

Assessing health facility-related characteristics influencing the retention of HIV-exposed infants in the EID Care Clinic of Nebbi General Hospital. Descriptive cross-sectional study.

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Abstract

Background:

If HIV-exposed infants (HEIs) are not retained, they risk delayed diagnosis of infection, missed initiation of antiretroviral therapy, increased infant morbidity and mortality, and missed opportunities for HIV-free survival. The study aims to assess health facility-related characteristics influencing the retention of HEIs in the EID Care Clinic at Nebbi General Hospital.

Methods:

A descriptive cross-sectional quantitative study was conducted among 44 caregivers of HEIs at Nebbi General Hospital using convenience sampling and a semi-structured questionnaire. Data were analyzed descriptively with frequencies, percentages, and charts in Microsoft Excel.

Results:

Nearly 17 (38.6%) of the respondents were aged 20–29 years, while at least 5 (11.3%) were aged 40 years and above. 21(47.7%) of the respondents said the clinic sometimes had HIV test kits and other EID materials, whereas the minority 5(11.4%) mentioned that they were always available. The majority of respondents, 30 (68.2%), reported that there were not enough health workers to attend to mothers and babies without long delays, while a few, 4 (9.1%), believed the staffing was adequate. Half of the mothers 22 (50%) reported waiting 1–2 hours before receiving services, while only 3 (6.8%) waited less than 30 minutes. Regarding how health workers treated mothers, the highest proportion, 18 (40.9%) of respondents described health workers as often harsh or judgmental, while the least, 9 (20.5%), felt health workers were very kind and supportive. Concerning distance to the EID clinic, most respondents, 30 (68.2%), lived 6–10 km away. Meanwhile, minority 6 (13.6%) lived less than 2 km from the clinic.

Conclusion:

Health facility challenges such as stock-outs of test kits, understaffing, long waiting times, harsh provider attitudes, and long distances further discouraged mothers from returning for scheduled visits.

Recommendations

Provide continuous health education to mothers on the importance of consistent infant HIV testing.

Keywords: HIV-exposed infants, early infant diagnosis, retention in care, health facility factors, provider attitudes, Nebbi General Hospital.

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Background of the Study

Retention of HIV-exposed infants (HEIs) refers to the continuous engagement of infants born to HIV-positive mothers along the early infant diagnosis (EID) and follow-up care continuum—including timely HIV testing, post-test follow-up, cotrimoxazole/ART prophylaxis where necessary, and, if HIV negative, discharge or connection to care.(Christie & du Plessis, 2024). If HEIs are not retained, they risk delayed diagnosis of infection, missed initiation of antiretroviral therapy, increased infant morbidity and mortality, and missed opportunities for HIV-free survival. (Mburu, 2021). In 2023, UNAIDS reported that nearly 1.3 million infants were born to HIV-positive mothers globally, yet only 64% were retained in care until their final HIV test,

highlighting significant attrition within EID programs. (Y. Assefa et al., 2023).

Globally, retention of HEIs remains a growing concern, with about 60–80% of HEIs remaining in care through the critical 18–24-month period, and this results in increased rates of infant HIV infection, higher mortality among HIV-exposed infants, and failure to achieve global elimination of mother-to-child transmission (EMTCT) targets. Moncrieff et al. (2023), due to factors such as maternal non-attendance at follow-up visits, loss to follow-up, home births without linkage to care, weak health-system tracking, and stigma or mobility of mothers (Hoosen, 2021). In Bangladesh, retention rates of HEIs are at 55% resulting in increased risk of missed diagnosis, poor ART initiation, and rising infant HIV prevalence, with the contributing factors including

cultural beliefs that infants born to HIV-positive mothers are “cursed”, limited male partner involvement, rural health facility shortages, and transport barriers. (Kamble et al., 2023).

In Uganda, retention of HEIs is estimated at around 55–80% for the 18-month EID continuum, leading to delayed infant testing and high loss to follow-up, attributed to low maternal education, stigma, poor health worker follow-up, and limited transport access. (Akunzirwe et al., 2025). In northern Uganda, including Nebbi district, retention of HEIs has been estimated at 78.7% at 18 months at a referral hospital, with contributing factors including low antenatal care attendance, home deliveries, delays in initiating infant prophylaxis, frequent maternal transfers, and weak follow-up systems resulting in late HIV diagnosis and infant mortality. (Apangu et al., 2019). Therefore, this study aims to assess health facility-related characteristics influencing the retention of HIV-exposed infants (HEIs) in the EID Care Clinic at Nebbi General Hospital.

