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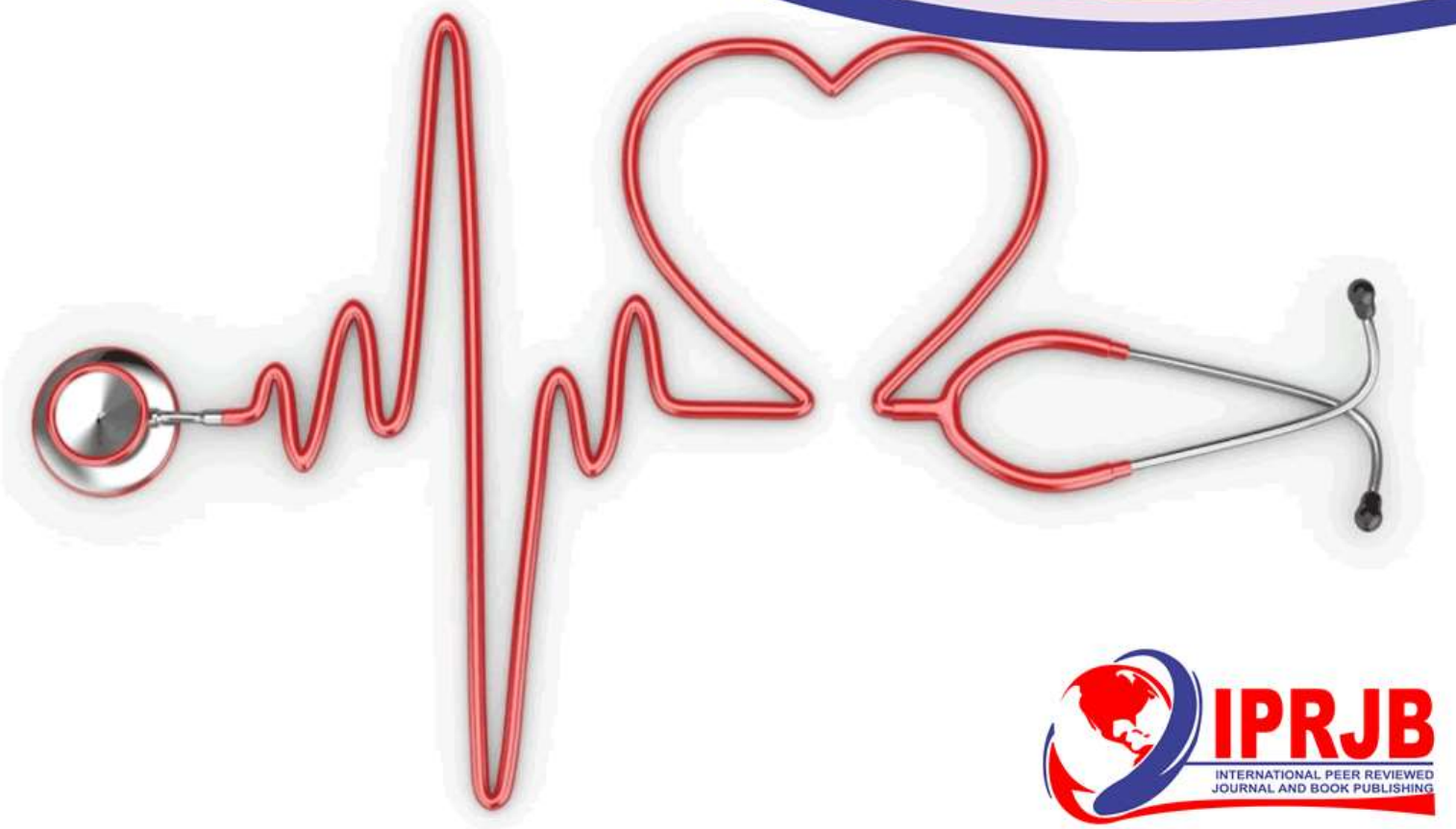

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Selected Infant Care Practices and Their Impact on Mother-Child HIV Transmission: A Qualitative Study

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Abstract

Purpose: The current study aimed at establishing infant care practices and their influence on mother-to-child HIV transmission among HIV-exposed infants aged 6 weeks to 18 months in Machakos Level 5 Hospital.

