

DETERMINANTS OF MALNUTRITION IN HIV-EXPOSED AND POSITIVE CHILDREN AGED 3 MONTHS -12 YEARS AT BOMBO GENERAL MILITARY HOSPITAL, LUWERO DISTRICT; A CROSS-SECTIONAL STUDY.

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ABSTRACT

Background

The main objective of the study was to investigate the determinants of malnutrition in HIV-positive children aged 3 months to 12 Years at Bombo General Military Hospital, Luwero District.

Methodology

A cross-sectional descriptive study design was employed, utilizing both qualitative and quantitative data collection methods.

Study results

In line with whether parents were staying with the child, results showed that the vast majority (92.65%) agreed while (7.35%) disagreed. Regarding the child's health history, a substantial portion (29.41%) of the children had experienced long-term diseases, while the majority (70.59%) had not. As for hand washing before serving food, a significant number (91.18%) reported doing so, while 8.82% did not.

Conclusion

Individual-related factors included age distribution, gender balance, the impact of parental status, and the importance of caregiver support. Environmental factors were also scrutinized, highlighting the importance of healthcare access and delivery. While a majority lived near healthcare centers, access challenges were evident, emphasizing the need for improved healthcare services. A significant portion of children had experienced long-term diseases and delayed treatment, signaling the urgency of enhancing healthcare delivery. Health system-related factors included clean water access (41.18% from taps) and hygiene practices (88.24% hand washing after latrine use, 91.18% before serving food).

Recommendation

Shortly, the Government of Uganda through the Ministry of Health should enhance Pediatric Nutrition Programs by developing and implementing targeted nutrition initiatives tailored to the diverse age groups of HIV-exposed and positive children, with a specific emphasis on early childhood nutrition (1 year to 5 years). Collaborations with healthcare facilities will be fostered to ensure the provision of comprehensive nutritional counseling and support.

Keywords: Determinants, Malnutrition, HIV, Positive Children Aged 3 Months To -12 Years, Bombo General Military Hospital, Luwero District.

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Background of the study

Malnutrition in HIV/AIDS patients is a serious impediment to achieving the Sustainable Development Goals. This is significant because acute malnutrition places an additional load on already overburdened healthcare facilities once these individuals are admitted. A frequency of 15.4% has been discovered among HIV-positive mothers and children in Northern Uganda. Malnutrition has also been found to be prevalent in 46% of HIV-positive children in the Bushenyi district (Odwee et al, 2020). Furthermore, SAM in Uganda is related to 1.6 million additional morbidity episodes per year with a 258 million US dollar economic cost, and 15% of overall child mortality (Banga et al,2020). These observations appear

to be counterintuitive, given that Uganda is well-known for its excellent soils and high food yield (Odwee et al, 2020). The World Health Organization advises treating severely malnourished children empirically. This is the present procedure in Uganda; but, given the high rates of reported antibiotic resistance, these prescribed medications may no longer be effective there or anywhere else. (Williams et al, 2018). This study aims to investigate the determinants of malnutrition in HIV-exposed and positive children aged 3 months to -12 Years at Bombo General Military Hospital, Luwero District.

Methodology

Study design

The study was a descriptive cross-sectional study that included a quantitative approach. The cross-sectional design was deemed appropriate for the study because of the short time provided for conducting the research at this level of education.

Study area

The study was conducted at Bombo General Military Hospital located in Luwero District. This study will be conducted in a period of two months i.e., from 5th August 2023 to 20th September 2023.

Study population

The study targeted parents or guardians of HIV Positive Children aged (3 months - 12 years) and health workers at Bombo General Military Hospital.

