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Knowledge, attitudes, and practices of mothers towards childhood Immunizations at Young Child Clinics of Mildmay Uganda Hospital, Wakiso District. A cross-sectional study.

Stanley Acac, Hasifa Nansereko*, Jane Frank Nalubega, Edith Akankwasa
Mildmay Uganda School of Nursing and Midwifery

Abstract.

Background.

Globally, it is estimated that around 22.6 million infants were partially protected by immunization services. In Uganda, only 52 percent of children aged 12-23 months were fully vaccinated. This assessed the knowledge, attitudes, and practices on immunization among mothers attending the young child clinic at Mildmay Uganda hospital.

Methods.

A descriptive cross-sectional study design was employed, using quantitative data collection methods. Over five days, 30 mothers were selected through simple random sampling. Data were gathered using a structured, closed-ended questionnaire and analyzed manually, with results entered into Microsoft Excel (2013) and presented using tables, pie charts, and graphs.

Results.

Most of the participants were aged 25-29(40%) and had secondary education (50%), and 100,000-300,000 Ugandan shillings monthly (47%). All mothers were aware of childhood immunization,70% citing disease prevention as its purpose, and all knew the first dose is given at birth. However, 53% were unaware of the required routine visits. Most received information through radio or TV (60%), while 80% believe in the benefits of vaccination,60% felt unsafe vaccinating their children, and 70% opposed compulsory vaccination. Additionally, 53% didn't advise others to vaccinate. Regarding practices, many missed vaccine schedules (63%), skipped vaccines (67%) or didn't complete them (53%), and 87% used pain relievers post-vaccination

Conclusion.

Mothers had general awareness of childhood immunization, but gaps in knowledge, negative attitudes, and poor practices hindered full adherence to vaccination schedules.

Recommendation.

There is a need for targeted health education and community outreach to improve mothers' knowledge, attitudes, and practices toward childhood immunization.

Keywords: *Childhood immunization, Maternal knowledge, Attitudes towards vaccination, Immunization practices, Young Child Clinics, Mildmay Uganda Hospital, Wakiso District.*
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Corresponding Author: Hasifa Nansereko
Email: ***haffyhussein65@gmail.com***
Mildmay Uganda School of Nursing and Midwifery

Background.

Childhood immunization refers to the process by which children are made immune or resistant to infectious diseases, typically through the administration of vaccines. The immunization of children is typically done according to a national schedule, which is often integrated into maternal and child health services and offered through healthcare facilities such as young child clinics. Mothers, being the primary caregivers, play a vital role in ensuring the timely and complete immunization of their children. Their knowledge, attitudes, and practices (KAP) greatly influence vaccine uptake.

The World Health Organization (WHO) defined immunization as the process whereby a person is made to receive immune or resistant to an infectious disease, typically by the administration of a vaccine. These vaccines

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help to stimulate the body's immune system to protect the person against subsequent infection or disease. Vaccinating children with appropriate vaccines also would significantly reduce the costs of disease treatment and rates of disease and, therefore, improve the quality of the child's life.

Globally, it is estimated that around 22.6 million infants were partially protected. In 2019, routine immunization services such as the DTP3 vaccine did not reach about 19.5 million children under 1 year of age worldwide (World Health Organization, 2018). About 70% of these children are in 10 countries, and more than 50% of them are living in Africa, including Ethiopia, Kenya, and South Africa (Haeuser et al., 2025). Previous studies carried out worldwide showed that the death of children is more common in underdeveloped countries. Among 9 million deaths of children worldwide as a result of VPDs, a higher proportion occurred in sub-Saharan Africa, which was 4.4 million. From this, about 472,000 children pass away every year before their fifth birthday, largely from VPDs in Ethiopia. (World Health Organization, 2018)