Methodology: A cross-sectional study was conducted in Machakos Level 5 Hospital. Data were collected from thirty-two mother-infant pairs using a focus group discussion guide. Four focus group discussions were conducted, each with 8 participants. The data were thematically analyzed and presented using narratives and quotes. Ethical approval and research permit were obtained from the JKUAT Institutional Scientific and Ethics Review Committee, and the National Commission for Science, Technology, and Innovation. Written informed consent was obtained from all the participants.

Findings: Mothers had a good understanding of MTCT of HIV and its prevention. However, they faced challenges in adhering to infant prophylaxis. The participants had inadequate knowledge of teething signs, where diarrhea and fever were reported as signs and symptoms. Some of the potentially harmful practices practiced by mothers were gum cutting, rubbing the gums with goat's excreta or Ashton and soda-mint mixture for teething, and administering alcohol and herbs to manage colic. They also reported inadequate healthcare provider support in managing teething and colic.

Unique Contribution to Theory, Practice and Policy: Despite mothers' adequate knowledge of MTCT and its prevention, significant gaps persist between knowledge and practice. Difficulties in adhering to infant prophylaxis, compounded with non-disclosure and insufficient support from healthcare providers, contributed to the adoption of unsafe infant care practices. These challenges need to be addressed through strengthened healthcare guidance, culturally sensitive counselling, community health education, and continuous support to promote safe infant care practices. The study recommends that the government should integrate safe teething and colic management into PMTCT protocols.

Keywords: *Teething, Infantile Colic, Infant Care, Pediatric HIV, Mother-To-Child Transmission*

JEL Codes: *I12, I18*

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INTRODUCTION

Significant progress has been made in reducing mother-to-child transmission (MTCT) of HIV. However, 120,000 new infections and 75,000 AIDS-related deaths occurred among children worldwide in 2024 (UNICEF, 2025) . Sub-Saharan Africa accounts for over 86% of these new HIV infections. Kenya, one of the Sub-Saharan countries, records high rates (9.3%) of mother-to-child transmission of HIV, with approximately 4,349 new HIV infections and 2,686 AIDS-related deaths recorded among children aged 0-14 years by the end of 2024. By the end of the same year, Machakos County reported 83 new pediatric HIV cases and 51 AIDS related deaths among children (NSDCC, 2025). Without risk reduction measures, 15% and 45% HIV Exposed infants are likely to contract the virus. However, with optimal uptake of the available MTCT preventive measures, the transmission rate can be reduced to less than 5% among breastfeeding and less than 2% among the non-breastfeeding population.

Globally, the prevalence of teething problems was found to be 80.0 % (Garima et al., 2025). Mothers consider the teething stage in infants to be very stressful, forcing parents to apply practices detrimental to the child's health, as only 5% of mothers were reported not to offer any treatment during this period (Yousif, 2020).

Previous studies reveal a misconception in systemic teething symptoms, such as fever and diarrhea (Yousif, 2020). These misconceptions have contributed to mothers and caregivers using potentially harmful remedies influenced by cultural traditions. Teeth extraction or rubbing with herbs on the gingiva of children below two years old is common in Eastern Africa, including Kenya, with gum rubbing and incision being prevalent among the Kamba community. Practices such as gum rubbing until bleeding, gum incision, or tooth extraction expose the child to acute and chronic health implications (Anjum et al., 2022), including the risk of contracting HIV. In Uganda, it is believed that extracting primary canines could prevent sickness, as they are considered sources of illness (Iriso et al., 2000). It was found that mothers in Southwest Ethiopia prefer traditional practices such as the extraction of primary teeth (9.3%), gum rubbing with herbs (6.5%), and garlic (12.1%) to manage teething symptoms(Getaneh et al., 2018). In Basra, Iraq, 62% of mothers give systemic medications such as antipyretics, antibiotics, and antidiarrheal agents, while others use teething gel, pacifiers, gum massage, and hard foods like carrots and biscuits to manage it (Yousif, 2020). A recent study in Ghana found that 34.7% of mothers engaged in poor practices for managing infant teething symptoms(Wuni et al., 2024). A study done in Kenya among the Maasai children revealed that tooth buds or maggots are false teeth, nylon or worms are responsible for diarrheal, fever, vomiting, and stunted growth, and thus, extracting the teeth was believed to be a sure way of curing these ailments (Mutai et al., 2010). Gum lancing during teething was significantly associated with child mortality, persistent diarrhea, fever, difficulty breathing, and refusal to eat among children in Kangundo District Hospital, Machakos County (Olabu et al., 2013).

