Clinical Practice, 24*(5), 762-769.

[30] Sivanandan, S., & Sankar, M. J. (2023). Kangaroo mother care for preterm or low birth weight infants: a systematic review and meta-analysis. *BMJ Global Health, 8*(6), e010728.

[31] Udeogalanya, E. A. (2023). Neonatal Home-Care Practices of Mothers in Ihiala Local Government Area of Anambra State. Saudi Journal of Nursing and Health Care, 6(12), 461-472.

[32] Yuan, M., Long, Y., Liu, T., Liu, J., Qiu, S., Lin, T., ... & Fang, Y. (2024). Soft electronics for advanced infant monitoring. Materials Today, 75(1), 166-186.

[33] Zini, M., & Omo-Aghoja, L. (2019). Clinical sociodemographic correlates of preterm deliveries in two teaching hospitals in southern Nigeria. *Ghana Medical Journal*, 53(1), 20-28.

TABLES

Table 1: Characteristics of the respondents in the qualitative arm of the study (n = 30)

Unique Identifier	Age	Parity	Educational level	Occupation
PW01	41	2	Primary	Artisan
PW02	34	1	Primary	Civil servant
PW03	31	1	Primary	Civil servant
PW04	29	1	Primary	Civil servant
PW05	33	3	Primary	Farmer
PW06	36	3	Secondary	Trader
PW07	35	1	Tertiary	Civil servant
PW08	41	2	Secondary	Civil servant
PW09	37	1	Tertiary	Farmer
PW10	41	1	Tertiary	Civil servant
PW11	38	3	Tertiary	Trader
PW12	40	3	Tertiary	Trader
PW13	31	3	Primary	Civil servant
PW14	32	2	Secondary	Artisan
PW15	36	2	Secondary	Trader
PW16	38	2	Primary	Civil servant
PW17	33	1	Tertiary	Artisan
PW18	39	3	Secondary	Civil servant
PW19	34	2	Tertiary	Trader
PW20	37	2	Secondary	Artisan
PW21	32	1	Primary	Civil servant
PW22	38	3	Tertiary	Civil servant
PW23	31	2	Secondary	Civil servant
PW24	33	1	Tertiary	Civil servant
PW25	34	3	Tertiary	Trader
PW26	30	1	Tertiary	Civil servant
PW27	40	2	Primary	Civil servant
PW28	31	3	Primary	Artisan
PW29	37	3	Tertiary	Farmer
PW30	37	1	Tertiary	Trader

Table 2: Socio-demographic characteristics of the mother and preterm infant pairs

Category	mean (SD)	f	%
Age	33.50 (6.59)		
20-29		46	27.06
30-39		95	55.88

40-49		29	17.06
Parity			
1		83	48.82
2		51	30.00
3		36	21.18
Educational level			
Primary		56	32.94
Secondary		91	53.53
Tertiary		23	13.53
Occupation			
Civil Servant		19	11.18
Company Staff		34	20.00
Trader		66	38.82
Artisan		51	30.00
Hospital of SCBU treatment			
UPTH		100	58.82
RSUTH		70	41.18
Gestation of birth			
33-34 weeks		56	32.94
35-36 weeks		114	67.06
Tobacco use status			
Does not use tobacco		163	95.88
Smoke cigarettes		5	2.94
Licks tobacco		2	1.18
Co-morbidity status			
Hypertension		3	1.76
Diabetes		1	0.59
None		166	97.65
Preterm Infant Characteristics			
Gender			
Female		91	53.53
Male		79	46.47
APGAR Score 5 at birth	6.00 (1.00)		
Morbidity at birth			
Jaundice		51	30.00
Respiratory distress		119	70.00
Birth weight at discharge from SCBU (kg)	2.19 (0.16)		
Birth length at discharge from SCBU (cm)	43.43 (1.13)		

SD = standard deviation, f = frequency, % = percent, n = sample size, kg = kilogram, cm = centimetres

Table 3: Generated themes and subthemes from qualitative information on nutrition and temperature regulation (n = 30)

Domain	Themes	Subthemes	Illustrative Quotes
Feeding	Assessing Infant Nutrition	Observing feeding behavior and weight gain	"I dey watch how my pikin dey chop and how e dey grow." (PW12)
		Monitoring feeding patterns	"I dey always check di weight of my pikin and di way e dey suck breast or bottle." (PW17)
		Following medical advice on feeding	"Na di advice wey doctor give me I dey follow, e say make I feed my pikin every two hours." (PW22)