Sample size determination

The sample size was calculated using the sample size formula by Kish Leslie in 1965:

$$n = (Z^2 PQ) / d^2$$

Where:

n = Desired sample size

Z = A Z score at 90%, which is 1.645

d = Permissible error in the estimate, i.e., 10%, which is equal to 0.1

P = A known characteristic of the study population, estimated at 50% since the prevalence rate wasn't known

$$n = (1.645 \times 1.645 \times 0.5 \times 0.5) / (0.1^2)$$

n = 68 respondents

Sampling technique

A non-random sampling technique was used in this study. Respondents were purposively selected, and if they consented to the study, they were guided to answer the questionnaire.

Sampling procedure

The sample was derived from the parents or guardians of HIV-positive children who reported to the hospital and from the health workers at the hospital within the specified period. A maximum sample size of 68 respondents was collected within the mentioned period.

Data collection method

An interview method was used.

Data collection tool

Questionnaires were used for data collection.

Data collection procedure

While collecting data, the researcher presented an introductory letter from Medicare Health Professionals College (School of Clinical Officers) to the medical

superintendent of Bombo General Military Hospital, seeking permission to conduct the study. A structured self-administered questionnaire was designed for respondents. The purpose of the research was clearly explained to the respondents to gain their maximum cooperation. Respondents who consented were interviewed using clear and simple questions. In cases where the respondent failed or found trouble understanding the questions, the researcher explained what was required. Two research assistants were used to collect data.

Study variables

Independent variables

HIV-positive children aged 3 months - 12 years who reported to the hospital with or without signs and symptoms of malnutrition. The independent variables included environmental factors, health care services, and individual factors.

Dependent factors

The most prevalent variable was malnutrition in HIV-positive children.

Quality control

Pretesting research tool

A pilot study was conducted among a few members of the accessible population to assess the validity and reliability of the study. The questionnaire was reviewed by colleagues and other supervisors in school, and any necessary adjustments were made in consultation with the research supervisor before data collection.

Training of research assistants

Research assistants were subjected to tests to ensure they fully understood their roles and how to execute the job. A visiting schedule was established to verify answers to questions and provide feedback.

Giving ample time for data collection

Buffer time was included in the timeline to account for potential delays in the data collection process. For example, absent respondents were visited on another day, and data collection was conducted during working hours.

Clear inclusion and exclusion criteria

Inclusion criteria

The study included all parents and guardians of HIV-positive children aged 3 months - 12 years who were willing and ready to participate.

Exclusion criteria

The study excluded frontline healthcare professionals, healthcare students on clinical placement, and parents or guardians of HIV-positive children aged 3 months - 12 years at Bombo General Military Hospital who were not willing to participate.

Adherence to standard operating procedures (SOPs)

A basic SOP guideline was provided and explained to participants, outlining the purpose of SOPs, scope, responsibilities of participants, trainee assistants, and the researcher, procedures, review and revision, corrective actions, references, and definitions.

Data analysis and presentation

Data was presented in frequency distribution tables. Quantitative data was managed and analyzed using descriptive statistics with Microsoft Excel, including frequency and percentage to describe sample characteristics and major patterns.

Ethical considerations

The research report was approved by the Research Ethical Committee of Medicare Health Professionals College. An introductory letter was obtained from the principal and presented to the office of the medical superintendent at

Results

Socio-demographic data

Table 1: Showing socio-demographic characteristics of caretakers

Variable	Frequency (n)	Percentage (%)
Age (years)		
15-24 years	4	5.9
25-35 years	22	32.4
35-44 years	29	42.7
45 years and above	13	19.1
Gender		
Male	28	41.2
Female	40	58.8
Marital Status		
In union	39	56.8
Not in union	29	43.2
Religion		
Christian	34	50.0
Islam	21	30.3
Pegan (Pagan)	7	10.2
Traditional Believer	6	9.5
Education Level		
Never went to school	12	17.6
Primary	17	25
Secondary	29	42.6
Tertiary/University	10	14.7
Total	68	100.00

Source: Field data, 2023

Below are the study findings for the socio-demographic characteristics of caregivers

According to the table, study results expose a diverse demographic profile among the participants. The majority, at 42.65%, fall within the 35-44 years age group, indicating a significant presence of middle-aged individuals. Gender-wise, females dominate the sample

Bombo General Military Hospital, which allowed the researcher to conduct the study in the facility.