Infantile colic is excessive crying in healthy infants, and the cause is unknown. It is very common during the first months of life. The crying mainly occurs in the evenings and could last up to three hours or more daily. There is no identifiable risk factor or causal association with infantile colic, as the etiology remains unclear. Practices for managing infantile colic can vary widely across communities' cultural beliefs and practices. However, it was revealed that the most effective intervention for colic is parental education on infantile colic (Zeevenhooven et al., 2018). This was supported by a study finding where mothers who had received training on infantile colic reported a reduced duration and severity of colic (Özdemir

et al., 2026). Applying massage and kangaroo care for infants with colic soothes infantile colic (Ertem & Özyazıcıoğlu, 2025). A study conducted in Pakistan found that the prevalence of infantile colic ranges between 21% and 40%, additionally, 51% of parents had used herbal tea before seeking professional advice from physicians (Jalal et al., 2024). Herbal remedies, massage, and swaddling of the infants have been reported to be common management strategies for infantile colic (Radwan et al., 2025). The use of herbal remedies can damage the infant's gut, increasing the risk of exposure to HIV in breast milk. Latest studies in Jazan, Saudi Arabia, and Palestine reported that only 3.9% and 18.9%, respectively, of mothers consulted with a healthcare professional on managing infantile colic (Mustafa et al., 2023; Radwan et al., 2025). Therefore, it is highly recommended to always consult with a healthcare professional when colic persists.

The current PMTCT indicators lack colic and teething aspects, which may be key in PMTCT surveillance because the source (unsafe colic/ teething procedure) of HIV infection may go forgotten or undisclosed. There are also no PMTCT counselling that address teething/colic specifically, hence, mothers and caregivers may not connect traditional practices to HIV transmission risk. Traditional oral procedures break the oral mucosa, increasing the risk of HIV transmission during lactation(Mitke, 2010). These practices may also indirectly disrupt exclusive breastfeeding and adherence to infant prophylaxis, which is recommended as a key PMTCT intervention in low- to medium-income countries.

Problem Statement

Infant teething and colic are normal developmental phases. Yet, they are often perceived to be distressful conditions influencing mothers and caregivers to adopt various soothing practices, some of which may be unsafe. Teething is a physiological process experienced by all infants and children, commonly associated with gingival irritation and discomfort, while colic is widely believed to cause abdominal pain, contributing to caregivers' experience of anxiety and frustration due to challenges of managing these symptoms. Practices like the use of unsterilized objects and administration of herbal remedies can cause mucosal surface irritation, inflammation, and gastrointestinal tract disturbances, thereby increasing the infant's susceptibility to HIV infection transmission during breastfeeding. Moreover, such practices may interfere with adherence to infant antiretroviral prophylaxis, particularly when they lead to vomiting or diarrhea. However, existing studies have largely explored maternal and infant clinical factors in vertical transmission, overlooking the role of pediatric care practices in HIV transmission.

Research Gap

Some cultural and traditional infant care practices pose a threat to the health of infants by creating mucosal trauma, which acts as an entry point for the virus. However, no research has been conducted in Machakos County regarding the link between MTCT of HIV and the management of teething and colic complications. The current study investigated these practices and their impact on HIV transmission from mother to child.