Despite the implementation of these strategies to end all preventable newborn and child deaths by 2035, to accomplish universal coverage in the EPI and reduce under-five mortality, Vaccination coverage in Tanzania was found to be less than expected one and under-five mortality is also higher. According to the Tanzanian Mini Demographic and Health Survey (TMDHS) report, in 2019 showed that under-five mortality rate was 55 deaths per 1000 live births, close to 2 in 10 children (19%) have not received any vaccinations at all and only 4 out of 10 children (43%) have received all basic vaccinations (Gebrehiwot et al., 2025). In Uganda, the latest coverage data indicates that routine immunization coverage remains suboptimal, with only 52 percent of children aged 12-23 months being fully vaccinated. Whereas almost all (94 percent) receive the BCG vaccine, only 72 percent receive DPT 1-3 vaccinations, 63 percent receive polio 1-3, and 76 percent receive the measles vaccine. Four percent of children aged 12-23 months have not received any vaccinations (UDHS 2021). The disparity between the high coverage of first vaccines (DPT1 and polio vaccine: 93 percent) and low coverage of follow-on vaccines (DPT3: 63%) reflects a high dropout rate (30%), which remains a challenge to strengthening routine immunization services in Uganda (Ssebagereka et al., 2024)

In 2022, the DTP3 coverage rate was estimated at 78%, meaning 22% of children had not received the third dose of DPT3 (status of Ugandan child 2015).

At Mildmay Uganda hospital, the evaluation of knowledge, attitudes, and practices of mothers on immunization is not well understood due to a lack of data. This assessed the knowledge, attitudes, and practices on immunization among mothers attending the young child clinic at Mildmay Uganda hospital.

Methodology.

Study Design and Rationale

The study was a cross-sectional quantitative study design.

Study Setting and Rationale

The study was conducted at Mildmay Uganda Hospital, situated on Naziba Hill, Lweza, along the Kampala-Entebbe Road, approximately 12 km from Kampala. Its postal address is P.O. Box 24985, Wakiso, Uganda. The geographical coordinates of the hospital are approximately 0.22658°N latitude and 32.5507°E longitude, The hospital serves both rural and urban populations including those from neighboring districts such as Mukono to the East, Mpigi to Southwest and Mityana in the North, it receives an average of 100 patient daily offering a range of services such as outpatient department which wass well-equipped with basic diagnostic tools including weighing scales and height meters, other services include inpatient care, antenatal services, immunization, laboratory diagnostics, HIV care (ART clinic), TB management, family planning and health education. It had approximately 30 health workers, including clinical officers, nurses, midwives, laboratory technicians, and nutritionists.

Study Population.

The study comprised mothers attending the Young Child Clinic (YCC) at Mildmay Uganda Hospital. The study targeted only mothers attending YCC because they were more prone to not taking their children for immunization due to inadequate knowledge, attitudes, and practices, which increased the risk of their children becoming severely ill.

Sample Size Determination

The sample size was calculated using the formula developed by Yamane & Taro (1967), given by:

n=N/ (1+Ne2)

Where;

n =sample size

N=population size (32)

e=desired level of precision (0.05)

n=32/ (1+32*(0.05)2)

d=0.05 was the acceptable error of estimation at a 95% confidence interval

Therefore

n= 30.

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Therefore, the sample size for this study was 30 respondents.

Sampling procedure.

The study used a simple random sampling technique. To select participants, the researcher prepared pieces of paper of similar size labeled "Yes" and "No." Respondents were asked to pick papers from an enclosed box each day during data collection, and those who picked papers labeled "Yes" were selected to participate. This process was repeated daily, sampling four respondents per day for eight days, resulting in a total sample of 30 respondents.

Inclusion and exclusion criteria.

Inclusion

Inclusion criteria are composed of all literate Ugandan mothers aged 21 to 40 years with children below attending YCC at Mildmay Uganda hospital who consent.

Exclusion criteria

Excluded all non-Ugandan mothers aged 21 to 40 years with children below attending YCC at Mildmay Uganda hospital.

Study variables

Dependent variable:

The dependent variable was the level of childhood immunization among children of Ugandan mothers aged 21 to 40 years attending the Young Child Clinic at Mildmay Uganda Hospital.

Independent Variables

The independent variables were the knowledge, attitudes, and practices of Ugandan mothers aged 21 to 40 years attending the Young Child Clinic at Mildmay Uganda Hospital.