Autonomy

Participants had the freedom to take part in the study for any given period.

Privacy and confidentiality

The names of participants were not disclosed, and each participant was handled individually. Participants' information was kept private and not shared.

Freedom to withdraw without penalty

Participants were free to stop participating at any time without fear of penalty or punishment.

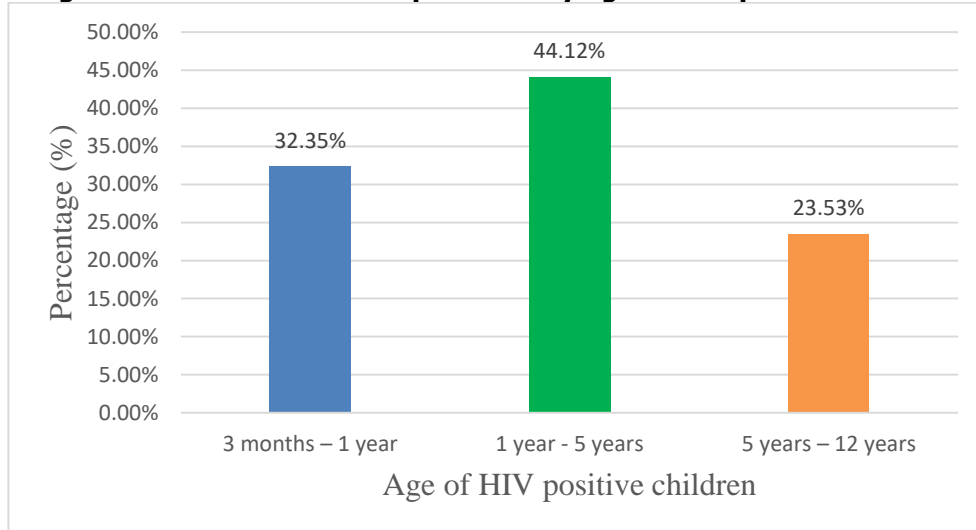
Consent

Informed consent was obtained from the respondents, assuring them of the confidentiality of the study and clarifying that it had no legal implications.

with 58.82%. Marital status reveals that 56.8% of respondents are in a union, and a smaller proportion, 43.2% is not in a union. In terms of religion, Christianity prevails at 50.0%, followed by Islam at 30.3%. Educational levels vary, with 42.6% having completed secondary education and 14.7% having attained Tertiary/University education.

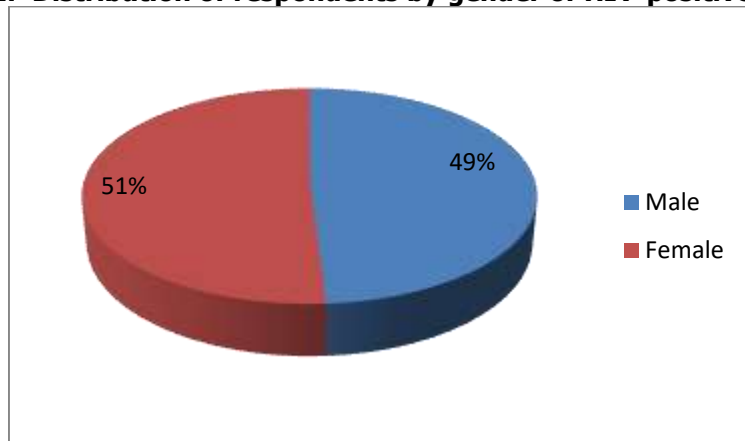
Individual-related factors associated with malnutrition in HIV-exposed and positive children aged 3 Months to 12 Years