Conceptual Framework

The choice of infant care practices during teething and colic has a direct impact on the infant's health. The independent variable influences the intervening variable, which in turn determines the dependent variable/outcome. Unsafe teething and colic management practices increase the risk of HIV transmission from mother to child during breastfeeding, not only by disrupting infant prophylaxis adherence but also by causing injury to the oral mucosa and irritating the

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gut, creating a route of entry for free HIV in breastmilk. However, healthcare provider support is critical for preventing the transmission of HIV, as mothers may not know the HIV transmission risk associated with the unsafe traditional practices Figure 1.

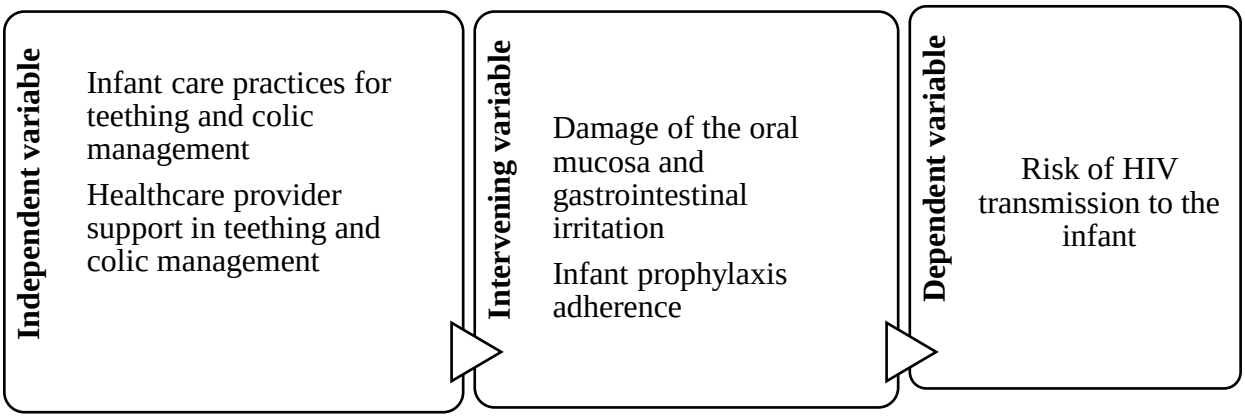

Figure 1: Conceptual framework

METHODOLOGY

Study Design

A cross-sectional qualitative study was conducted in Machakos Level 5 Hospital, Kenya.

Data Collection

The study participants were HIV-exposed infants born 6 weeks to 18 months before the study, who were enrolled for EID services in Machakos Level 5 Hospital. A predetermined sample size of 30 participants was selected using an expert purposive sampling strategy. Pretesting of the data collection tools was done in Mutituni Health Centre as part of the training of research assistants. Data saturation was reached with four (4) focused group discussions, each consisting of eight (8) participants. The FGD session lasted for about 60-90 minutes. Mothers were booked for the discussions on a separate day from the clinic appointment date. The FGDs were tape-recorded, with permission verbally sought from the group, and a research assistant took notes.

Data Analysis and Presentation

The focus group discussions audios were transcribed and analyzed using thematic analysis (Kiger & Varpio, 2020). A six-stage systematic thematic analysis process identified, analyzed, and reported themes within the study findings. This method ensured a clear connection between the data, interpretation, and conclusions (Naeem et al., 2023). The data was synthesized and contextualized within the scope of the study to answer the research question.

The results were presented using narrative and quotes, thus communicating the real-life experiences of participants, enriching the analysis, and ensuring a better understanding of the study findings.

Ethical Consideration

Approval was sought and obtained from the Jomo Kenyatta University of Agriculture and Technology Institutional Scientific and Ethics Review Committee; Ref: JKU/ISERC/02317/1397 and the National Commission for Science, Technology and

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Innovation; Ref: NACOSTI/P/24/40307. Authorization was obtained from the medical superintendent of Machakos level 5 hospital; Ref: MKS/DMS/RESEARCH APPROVALS/2024/35. Written informed consent was obtained from the respondents before data collection. The research participation was entirely voluntary upon agreement, and the respondents were free to withdraw from the study without any consequences or penalties. We conducted the FGDs in private, and unique identification codes were used instead of the real names of the participants to ensure the information obtained remained anonymous. The participants were assured of the confidentiality of the information, which was only used for this study.