Research Instrument

Questionnaires were used as tools for data collection because they allowed the researcher to participate actively by providing clarifications and explanations where needed. Additionally, the questionnaires enabled the collection of data from a large number of respondents within a short period. They were designed to obtain information that would objectively answer the research questions.

Data Collection Procedure

Data collection started after the researcher presented an introductory authorization letter to the administration of Mildmay Uganda Hospital. Since the questionnaire was in English, literate respondents were given the questionnaire to complete independently. Data were collected from four respondents each day over eight working days to cover a total of thirty respondents.

Data management and analysis.

Data management

The filled questionnaires were retrieved, counted, checked for completeness, and edited after each day of data collection to ensure all were returned. They were then coded and kept in a safe place as a backup. The raw data were securely locked in a cupboard for security purposes.

Data analysis

Data from the questionnaires were manually analyzed, and the findings were then entered into Microsoft Excel (2016). The results were presented in the form of tables, figures, pie charts, and statistical texts showing respondents' responses in frequencies and percentages.

Quality Assurance

Validity

This was ensured by designing questions aligned with the research objectives and collaborating with the supervisor to confirm that the tool had both face and construct validity.

Reliability

The questionnaires were pre-tested at Ndejje Health Centre IV among 10 selected respondents, and necessary corrections were made. They were then re-tested with 5 respondents to make final adjustments before the formal study.

Ethical approval.

This research study was conducted purely for academic purposes, and the views solicited from respondents were used solely for this reason. To build respondents' confidence, the researcher obtained an introduction letter from the institutional authorities, which was presented to the administration of the study area to obtain permission to conduct the study.

Informed consent.

Informed consent was sought from all respondents who spoke English to ensure effective communication. Participants were informed about the importance of the research, and only those willing were allowed to participate. Additionally, assurance was given that the information

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obtained would be kept confidential to prevent victimization, and once the findings were compiled, a copy of the report with outcomes and possible solutions was made available to their administration.

RESULTS:

Social demographic characteristics

Table 1 showing the social demographic characteristics of the respondents, N=30

Variable	Category	Frequency(f)	Percentage (%)
Age	21-24 years	9	30
	25-29 years	12	40
	30-35 years	6	20
	36-40 years	3	10
Education level	Primary school	7	23
	Secondary school	15	50
	Tertiary	8	27
Monthly income	Less than 100,000	4	13
	100,000-300,000	14	47
	Above 300,000	12	40
Age of the child	0-6 months	12	40
	6-12 months	13	43
	12-24 months	3	10
	2-5 years	2	7

Table 1, majority of the respondents, 12(40%) were 25-29 years, 9(30%) were 21-24 years, 6(20%) were 30-35 years, while the minority, 3(10%) were 36-40 years.

Most of the respondents, 15(50%) were secondary school leavers, 8(27%) had tertiary education, while the least, 7(23%) had primary education.

Most of the respondents, 14(47%) earned 100,000-300,000 monthly, 12(40%) earned above 300,000 monthly, and the least, 4(13%) earned less than 100,000 monthly.

Majority of respondents, 13(43%) had children of 6-12 months, 12(40%) had children of 0-6 months, 3(10%) were 12-24 months, while minority, 2(7%) had children of 2-5 years.

The knowledge of mothers with children attending the Young Child Clinic (YCC) at Mildmay Uganda Hospital regarding childhood immunization.

Figure 1 Shows whether respondents had ever heard of childhood immunization, N=30

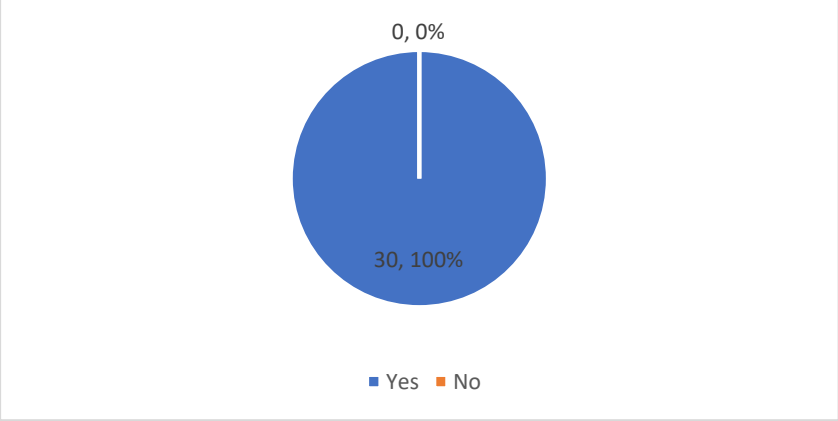

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Figure 1 showed that all the respondents, 30(100%), had ever heard of childhood immunization.