METHODOLOGY

Study Design and Rationale

A descriptive cross-sectional study design employing quantitative methods was used to obtain data. The study was descriptive because it assessed characteristics influencing the retention of HIV-exposed infants (HEIs) in the Early Infant Diagnosis (EID) Care Clinic. It was cross-sectional because the data were collected at one point in time without follow-up (Cvetkovic-Vega et al., 2021). Quantitative methods with structured questionnaires provided numerical data on retention rates and associated factors. This design was cost-effective, feasible within a limited timeframe, and suitable for analyzing retention characteristics in a large patient population.

Study Setting and Rationale

The study was conducted at Nebbi General Hospital, located in Nebbi Town, Northern Uganda, approximately 484 kilometers northwest of Kampala. Nebbi General Hospital is a government-owned referral facility providing outpatient, inpatient, maternal, Postnatal Care (PNC), Antenatal Care (ANC), ART services, child and HIV care services, including an Early Infant Diagnosis (EID) clinic for HEIs. The Early Infant Diagnosis (EID) clinic for HIV-Exposed Infants (HEIs) at Nebbi General Hospital is a specialized unit dedicated to the care, monitoring, and follow-up of infants born to HIV-positive mothers. The clinic provides a structured and child-centered environment designed to ensure timely HIV testing, initiation of prophylaxis or antiretroviral therapy when necessary, and regular follow-up visits to monitor growth, development, and overall health outcomes. The unit is staffed by trained healthcare providers, including pediatric nurses, clinical officers, and counselors who offer comprehensive services such as HIV DNA-PCR testing, cotrimoxazole prophylaxis, nutritional support, immunizations, and caregiver

counseling on infant feeding and adherence to medications. The hospital serves a catchment population of approximately 25,000 people with over 1,000 HEIs registered for EID services annually. The site was chosen due to reported challenges in retention of HEIs in the EID care continuum, despite ongoing HIV testing, prophylaxis, and follow-up programs. The study used a sample of 44 respondents and focused on the study objective of maternal-related and health facility characteristics influencing the Retention of HIV HIV-exposed infants in the Early Infant Diagnosis Care Clinic of Nebbi General Hospital. The data was collected from 15th to 20th November using a questionnaire and analyzed using a cross-sectional study design.

Study Population

The study targeted caregivers of HIV-exposed infants (HEIs) enrolled in the EID care clinic at Nebbi General Hospital. These caregivers are directly involved in ensuring follow-up and retention of HEIs in the clinic. Therefore, the study used a sample of 44 respondents and focused on the study objective of maternal-related characteristics influencing the Retention of HIV HIV-exposed infants in the Early Infant Diagnosis Care Clinic of Nebbi General Hospital. The data was collected from 15th to 20th November using a questionnaire and analyzed using a cross-sectional study design.

Sample Size Determination

According to the HMIS 002 EID Clinic Register, there were 50 HEIs actively enrolled in the clinic. Using Krejcie and Morgan's (1970) sample size table, a population of 50 corresponds to a sample size of 44 respondents. Therefore, the study targeted 44 caregivers to ensure representativeness.

Sampling Procedure

A convenience sampling method was employed, selecting caregivers who are readily available and willing to participate during data collection. Caregivers attending the EID clinic were approached, provided information about the study, and invited to participate. Only those meeting the inclusion criteria and giving informed consent were included. Data collection was conducted over 5 clinic days, targeting 9 participants per day to obtain a total of 44 respondents for the success of the study.

Selection Criteria

Inclusion Criteria

Caregivers of HEIs registered at the EID clinic who were present at the clinic during data collection voluntarily consented, Ugandans, able to respond to questions in English/literate.

Exclusion Criteria

Caregivers whose HEIs are critically ill and unable to respond, and those with speech or hearing impairments.

Study Variables

Dependent Variable

Retention of HEIs in the EID care clinic.

Independent Variables

Socio-demographic factors, which included age, religion, marital status, and employment status

Health facility-related factors: Staffing levels, service availability, provider attitudes, waiting times, follow-up, and tracing mechanisms.

Research Instrument and Rationale

A semi-structured questionnaire, written in English, was used. It was divided into three sections: Section A on Socio-demographic characteristics of caregivers and HEIs, Section B on the maternal-related factors influencing retention, and Section C on Health facility-related factors influencing the retention. Questions were closed-ended to ensure consistency and ease of analysis.