		Seeking healthcare support	"I dey observe di pattern of my pikin feeding. If I notice say e dey struggle... I go talk to di doctor." (PW23)
	Strategies for Infant Feeding	Adjusting feeding positions	"I dey try different feeding positions to see which one my pikin dey comfortable with." (PW2)
		Ensuring burping after feeding	"I dey make sure say I dey burp my pikin well after feeding to prevent gas and discomfort." (PW9)
		Creating a calm feeding environment	"I dey try to create calm and quiet environment during feeding time." (PW14)
	Adjusting Feed Amount and Schedule	Monitoring weight and adjusting intake	"I dey monitor di weight of my pikin regularly... I go adjust or increase di amount wey e dey chop." (PW1)
		Observing feeding patterns for changes	"I dey observe di pikin feeding pattern to see if e dey feed well or if e dey struggle." (PW16)
		Consulting healthcare providers	"I dey always communicate with di doctor and di healthcare team about my pikin progress." (PW20)
	Dealing with Challenges in Feeding	Difficulty with sucking	"One challenge wey I dey face na when my pikin no wan suck breast or bottle well." (PW18)
		Struggles with swallowing or choking	"My pikin dey struggle with swallowing or if e dey choke during feeding." (PW23)
		Refusal to feed or vomiting after feeding	"Sometimes, my pikin dey refuse to feed at all or e dey vomit after feeding." (PW28)
Temperature regulation	Temperature Regulation Strategies	Ensuring room comfort	"I dey always make sure say di room temperature dey comfortable for my pikin." (PW4)
		Dressing baby appropriately for weather	"I dey dress my pikin in clothes wey dey appropriate for di weather." (PW19)
		Using appropriate bedding	"I dey always make sure say di bedding and blankets wey I use for my pikin dey clean and comfortable." (PW30)
	Ambient Temperature Regulation	Monitoring room temperature	"I dey use thermometer to check di room temperature regularly." (PW3)
		Controlling airflow and insulation	"I dey always keep di windows and doors closed to prevent heat loss or too much cold air." (PW11)
		Insulating room for stability	"If I notice say di room temperature dey fluctuate too much, I go try to insulate di room better." (PW25)
	Use of Thermal Support Equipment	Using warming pads	"One equipment I dey use be warming pad wey I fit place under di baby bed." (PW10)
		Using body heat or external heat sources	"Sometimes, I fit use my body heat or kerozene lamp to warm up the room and my pikin." (PW23)
		Using warm blankets and swaddles	"I use warm blankets or swaddle cloths wey dey specially designed for babies." (PW29)

Table 4: Generated themes and subthemes from qualitative information on hygiene, growth monitoring/vigilance, and socio-cultural challenges (n = 30)

Domain	Themes	Subthemes	Illustrative Quotes
Hygiene	Personal Hand Hygiene	Washing hands before handling baby	"I dey always make sure say I wash my hands well-well with soap and water before I touch my pikin." (PW7)

		Enforcing hygiene rules for visitors	"I dey make sure say anybody wey wan touch my pikin must wash their hands well-well." (PW15)
		Maintaining a clean environment	"I dey always keep di environment clean and hygienic." (PW24)
		Ensuring baby's vaccination and health	"I dey make sure say my pikin dey up-to-date with all im vaccinations." (PW27)
	Visitors' Hand Hygiene	Encouraging visitors to wash hands	"As visitors dey come to see my pikin, I dey politely remind dem to wash their hands well-well." (PW7)
		Providing hand sanitizer	"I dey always keep hand sanitizer near di entrance or close to where my pikin dey." (PW12)
		Using visual reminders	"I hang signs around di house to remind visitors to wash their hands before touching di baby." (PW18)
	Umbilical Stump Care	Hand hygiene before and after care	"I dey always wash my hands with soap and water before and after I touch di umbilical stump." (PW3)
		Cleaning the stump with appropriate methods	"I dey use spirit or chlorhexidine to gently clean around di umbilical stump two to three times everyday." (PW16)
		Preventing friction and ensuring airflow	"I dey make sure say di diaper no dey rub against di umbilical cord stump." (PW23)
		Recognizing and responding to signs of infection	"If I notice any signs of infection like redness, swelling, or discharge around di stump, I go quickly carry my pikin go see doctor for treatment." (PW26)
Growth monitoring and Vigilance	Growth Monitoring	Tracking weight, length, and head circumference	"I dey always monitor my pikin weight, length, and head circumference to track im growth progress." (PW4)
		Observing developmental milestones	"I dey observe di pikin developmental milestones to make sure say e dey meet dem at di appropriate times." (PW17)
	Health Observation	Monitoring signs of illness or distress	"I dey make sure say I dey observe for any signs of illness or distress in my pikin." (PW21)
		Attending regular medical check-ups	"I dey make sure say I dey follow di schedule wey di doctor give me for regular check-ups and growth monitoring." (PW30)
	Utilizing Equipment for Growth Monitoring	Using baby scales to track weight	"One equipment wey I dey use na baby scale. Dis scale dey help me measure di weight of my pikin regularly." (PW11)
		Measuring length with a tape	"I use measuring tape to measure di length of my pikin." (PW14)
		Using growth charts for comparison	"I use growth charts wey dey specially designed for tracking di growth of preterm infants." (PW21)
	Noting Growth Outcomes	Observing steady weight gain and muscle development	"My baby don dey grow well and e don dey show signs of strong development." (PW13)
		Noticing social and communication development	"My baby don dey more alert and e dey respond to sounds and faces around am." (PW14)
		Struggles with sleep patterns	"My baby still dey struggle with sleeping through di night." (PW22)
Socio-cultural challenges	Socio-Cultural Challenges to Preterm Infant Care	Stigma and misconceptions about preterm birth	"One challenge wey I face na di stigma and misconceptions wey dey around preterm birth for my community." (PW6)

		Lack of support from family and friends	"Nah di lack of support and understanding from family and friends." (PW18)
		Cultural beliefs conflicting with medical advice	"Sometimes, cultural beliefs and practices dey clash with di medical advice wey I dey receive for caring for my preterm pikin." (PW24)