Figure 1: Distribution of respondents by age of HIV-positive children



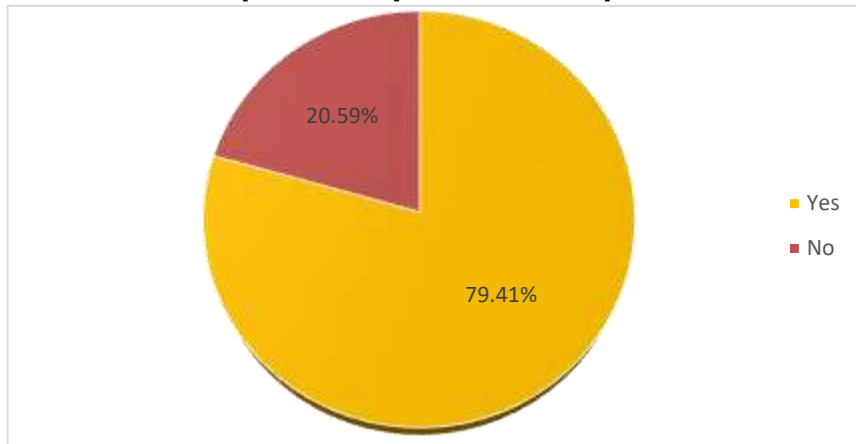
According to Figure 1, 44.12% fell within the age range of 1 year to 5 years, 32.35% of the study children were in the age group of 3 months to 1 year, and 23.53% were aged between 5 years and 12 years.

Figure 2: Distribution of respondents by gender of HIV-positive children



The study sample was nearly evenly split by gender, with 51.47% being female and 48.53% being male.

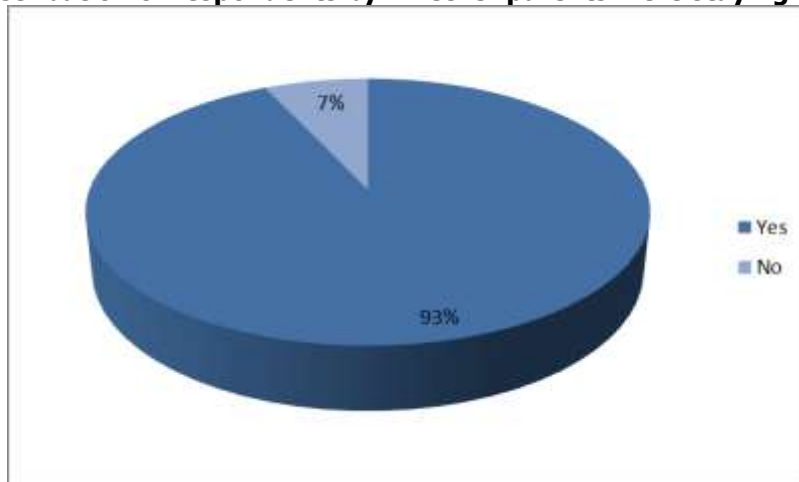
Figure 3: Distribution of respondents by whether both parents of the child were alive



On the issue of whether both parents of the child were alive, study results showed that a substantial majority of participants (79.41%) reported that both parents of the

child were alive whereas the least 20.59% reported that both parents of the child were not alive.

Figure 4: Distribution of respondents by whether parents were staying with the child



In line with whether parents were staying with the child, results showed that the vast majority (92.65%) reported that parents were staying with the child, indicating family

support and caregiving. Only a small percentage (7.35%) indicated that parents were not staying with the child.