Data Collection Procedure

After approval from the institution's research committee, an introductory letter from the Dean, School of Nursing, Mildmay Uganda School of Nursing and Midwifery was granted and used to obtain permission from the director of Nebbi General Hospital administration. The EID clinic in charge was informed, who then facilitated contact with caregivers, and the main purpose of the research study was explained to gain participation and clearances. Each respondent provided verbal and written informed consent, and interviews were conducted in a private corner of the clinic to maintain confidentiality.

Data Management and Analysis

Data Management

Completed questionnaires were checked daily for completeness and accuracy. Hard copies were stored in a locked cabinet accessible only to the researcher. Electronic data was saved on a password-protected computer.

Data Analysis

Data was entered into Microsoft Excel 2019 for analysis. Descriptive statistics (frequencies, percentages, means, and standard deviations) were generated and presented in tables, bar graphs, and pie charts for clarity.

Quality Assurance

Validity

The questionnaire was based on study objectives and reviewed by the supervisor to ensure accurate measurement of factors affecting retention of HEIs.

Reliability

The tool was pre-tested with 8 caregivers at Nebbi Hospital and refined with 3 additional respondents to ensure consistency.

Ethical Considerations

Ethical approval was sought from the institutional research committee of Mildmay Uganda School of Nursing and Midwifery, and an introductory letter from the Dean of Nursing was given seeking permission from the director of Nebbi General Hospital to carry out the study among HIV caregivers of infants at the EIDs clinic. Respondents were assured of confidentiality, anonymity, and their right to withdraw at any time. Numeric codes were used instead of names, and informed consent was obtained in writing before data collection.

Results

Demographic information of respondents.

Table 1 shows the demographic data of the respondents, n=44

Variable	Response	Frequency(n)	Percentage (%)
Age	< 20 years	7	15.9
	20-29 years	17	38.6
	30-39 years	15	34.1
	40 years and above	5	11.3
Education level	Primary	8	18.2
	Secondary	26	59.1
	Tertiary	10	22.7
Marital status	Married	29	65.9
	Unmarried	9	20.5
	Divorced/widow	6	13.6
Employment status	Employed	11	25
	Not employed	33	75
Religion	Christian	30	68.2

	Muslim	14	31.8
	Others	-	-

Table 1 shows that nearly 17 (38.6%) of the respondents were aged 20–29 years, while at least 5 (11.3%) were aged 40 years and above. More than half, 26 (59.1%), had attained secondary education, whereas a minority, 8 (18.2%), had primary education. Most respondents, 29 (65.9%), were married, while a smaller proportion, 6 (13.6%), were

divorced or widowed. Regarding employment status, three-quarters, 33 (75%), of the respondents were not employed compared to only 11 (25%) who were employed. Most respondents, 30 (68.2%), were Christians, while 14 (31.8%) were Muslims, and none belonged to other religions.

Health Facility-Related Characteristics Influencing the Retention of HIV Exposed Infants in the Early Infant Diagnosis Care Clinic of Nebbi General Hospital

Figure 1 Shows the availability of a clinic that has HIV test kits and other EID materials. N=44