Table 2 shows the main purpose of immunization, N=30

Variable	Frequency (f)	Percentage (%)
To prevent infectious diseases	21	70
To treat existing illnesses	0	0
To improve appetites	3	10
I don't know	6	20

Table 2 indicates that the majority of the respondents, 21(70%), mentioned preventing infectious diseases as the purpose of immunization, 6(20%) didn't know, while the minority, 3(10%), mentioned improving appetite.

Figure 2 shows the number of visits to complete routine immunization, N=30

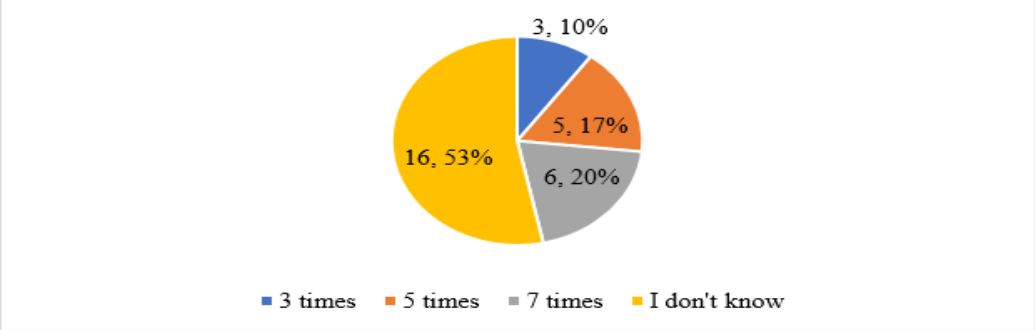

Figure 2 shows that the majority of the respondents, 16(53%), didn't know the number of visits for routine immunization, 6(20%) mentioned 7 times, 5(17%) mentioned 5 times, while a minority, 3(10%), mentioned 3 times.

Table 3 shows the source of information about childhood immunization, N=30

Variable	Frequency (f)	Percentage (%)
Health workers	9	30
Radio/television	18	60
Internet	0	0
Community meetings	3	10

Table 3 shows that the majority of the respondents, 18(60%), got information on immunization from radio/television, 9(30%) mentioned health workers, while the minority, 3(10%) mentioned community meetings.

The attitudes of mothers with children towards childhood immunization at the Young Child Clinic of Mildmay Uganda Hospital.

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Table 4 shows the attitudes N=30

Category	Variable	Frequency(f)	Percentage (%)
Whether vaccinations are beneficial	Yes No	24 6	80 20
Whether respondents felt safe to vaccinate their children	Yes No	12 18	40 60
Support for compulsory vaccination by the Ministry of Health	Yes No	9 21	30 70
Whether respondents advise relatives and family to vaccinate their children	Yes No	14 16	47 53

Table 4, majority of the respondents, 24(80%) believed vaccinations were beneficial, while minority 6(20%) disagreed.
The majority of respondents, 18(60%), didn't feel safe to vaccinate their children, while a minority, 12(40%), agreed.
The majority of respondents, 21(70%), didn't support compulsory vaccination by the Ministry of Health, while a minority, 9(30%), supported the idea.
The majority of respondents, 16(53%), didn't advise relatives and family to vaccinate their children, while a minority, 14(47%), agreed.