Health-related factors associated with malnutrition in HIV-exposed and positive children aged 3 Months to 12 Years

Table 2: showing the results for Health-Related Factors Associated with Malnutrition in HIV exposed and positive Children Aged 3 Months - 12 Years

Variable	Frequency (n)	Percentage (%)
Whether the caretaker lived near a health center in your community		
Yes	45	66.18
No	23	33.82
Total	68	100.00
Whether the caretakers had easy and reliable access to healthcare in their area		
Yes	12	48.53
No	56	51.47
Total	68	100.00
Whether the child has ever suffered from a long-term disease		

Yes	20	29.41
No	48	70.59
Total	68	100.00
Whether the child ever experienced delayed treatment for any disease		
Yes	40	58.82
No	28	41.18
Total	68	100.00
Whether the child currently had any illness		
Yes	15	22.06
No	53	77.94
Total	68	100.00

Source: Field data, 2023

According to Table 2, study results showed that regarding whether the caregiver lived near a health center in the community, the majority (66.18%) of respondents indicated that they did live nearby, while a smaller portion (33.82%) reported living farther away. In terms of having easy and reliable access to healthcare in the area, the findings were surprising, with only 48.53% of respondents stating they had easy and reliable access, while the majority (51.47%) reported difficulties in accessing healthcare services. Regarding the child's health history, a substantial portion (29.41%) of the children had experienced long-term

diseases, while the majority (70.59%) had not. Additionally, a significant number (58.82%) of children had experienced delayed treatment for diseases, which could have implications for their health outcomes and may necessitate improvements in healthcare delivery. Currently, 22.06% of the children were reported as having an illness, while the majority (77.94%) were not.

Environmental factors associated with malnutrition in HIV-exposed and positive children aged 3 Months to 12 Years

Table 3: Results for Environmental Factors Associated with Malnutrition in HIV exposed and Positive Children Aged 3 Months - 12 Years

Variable	Frequency (n)	Percentage (%)
The source of water in the community		
Well	10	14.71
Borehole	28	41.18
Tap	18	26.47
Rain	12	17.65
Total	68	100.00
Which method do you use to purify water for drinking		
Boiling	25	36.76
Using water guard	18	26.47
Filtering	15	22.06
Sedimentation	10	14.71
Total	68	100.00
Whether wash your hands after visiting the latrine		
Yes	60	88.24
No	8	11.76
Total	68	100.00
Whether wash your hands before serving food		
Yes	62	91.18
No	6	8.82
Total	68	100.00

Source: Field data, 2023

According to the study findings, the source of water was identified, and the results revealed that a majority of respondents (41.18%) accessed water from taps, while 26.47% used boreholes, 14.71% relied on wells, and 17.65% collected rainwater. The methods caregivers used

to purify water for drinking were also examined, and it was noted that the most common water purification method was boiling (36.76%), followed by using water guard (26.47%), filtering (22.06%), and sedimentation (14.71%). Concerning whether they washed their hands

after visiting the latrine, the vast majority (88.24%) reported washing their hands after using the latrine, while 11.76% did not. As for hand washing before serving food, a significant number (91.18%) reported doing so, while 8.82% did not.

Discussion

Socio-demographic characteristics of caretakers

According to study results, the largest age group among the participants is the 35-44 years category, which accounts for 42.65% of the sample. This indicates a significant presence of middle-aged individuals in the study. Understanding the age distribution is crucial for several reasons. For instance, it can help tailor interventions and messages to specific age groups, as different age cohorts may have unique needs and perspectives.

The gender distribution in the sample is skewed towards females, with 58.82% of participants being women. This gender imbalance is noteworthy and may have implications for the study's findings. It's important to consider potential gender-related differences in responses or outcomes. Understanding the gender composition can also help address gender-specific issues and concerns in the study's context.

The marital status data shows that 56.8% of participants are in a union (likely married or in a domestic partnership), while 43.2% are not in a union. This information is significant because it highlights the relationship status of the participants. It can be particularly relevant when studying topics related to family dynamics, relationships, or social support.

Christianity is the dominant religion among the participants, representing 50.0% of the sample, followed by Islam at 30.3%. Understanding the religious composition of the participants can be essential for studies related to cultural or religious practices, values, and beliefs. It may also help in addressing potential religious or cultural sensitivities in the research.