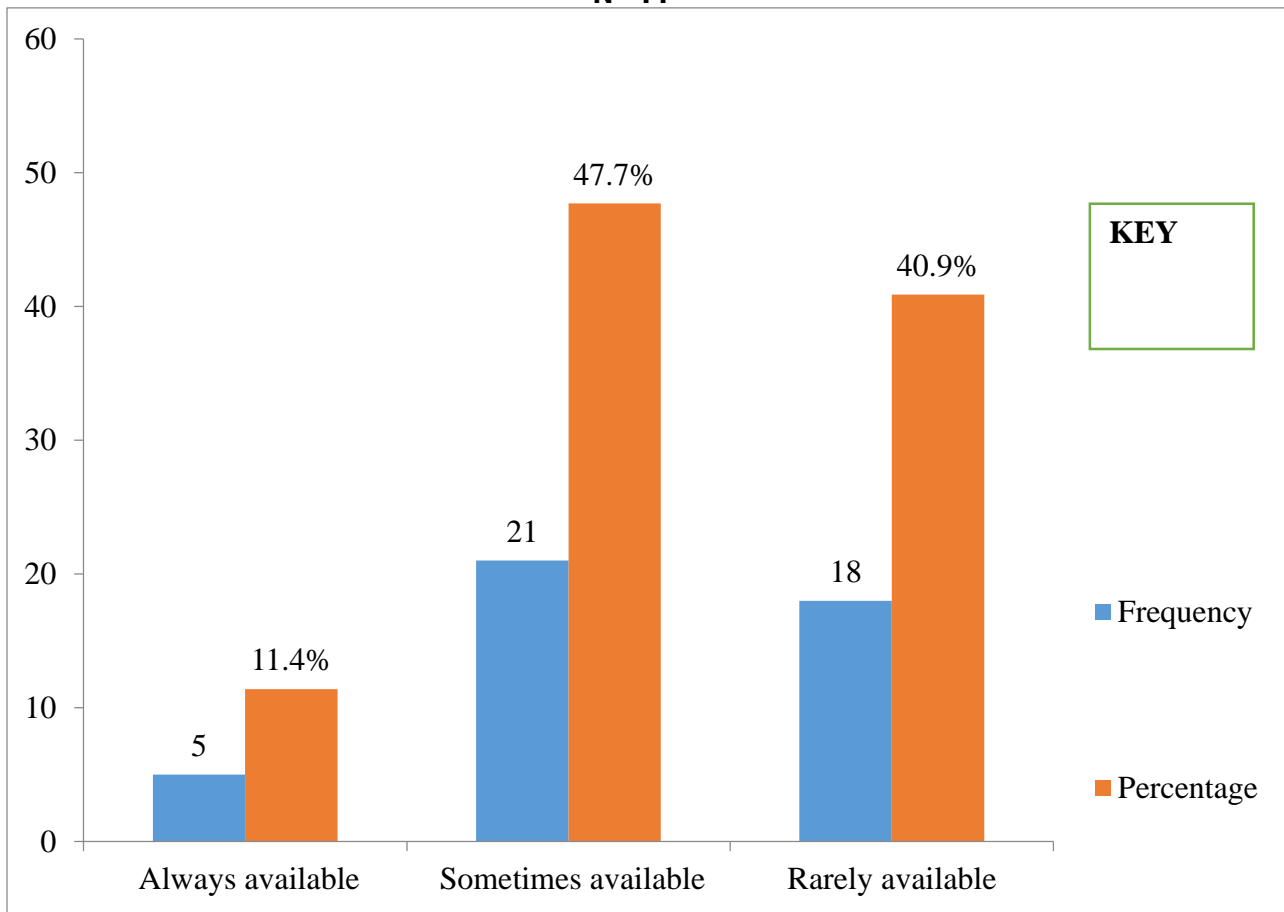


Figure 1 shows that 21(47.7%) of the respondents said the clinic sometimes had HIV test kits and other EID materials, whereas the minority 5(11.4%) mentioned that they were always available.

Table 2 shows other Health Facility-Related Characteristics **n=44**

Variable	Response	Frequency (n)	Percentage (%)
Are there enough health workers to attend to mothers and babies	Yes	4	9.1
	No	30	68.2
	Unsure	10	22.7
Waiting time at the facility	Less than 30 minutes	3	6.8
	30–60 minutes	11	25
	1–2 hours	22	50
	More than 2 hours	8	18.2
Attitude of health workers	Very kind and supportive	9	20.5
	Sometimes rude	17	38.6
	Often harsh	18	40.9
Distance to the EID clinic from home	Less than 2 km	6	13.6
	2–5 km	8	18.2
	6–10 km	30	68.2

Table 2 shows that the majority of respondents, 30 (68.2%), reported that there were not enough health workers to attend to mothers and babies without long delays, while a few, 4 (9.1%), believed the staffing was adequate. Half of the mothers 22 (50%) reported waiting 1–2 hours before receiving services, while only 3 (6.8%) waited less than 30 minutes. Regarding how health workers treated mothers, the highest proportion, 18 (40.9%) of respondents described health workers as often harsh or judgmental, while the least, 9 (20.5%), felt health workers were very kind and supportive.

Concerning distance to the EID clinic, most respondents, 30 (68.2%), lived 6–10 km away. Meanwhile, minority 6 (13.6%) lived less than 2 km from the clinic.

Discussions

The purpose of the study was to determine the availability of HIV test kits and other EID materials, where study findings also revealed that nearly half, 21 (47.7%), of the respondents said the clinic sometimes had HIV test kits and other EID materials, which was in contrast to the problem statement. This could be due to inconsistent supply chains and stock-outs. These points show that interruptions in supplies discourage mothers from returning consistently. This is similar to a study conducted in India by Chandane Tak et al. (2024) On the availability of EID supplies and HIV test kits, it was found that only 46% of health facilities had a consistent stock of dried blood spot (DBS) kits and reagents for early infant diagnosis, leading to delays in test results and loss to follow-up.