RESULTS

Perceived Maternal Understanding of Mother-to-Child Transmission of HIV and Its Prevention

Responses from the focus group discussions reflect that mothers had varying levels of knowledge regarding MTCT of HIV. Most participants correctly identify pregnancy, childbirth, and breastfeeding as critical periods during which transmission can occur. Mothers described mother-to-child transmission as; *"…….is a way in which a mother can transmit HIV to her baby during pregnancy, delivery, or breastfeeding."* -FGD 1, while others similarly noted that it occurs *"……. during delivery, or breastfeeding"* -FGD 3, or broadly defined as *".... when a mother transmits HIV to her child"*- FGD 4. Despite the general awareness, the discussions revealed gaps in a comprehensive understanding of the MTCT of HIV.

Concerning the prevention of mother-to-child transmission of HIV, participants across the FGDs demonstrated awareness of interventions that can effectively prevent mother-to-child transmission (MTCT) of HIV. They emphasized infant and maternal antiretroviral adherence, viral load suppression, and retention in care. This was demonstrated in statements such as, *"……. give the baby the medicine as prescribed, and the mother should also take her medicine to ensure that her viral load is suppressed*"-FGD 1 and "…...*prevention of HIV from the mother to child depends on maintaining an undetectable viral load through retention in care"* -FGD 1. Similarly, participants stressed that "…… *Mothers should ensure the viral load is maintained low." (*FGD 2).

In addition, exclusive breastfeeding for the first six months was recognized as an important preventive strategy for MTCT as noted by a participant who "..… *Exclusively breastfeeding the baby until 6months"*- FGD 1. Mothers also emphasized the importance of close maternal monitoring of infants to minimize exposure to potentially unsafe caregiving practices. The ideal was captured in the advice *"……. a mother should stay with her child and take good care of her; she should not leave her at home when she is below 6 months.* She added that "... *Stay with your child until she finishes breastfeeding, do not leave her with caregivers or siblings."* (FGD 2). Same was reported in FGD 3 where a mother cautioned *"……. Don't give the baby to everyone, I mean, stay with your child until six months."* However, this recommendation conflicted directly with economic reality, where a participant voiced the tension between optimal infant care practices and livelihood demands stating, *"……. how will I take care of my baby solely for 6months when I have to go work to cater for the family bills? This seems impossible to me because I am a single parent and I have to feed the family."* (FGD 3). This underscores a critical gap between knowledge of recommended practices and the practical ability to implement them, particularly in low-income settings.

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Management of Teething in Infants

Signs and Symptoms

Mothers perceived teething as a distressing stage marked by oral discomfort, behavioral changes, and systemic symptoms. They commonly associated teething with: "…. *diarrhea…. drooling, irritability…. eating fingers, ……. biting and gnawing objects"*-FGD 1. *"…. diarrhea, which is green in color…. biting the breast nipple during breastfeeding"*-. FGD 2. "…. *Pulling the ears, …. swollen gums, ……lack of sleep……. Fever and diarrhea"*-FGD 3. "…. *diarrhea….* R*efusing to eat and breastfeed"*-FGD 4.

Teething Management Practices

Participants adopted various strategies to deal with teething discomfort. The findings highlight the persistence of potentially harmful traditional practices, including the rubbing of gums with Ashton and soda-mint – a herbal mixture, application of goats' excreta, and gum incision.

Some of the responses were: "…. *I gave the baby a teether…... I rub the gums with soda mint and Ashton, …. I breastfeed the baby, ... I give Paracetamol, … I removed the plastic teeth, …. I rub the gums with goats' feaces…. I used a frozen teether or sometime cloth to soothe the baby's gums"*- FGD 1. "….. *I rub with teething gel. ….. I administered Ashton for the baby to swallow…. I incised my baby's swollen gums to allow easy eruption of the teeth …. I consult with the doctor"*- FGD 2. *"… I use honey to rub a baby's gum, … I gave a carrot for the baby to gnaw … I use a pacifier."*-FGD 3. "…... *I don't apply anything …. I massage the baby's gums with my fingers*."- FGD 4