The educational background of the participants varies, with 42.6% of the respondents having completed secondary education and 14.7% having attained Tertiary/University education. This information is crucial for gauging the educational diversity of the sample. It can be relevant for studies focusing on literacy, access to information, or the impact of education on various outcomes.

Overall, the demographic information provides a valuable foundation for the study's context. Researchers can use these insights to tailor their research methodologies, questions, and interpretations to account for the unique characteristics and experiences of this diverse study population. Additionally, these findings can guide the development of targeted interventions or policies that consider the specific needs and preferences of different demographic groups within the sample.

Individual factors associated with malnutrition in HIV-exposed and positive children aged 3 Months to 12 Years

Most 44.12% fell within the age range of 1 year to 5 years, 32.35% of the study children were in the age group of 3 months to 1 year, and 23.53% were aged between 5 years and 12 years. This implies that most malnourished HIV-exposed and positive children were aged 1 year to 5 years. This could be because those between 1 year to 5 years have been diagnosed with HIV infection. This is similar to a study done by Sunguya et al, (2014) which reported that 49% of malnourished children fell within the age range of 1 year to 5 years, 36% of the study children were in the age group of 3 months to 1 year, and 15% were aged between 5 years and 12 years.

The majority 51.47% of the respondents were female and 48.53% of respondents were male. This implies that the majority of children were female. This could be because based on statistics majority of children born in health Centres are female compared to their male counterparts. This is in agreement with a study done by Sunguya et al, (2014) revealed that of HIV-exposed and positive children 50.7% of them are female whereas 49.3% are male.

The majority 92.65% reported that parents were staying with the child, indicating family support and caregiving. Only a small percentage 7.35% indicated that parents were not staying with the child. This implies that the majority of malnourished HIV-exposed and positive children were staying with their parents. This could be because the parents of malnourished children were poor and could not afford to feed their children on a balanced diet. This is in line with a study done by Asfaw et al, (2015) which revealed that the majority 89.5% of participants reported that parents were staying with the child, indicating family support and caregiving. Only a small percentage (10.5%) indicated that parents were not staying with the child.

Health-related factors associated with malnutrition in HIV-exposed and positive children aged 3 Months to 12 Years

The majority 66.18% of respondents indicated that they did live nearby, while a smaller portion 33.82% reported living away from the health center. This implies that the majority of the caretakers lived nearby. This could be because they became lazier in taking their children to the health centers since they were living near the hospital. This is in agreement with a study done by Tette et al. (2015) which revealed that the majority (60%) of participants indicated that they did live nearby, while a smaller portion (40%) reported living farther away.

The majority 51.47% of respondents reported difficulties in accessing healthcare services while only 48.53% of respondents stated they had easy and reliable access. This implies that caretakers found challenges in accessing the hospital. This could be because of the negligence of the caretakers in seeking healthcare services. This is in line with a study done by Tette et al. (2015) which reported that the majority (57%) of participants reported difficulties

in accessing healthcare services while only 48.53% of participants stated they had easy and reliable access. The majority 70.59% had not experienced long-term diseases whereas a substantial portion (29.41%) of the children had experienced long-term diseases. This implies that malnourished HIV-exposed and positive children had opportunistic infections. This is in agreement with a study done by Mda et al., (2018) which revealed that regarding the child's health history, the majority (66%) of participants had not experienced long-term diseases and the least 36% of the children had experienced long-term diseases.

The majority 77.94% did not have any illness while 22.06% of the children were reported as having an illness. This could be because they had exclusive breastfeeding for six months hence their immunity was stronger. This is similar to a study done by Mda et al., (2018) which revealed that the majority (70%) were not having an illness while the least 30% of the children were reported as having an illness.