The study revealed that the majority of respondents (68.2%) reported that there were not enough health workers to attend to mothers and babies without long delays, and this is in support of the problem statement. This seemed to be due to understaffing at the facility. This hints that long waiting times may discourage caregivers from bringing their infants for subsequent visits. This is in contrast with a study done in Bangladesh by Bolan et al. (2021) On health worker

workload and staffing levels, which found that facilities with adequate staff achieved 68% infant retention.

The study found that half of the mothers 22 (50%) reported waiting 1–2 hours before receiving services. This is because of high patient load and limited staff, reflecting that reducing waiting time could improve satisfaction and retention, and this was in line with the problem statement. This is in support of a study in South Africa by Kufa et al. (2020) On service delivery organization and waiting time, which revealed that 53% of mothers missed scheduled EID visits due to long waiting hours, especially when EID services were offered only on specific days. Similar study findings, the highest proportion 18 (40.9%), described health workers as often harsh or judgmental, attributed to burnout, heavy workload, or poor provider–client communication skills. This implies that negative attitudes from health workers can significantly discourage mothers from continuing EID visits. This is in disagreement with a study in Rwanda by Phommachanh et al. (2019) On health worker attitudes and communication, which found that mothers who received supportive and confidential counseling were 72% more likely to complete infant follow-up.

The findings indicated that most respondents, 30 (68.2%), lived 6–10 km away due to the centralized nature of EID services in the region. This implies that long distances increase transport costs and may lead to missed appointments. This is in line with the problem statement. This is in line with a study in Cameroon by Tchendjou et al. (2020) On the geographical accessibility of EID clinics, which found that mothers living more than 5 kilometers from a health facility were 52% less likely to return for infant testing compared to those living nearby.

Study Limitations

Single-site limitation: The study was conducted only at Nebbi General Hospital, which may not represent the experiences of mothers from other facilities. This limits the generalizability of the findings.

Self-reported information: The study relied on mothers' self-reported experiences, such as stigma, disclosure, and adherence. Some respondents may have given socially desirable answers, which could affect the accuracy of the data.

Cross-sectional design: Data were collected at one point in time, precluding the establishment of cause-and-effect relationships between maternal or facility factors and retention of HIV-exposed infants.

Conclusion

The study achieved its objectives by showing that health facility-related factors strongly influence the retention of HIV-exposed infants in EID services. Health facility challenges such as stock-outs of test kits, understaffing, long waiting times, harsh provider attitudes, and long distances further discouraged mothers from returning for scheduled visits.

Recommendations

Hospital/Facility Management

Recruit additional health workers to reduce workload and minimize waiting time for mothers.

Provide regular training on respectful maternity care and effective communication to reduce harsh provider attitudes. Strengthen mental health screening and counseling support for HIV-positive mothers.

Healthcare Providers

Provide continuous health education to mothers on the importance of consistent infant HIV testing.

Offer follow-up reminders, appointment tracking, and mother-friendly communication to support retention.

Nursing Implications

The study offers important lessons for improving nursing practice in EID and maternal HIV care. The findings show that stigma, non-disclosure, and emotional distress strongly influence whether mothers return for infant follow-up. This means nurses should strengthen counseling, provide non-judgmental care, and actively support mothers emotionally. Doing this will improve mother–nurse trust and increase attendance for infant testing.

Long waiting times, harsh provider attitudes, and inconsistent supplies highlight areas where nurses can advocate for better service organization. Nurses can help improve practice by promoting efficient triage, guiding mothers through services, and communicating kindly to ensure mothers feel respected and supported.

Gaps in maternal ART adherence and poor follow-up emphasize the need for nurses to provide continuous reminders, health education, and partner-involved counseling. By applying these strategies, nurses can improve maternal adherence, enhance infant retention, and strengthen the overall quality of HIV care.

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List of abbreviations

ANC: Antenatal Care

ART: Antiretroviral Therapy

EID: Early Infant Diagnosis

EMTCT: Elimination of Mother-to-Child Transmission

HEIs: HIV-Exposed Infants

HMIS: Health Management Information System

PCR: Polymerase Chain Reaction

PNC: Postnatal Care

Conflict of interest

The author declared no conflict of interest

Author contributions

Acom Judith Peace was the principal investigator

Ms. Nansereko Hasifa supervised the research.

Immaculate Prosperia Naggulu supervised the research.

Jane Frank Nalubega supervised the research.

Data availability

Data is available on request

Author Biography

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