While balancing teething needs and HIV prevention, mothers showed a conscious effort to balance teething practices with considerations of HIV prevention, often preventing potentially unsafe practices. This was specifically through limited social influence, avoiding rubbing the gums, and seeking only professional healthcare advice, as stated: *"… I carry my baby everywhere I go. I don't leave her with anyone to prevent her from being rubbed or incised the gums by my mother-in-law."*- FGD 1. *"… I gave my baby Soda mint and Ashton to swallow instead of rubbing the gums with the mixture."*- FGD 1. *"… I keep away from friends as they can easily influence me to practice unsafe acts to manage teething. I only live with my husband; no friends or other family members visit us."*-FGD 2. *"… I always consult with the healthcare provider"*- FGD 3.

Challenges in Infant Prophylaxis (IP) Adherence during Teething

The majority of mothers had experienced challenges in adhering to infant prophylaxis during the teething phase. They reported that teething discomfort introduced significant challenges to infant prophylaxis adherence, especially when the infant was drooling and sucking fingers. *"…. Yes, the baby spits the IP, especially during teething, since they usually eat their fingers and drool. This affects the dosage, yet the healthcare provider advises us not to add a dose even after spitting it"*-FGD 1.

Also, with competing medications, a mother may forget to administer the infant prophylaxis when she has other drugs to give, like paracetamol and ORS, during the teething period, as stated in the quote; "…c*hances of forgetting to administer infant prophylaxis during teething are prevalent when other drugs are given to the baby to manage teething symptoms and complications I.e. Ashton, ORS for diarrhea, and paracetamol for fever."*- FGD 2

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Support from Healthcare Providers for Teething Management

The findings reveal that healthcare providers supported mothers in teething management. *"……Yes, we are always encouraged to consult a doctor during teething and avoid traditional practices like gum scrubbing, incising, or applying herbs"*- FGD 3. However, they have not adequately provided information on balancing teething management with HIV prevention, as stated *"…No, not unless you consult the doctor, they never discuss it with you early before the baby starts experiencing it, and in most cases, it is usually too late, as I had incised his gums and applied herbs."* – FGD 2.

Infantile Colic Management Practices

From the discussion, most mothers were very confident in managing colic while minimizing the risk of HIV transmission, as some resorted to culturally influenced safe methods of managing colic, such as changing the baby's name and swaddling. Others engaged in practices that could pose risks to the baby's health, like administering alcohol and herbs. Some of the responses were: *"…. I bathe the baby with warm water, ... I change clothing according to the weather …. I change the baby's diaper, …. I changed my diet, …. I swaddle and pray for her… I changed my baby's name, ……I give the baby alcohol to heal stomach upset."*- FGD 1. "*I put the baby on a swing… I put the baby on a vibrating crib with music…. I gave Guinness beer …. I gave Infacol, …. I give gripe water."*- FGD 2. *"…. Massage the baby's stomach with oil … give herbs to ease abdominal pains"* FGD 3. ".. *I take the baby on a stroll……I sing for the baby."* -FGD 4

Living with HIV influenced how mothers managed colic, thus preventing HIV transmission. *"……. being HIV positive has changed how I care for my baby, like for example, I don't give things like alcohol, like others who manage colic by giving the baby alcohol, which is believed to ease the stomach discomfort and aid in digestion."*-FGD 1. *"……I do not consult with my mother on how to manage colic; I only consult a doctor."*-FGD 1. "…. *I make sure I stay and provide close monitoring of my baby when he has colic to prevent other people from managing the colic using harmful practices like administering honey or herbs. If I were not living with HIV, I would always manage it like other people in my community. I almost got into postpartum depression because the baby was crying a lot, especially at night, making it difficult to sleep, yet I was all alone. I was always feeling tired and almost gave up."*-FGD 3

Healthcare Provider Support in Managing Infantile Colic

Participants across all focus group discussions expressed dissatisfaction with the information provided by healthcare providers, as most information focused only on exclusive breastfeeding, with no guidance regarding how to care for infants with colic. Mothers argued that, *"…. they only focus on exclusive breastfeeding and sometimes teething management."*- FGD 1. *"…. I've never been counseled on colic management."* -FGD3.