The childhood immunization-related practices of mothers with children attending the Young Child Clinic at Mildmay Uganda Hospital

Table 5 shows the practices N=30

Category	Variable	Frequency(f)	Percentage (%)
Whether respondents' children received the required vaccines	Yes No	14 16	47 53
Whether respondents followed compulsory vaccination programs listed in the schedule	Yes No	11 19	37 63
Whether respondents looked for other vaccines available to the child	Yes No	10 20	33 67
Whether respondents used pain relievers for swelling and pain after vaccination	Yes No	26 4	87 13

Table 5 revealed that the majority of the respondents, 16(53%), mentioned that their children didn't receive the required vaccines, while a minority, 14(47%), mentioned that their children received the required vaccines.
The majority of respondents, 19(63%), didn't follow compulsory vaccination programs listed in vaccination schedules, while a minority, 11(37%), followed schedules.
The majority of respondents, 20(67%), never looked for other vaccines available to their children, while a minority, 10(33%), agreed.
The majority of respondents, 26(87%), used pain relievers for swelling and pain after vaccination, while a minority, 4(13%), disagreed.

Discussion of results.

The knowledge of mothers with children attending the Young Child Clinic (YCC) at Mildmay Uganda Hospital regarding childhood immunization.

Regarding knowledge, all the respondents, 30(100%), had ever heard of childhood immunization. This might have contributed to respondents' uptake of vaccination services, since they had awareness of the services. The findings of the study were in agreement with the study done by Abdullah & Mustafa (2022), where findings showed that **mothers were knowledgeable** about child immunization.

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Additionally, the majority of the respondents, 21(70%), mentioned preventing infectious diseases as the purpose of immunization. This might have influenced respondents to closely follow the routine immunization schedules for their children. The findings of the study were in alignment with the study done by Verulava et al. (2019), where findings showed that **participants agreed** that diseases can be prevented through vaccination.

Concerning immunization, all the respondents, 30(100%), mentioned that the first dose of immunization should be at birth. This could be because respondents had received this information previously, which might have influenced their adherence to vaccination schedules. The findings of the study were similar to the study done by Abdullah & Mustafa (2022), where findings showed that **mothers were knowledgeable** about child immunization.

Further findings revealed that the majority of the respondents, 16(53%), didn't know the number of visits for routine immunization. This might have contributed to respondents' failure to follow the vaccination schedules accurately. The findings of the study were similar to the study done by Birhanu et al. (2016), where findings showed that **mothers had low knowledge** about vaccination.

When they were asked, the majority of the respondents, 18(60%), got information on immunization from radio/television. This could be because this was the most accessible information source, which might have influenced respondents' uptake of vaccination services. The findings of the study were similar to the study done by Alfahl et al. (2017), where results showed that **mothers** received information from medical staff, followed by **social media.**

The attitudes of mothers with children towards childhood immunization at the Young Child Clinic of Mildmay Uganda Hospital

Regarding vaccinations, the majority of the respondents, 24(80%), believed vaccinations were beneficial. This might have influenced respondents' practices to take up vaccination services. The findings of the study were in agreement with the study done by Alfahl et al. (2017), where findings showed that parents believed vaccines were beneficial.

Furthermore, the majority of respondents, 18(60%), didn't feel safe to vaccinate their children. This might have influenced respondents to shun away from vaccination services for their children. The findings of the study were contrary to the study done by Alfahl et al. (2017), where findings showed that parents felt safe when vaccinating their children.

About compulsory vaccination, the majority of respondents, 21(70%), didn't support compulsory vaccination by the Ministry of Health. This could be because respondents never believed in compulsory vaccination as being safe for their children. The findings of the study were similar to the study done by Alfahl et al. (2017), where findings revealed that parents supported government-mandated immunization programs.

In other findings, the majority of respondents, 16(53%), didn't advise relatives and family to vaccinate their children. This could be because respondents doubted the safety of the vaccines injected into their children.

The childhood immunization-related practices of mothers with children attending the Young Child Clinic at Mildmay Uganda Hospital

Concerning vaccination, the majority of the respondents, 16(53%), mentioned that the children didn't receive the required vaccines. This could be because respondents did not fully follow the immunization schedule. The findings of the study were contrary to the study done by Adefolalu et al. (2019), where findings showed that **mothers had fully immunized their children.**

Additionally, the majority of respondents, 19(63%), didn't follow compulsory vaccination programs listed in vaccination schedules. This might have affected the dosage of the vaccines, which could have interrupted the immunization program for their children. The findings of the study contradicted the findings of the study done by Alabi et al. (2024), where findings showed that mothers' **children** were fully immunized, showing room for improvement.