Environmental factors associated with malnutrition in HIV exposure and positive

The majority 41.18% of respondents accessed water from taps, while 26.47% used boreholes, 14.71% relied on wells, and 17.65% collected rainwater. This implies that the majority of caretakers accessed clean water. This could be because they accessed water from taps which is well treated. This is in line with a study done by Vilcins et al, (2018) which revealed that the methods caregivers used to purify water for drinking were also examined, and it was noted that the most common water purification method was boiling (36.76%), followed by using water guard (26.47%), filtering 22.06%), and sedimentation (14.71%). Concerning whether they washed their hands after visiting the latrine,

The majority 88.24% reported washing their hands after using the latrine, while 11.76% did not. As for hand washing before serving food, a significant number (91.18%) reported doing so, while 8.82% did not. This implies that caretakers washed their hands after using the latrine. This could be because they accessed clean water from different water sources. This is in agreement with a study conducted by Vilcins et al, (2018) which revealed that the majority of 70% reported washing their hands after using the latrine, while 17% did not. As for hand washing before serving food, a significant number (5%) reported doing so, while 8% did not

Conclusion

Several factors associated with malnutrition in HIV-exposed and positive children aged 3 months to 12 years were examined. Individual-related factors included age distribution, gender balance, the impact of parental status, and the importance of caregiver support.

Environmental factors were also scrutinized, highlighting the importance of healthcare access and delivery. While a majority lived near healthcare centers, access challenges

were evident, emphasizing the need for improved healthcare services.

Health system-related factors included access to clean water sources such as taps and hygiene practices hand washing after latrine use and before serving food).

Recommendation

Shortly, the Government of Uganda through the Ministry of Health should enhance Pediatric Nutrition Programs by developing and implementing targeted nutrition initiatives tailored to the diverse age groups of HIV-exposed and positive children, with a specific emphasis on early childhood nutrition (1 year to 5 years). Collaborations with healthcare facilities will be fostered to ensure the provision of comprehensive nutritional counseling and support.

Furthermore, the government will extend orphan support services by strengthening social support systems for children who may lose one or both parents due to HIV/AIDS. This will involve collaborating with the Ministry of Gender, Labor, and Social Development to provide counseling, financial assistance, and access to essential social services.

Caregiver Training and Support programs should be developed to promote optimal child nutrition and health. Adequate resources and support will be provided to caregivers, with particular attention given to households where parents may not be present.

The National Water and Sewage Corporation should prioritize improving water access in collaboration with local authorities and the Ministry of Water and Environment. Efforts will be concentrated on expanding access to clean and safe water sources, especially in communities where boreholes and wells may be less accessible.

In terms of community health awareness, active involvement will be taken to raise awareness about the significance of healthcare access and proper hygiene practices. Community members will be encouraged to seek healthcare services as needed and to adopt safe water and hygiene practices for a healthier future.

Additionally, NGOs will actively engage in future community empowerment initiatives. These programs will center on capacity-building, income generation, and livelihood support, indirectly contributing to improved healthcare access and better nutrition for vulnerable households.

By implementing these forward-looking recommendations, all stakeholders will be able to significantly reduce malnutrition risks in HIV-exposed and positive children, ultimately enhancing their overall health and well-being while strengthening healthcare and environmental systems not only in the Luwero District but also across the nation.

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ABBREVIATIONS AND ACRONYMS

ARV	:	Antiretroviral drugs
FP	:	Family Planning
Hep B	:	Hepatitis B
HIV/AIDs	:	Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome
Kg	:	Kilogram
Lab	:	Laboratory
MAM	:	Moderate Acute Malnutrition
MDGs	:	Millennium Development Goals
MoH	:	Ministry of Health
%	:	Percentage.
PCR	:	Polymerize Chain Reaction
POPE	:	Personal Protective Equipment
RH	:	Reproductive Health
SAM	:	Severe Acute Malnutrition
SOPs	:	Standard operating procedures
UNICEF	:	United Nations International Children Emergency Fund
WHO	:	World Health Organization

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Conflict of interest

The author declares no conflict of interest.

Author Biography

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