Discussion

Mothers demonstrated awareness of MTCT and its prevention; however, their knowledge was not comprehensive. Having an HIV-positive status influenced how mothers managed teething and colic. However, some still engaged in unsafe practices that could potentially increase the risk of MTCT of HIV.

The majority of them believed at least one symptom was linked to teething, a finding similar to that reported by (Getaneh et al., 2018; Pereira et al., 2023). Mothers didn't have a comprehensive knowledge of the signs and symptoms of teething in infants, although their

responses reflected both physiological and behavioral changes of infants during this period. Teething was reported to cause diarrhea (Getaneh et al., 2018; Mutai et al., 2010) and fever (Noor-Mohammed & Basha, 2012), a finding inconsistent with a study that revealed that there was no association between fever and teething in infants(Nemezio et al., 2017). Mothers adopted unsafe practices (Abdulsatar et al., 2022) like rubbing of the gums using goat excreta, herbs(*mitishamba*), soda mint, and *Ashton* mixture, which would potentially increase the risk of HIV transmission through injuries in the oral mucosa and gastrointestinal irritation. Nevertheless, various strategies were also applied by mothers to deal with teething discomfort while ensuring HIV prevention. These include limiting social influence on how to manage teething discomfort, avoiding unsafe practices like gum scrubbing and incising, and seeking only professional healthcare advice. The study revealed that most mothers adhered to good teething management practices. The findings were better than those reported in Ghana, where only 65.3% of mothers reported good teething management practices (Wuni et al., 2024). Most mothers had difficulty adhering to infant prophylaxis during teething, especially when their infants were drooling. They also did not feel supported enough by healthcare providers in managing teething discomfort.

Regarding infantile colic management, most mothers adopted safe infant care practices. However, some resorted to culturally influenced methods like administering herbal remedies to soothe the baby, which was also reported in Palestine (Radwan et al., 2025). Another extreme case reported using alcohol, Guinness beer, to manage colic. These practices could potentially pose a risk of HIV transmission to the infant as they may damage the infant's gut lining, thus creating a route for entry of HIV into the infant's body. Substances like herbs and alcohol may also result in vomiting, thus interfering with adherence to infant prophylaxis, hence reducing its effectiveness in preventing MTCT of HIV. A significant gap was observed in the provision of health information/counselling on managing colic alongside HIV prevention, leaving participants reliant on personal or community knowledge, which may be misleading.

The study has some limitations; due to self-reporting of the practices adopted by the mothers, there is a potential social desirability bias. The results were also not subjected to statistical testing; therefore, they cannot be generalized or interpreted as statistically significant.

Conclusion

While mothers demonstrated a general awareness of MTCT of HIV, the findings suggest gaps in the role of safe infant care in the context of prevention of mother-to-child transmission of HIV, as mothers reported unsafe colic and teething management practices. The mention of fever and diarrhea as signs and symptoms of teething indicates that the community is misinformed and unable to distinguish them from unrelated illnesses that are inaccurately attributed to teething. Misattribution of fever to teething acts as a barrier to timely clinical care for actual infant infections such as pneumonia and meningitis, thereby progressing from manageable to fatal. Teething periods posed challenges to adherence to infant prophylaxis due to drooling and infant prophylaxis spit-out, thus creating dangerous windows of potential HIV exposure. The current study reported that limited proactive guidance from healthcare providers on teething and colic infant care led to reliance on traditional practices in some cases.

Recommendations

The study recommends the provision of health education to the community and caregivers on safe teething discomfort and infantile colic management practices in relation to HIV prevention. Train grandmothers, traditional birth attendants, and the elderly community on safe infant care because they are often the key decision makers for teething and colic interventions. Also, guide mothers living with HIV on how they can refuse harmful practices like gum rubbing with herbs without disclosing their HIV status. The study calls for integration of PMTCT adherence with culturally sensitive counseling on safe infant care for teething and colic.

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