Regarding vaccines, the majority of respondents, 20(67%), never looked for other vaccines available to their children. This could be because respondents were not willing to closely follow the vaccination schedule for their children. The findings of the study were similar to the study done by Alfahl et al. (2017), where findings showed that mothers had barriers like distance that hindered their accessibility to vaccines for their children.

Lastly, the majority of respondents, 26(87%), used pain relievers for swelling and pain after vaccination. This could be because respondents' children went through feverish and painful moments, which prompted them to go for pain relievers. The findings of the study were in agreement with the study done by Alfahl et al. (2017), where findings

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showed that **mothers** used pain relievers to ease swelling and fever following vaccination.

Conclusion

Regarding knowledge, the study found that all respondents had heard about childhood immunization. Many mothers knew that immunization helps prevent infectious diseases and that the first dose should be given at birth. Some mothers did not know the number of visits required for routine immunization. Most mothers received information about immunization from the radio and television.

Concerning attitudes, most mothers believed vaccinations are beneficial. Some mothers did not feel safe vaccinating their children. Many did not support compulsory vaccination by the Ministry of Health. Some mothers did not advise relatives and peers to vaccinate their children.

Pertaining to practices, some mothers reported that their children did not receive all the required vaccines. Many did not follow the compulsory vaccination schedules. Most mothers did not seek out other vaccines available to their children. Many mothers used pain relievers to manage swelling and pain after vaccination.

Limitations of the study

The study had a small sample size of only 30 respondents, which limits the generalizability of the findings to a wider population.

Data collection relied on self-reported information, which is subject to recall bias and social desirability bias, potentially affecting accuracy.

The study was conducted in a single health facility (Mildmay Uganda Hospital), limiting its applicability to other settings with different characteristics.

Its cross-sectional design prevents the establishment of causal relationships between knowledge, attitudes, practices, and immunization outcomes.

The study did not control for potential confounding variables such as education level, income, or access to healthcare services, which could have influenced the results.

Recommendations for the study

The Ministry of Health should strengthen public health education campaigns to address gaps in detailed knowledge about immunization schedules and the importance of completing all vaccine doses.

Healthcare providers should intensify health education during clinic visits, emphasizing the number of required immunization visits and the benefits and safety of vaccines. They should also create opportunities for mothers to ask questions and express concerns in order to build trust and correct misinformation.

Community leaders and local government authorities should work closely with health workers to promote community-based outreach programs that encourage full participation in routine immunization services.

Mothers and caregivers should be encouraged to actively seek immunization information and to share positive messages within their communities.

Acknowledgement.

I want to thank God from the bottom of my heart as I express my sincere, deepest gratitude to his endless grace for enabling me to accomplish this research and this course.

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May God richly bless them all.

LIST OF ABBREVIATIONS AND ACRONYMS

BCG: Bacillus Calmette-Guérin
DPT: Diphtheria, Pertussis, Tetanus
DPT3: Diphtheria-tetanus-pertussis 3
EPI: Expanded Program on Immunization
Hept B: Hepatitis B
KAP: Knowledge, Attitude, and Practice
MOH: Ministry of Health
OPV: Oral Polio Vaccine
TMDHS: Tanzanian Mini Demographic and Health Survey
UDHS: Uganda Demographic and Health Survey
UNEPI: Uganda National Expanded Program for Immunization
UNICEF: United Nations International Children's Emergency Fund
VPD: Vaccine-preventable diseases
WHO: World Health Organization

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Conflict of interest.

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Availability of data.

Data used in this study are available upon request from the corresponding author.

The author's contribution.

SA designed the study, conducted data collection, cleaned and analyzed data, drafted the manuscript, and HN supervised all stages of the study from conceptualization of the topic to manuscript writing and submission.

Authors biography

Stanley Acac is a student of a diploma in Nursing extension at Mildmay Uganda School of Nursing and Midwifery.
Hasifa Nansereko is a research supervisor at Mildmay Uganda School of Nursing and Midwifery.

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