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Factors Affecting Uptake of Measles-Rubella Vaccination at Lubaga Hospital, Kampala District. A cross-sectional study.

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Abstract.

Background: The purpose of the study was to determine the factors affecting uptake of measles – rubella vaccination at Lubaga Hospital, Kampala District.

Methodology: A descriptive cross-sectional study design that enrolled a sample size of 30 respondents using a simple random sampling method. Data was collected using a researcher – administered structured questionnaire. The data obtained was analyzed and presented in tables and graphs using Microsoft Excel 2016.

Results: Results of the study revealed that caretaker-related factors were; 73.3% knew that the MR vaccine is offered at 9 months only, and 56.7% had attended 1 – 3 antenatal visits, and 56.7% had forgotten the return date for MR vaccination. Health facility related factors were; 70% were living within a distance of 5 – 10 kilometres from health facility, 60% reported that operating schedules of the immunization clinic are not favourable, 76.7% reported that the waiting time at the immunization services was 30 minutes to – 2 hours and vaccine related factors were 73.3%) reported that fear of side effects prevent them from seeking MR for their children, 66.7% disagreed that MR vaccine is effective, 60% were not sure whether MR can harm the child.

Conclusion: The low uptake of measles rubella vaccines is associated with caretaker, health facility-related, and vaccine-related factors.

Recommendation: The Ministry of Health and Lubaga hospital should intensify the health education campaigns about the MR vaccine to increase awareness on the recommended number of doses, effectiveness, and safety of the vaccine.

Keyword: Uptake of Measles-Rubella Vaccination, Lubaga Hospital, Kampala District

Background.

Measles – Rubella (MR) vaccine is a live and active immunizing agent used to prevent infection by the measles and rubella viruses (Ahmed, 2019). Measles and rubella are airborne viruses, and they remain one of the commonest and highly infectious diseases. Measles presents with fever, cough, coryza, conjunctivitis, and maculopapular rash, and rubella presents with similar milder symptoms (Mensah & Gyasi, 2022). Due to related presentation of cases, in 2012, the World Health Organisation (WHO) endorsed the Global Vaccine Action Plan that advocated for the use of the measles – rubella vaccine instead of the initial measles vaccine for children aged 9 months to 15 years (Mkopi et al, 2021). The WHO recommends that children receive two doses of the MR vaccine in order to attain effective protection of children against measles and rubella (United Nations Children Fund (UNICEF), 2019).

Globally, the uptake of the first doses of MR is at 85%, which falls drastically to 67% for the second doses (Ogutu et al, 2023). In Europe, the completion of MR is at 92%, and in Asia, it is at 53% due to awareness and accessibility differences (WHO, 2024). This low uptake of the MR has resulted in more than 140,000 measles cases and deaths annually, with 95% of cases occurring in low-income countries (Dalaba, Ane & Bobtoya, 2023). Lack of caretaker knowledge about appropriate vaccination age, unavailability of vaccine, having insufficient numbers of children waiting to warrant multidose vial use, and long clinic waiting times are commonly associated with low uptake of MR (Magodi et al, 2018).

The African region has shown slow progress in the immunization of children against MR, with the estimates ranging from 56% to 85% due to political instabilities in various countries (Kanyiru, Kikuvi & Jomo, 2019). The non-uptake of MR is caused by false messages linking MR vaccines to infertility, the short duration for implementation of campaign activities, and low awareness of the campaign and misunderstanding of the benefit of the vaccine among parents, insufficient MR vaccine during vaccination days, and long waiting times during vaccine days are some of the reasons for poor uptake (Mkopi et al, 2021).

Across Sub-Saharan Africa, like Ghana, perceptions that the MR vaccine is harmful to the child affected vaccine uptake among children in more than 60% of the communities (Dalaba et al, 2023). Besides that, long distances to health facilities and unfavorable operating times affect the uptake of MR, which facilitates the occurrence of measles outbreaks (Melis et al, 2023). In East Africa, for example, Kenya, the uptake of the MR vaccine is at 45.1%, extremely below the 80% coverage target of the Ministry of Health (Kenya Health Information System, 2021). The uptake of MR has been affected by the low education level of caregivers, social myths and misconceptions about the vaccine, fear of side effects, inaccessibility to health care facilities, long waiting times at the health facility, and health education (Munyithya, 2023).

In Uganda, the MR vaccine was introduced in 2019 to substitute ordinary measles in a nationwide vaccination campaign that targets over 18 million children below the age of 15 years (Ministry of Health, 2019). However, after the immunization campaigns, hesitance to receive the consecutive doses of MR was notified results into recurrent outbreaks of measles and rubella, for example Measles outbreak in Semuto Sub County in Nakaseke District between June and August 2021, which infected more than 209 children (Nsubuga et al 2022). During the campaigns, parents accepted vaccination of their children due to fear of arrest by authorities, which were absent post-campaign. This led to rejuvenation of their negative beliefs, accessibility challenges, and long waiting times that led to hesitance and refusal to seek consecutive MR vaccines (Mensah & Gyasi, 2022). The purpose of the study was to determine the factors affecting uptake of measles – rubella vaccination at Lubaga Hospital, Kampala District.

Methodology.

Study design.

The study adopted a descriptive cross-sectional design and quantitative data collection methods. A descriptive study design was used to describe the association between the factors and uptake of the measles–rubella vaccine. Cross sectional approach was used because it took a short time to collect the data, as well as minimizing the expenditures on data collection.

Study setting.

The study was carried out at Lubaga Hospital, sometimes known as Uganda Martyrs' Hospital Lubaga. It is located on Lubaga Hill, Lubaga Division, Kampala District, approximately 5.5 kilometres southwest of Mulago National Referral Hospital and nearly 5 kilometres from Kampala City Centre. It is a private, not-for-profit hospital owned by the Roman Catholic Archdiocese of Kampala with a bed capacity of 274. It offers both general and specialized medical, surgical, pediatric, gynecological, radiology, and laboratory services. The hospital offers immunization services from Monday to Friday, with a higher incidence of many children who do not receive measles – rubella. The study area was used because it offered an adequate number of participants to be involved in the study.

Study population.

The target population of the study was caretakers of children below 2 years; the accessible population was caretakers of children below 2 years at the immunization clinic at Lubaga Hospital.

Sample size determination.

A study population of 30 respondents was selected based on UHPAB research guidelines. The sample size is selected because it was adequate representation of the study population.

Sampling procedure.

The study used a simple random sampling method because it offered equal opportunity for all individuals to be involved in the study. The process involved the researcher making 60 pieces of similar-sized paper, of

which 30 were written on **HH** and 30 were written on **H.** The papers were folded evenly and put in a small bucket, where they were mixed thoroughly. Caretakers who accepted to participate in the study were asked to pick a single piece of paper, and all those selected **H** were enrolled in the study until a sample size of 30 was attained.

Inclusion criteria.

Caretakers of children aged 9 months to 24 months, aged above 18 years, and who voluntarily consented to participate in the study were involved.

Study variables.

Independent variables

Caretaker-related factors: Gender, age, level of education, knowledge about the MR vaccine, number of antenatal visits attended, decision-making power, and forgetting of return dates.

Health facility-related factors: Availability of vaccines, distance of home to health facility, operation schedules, attitude of health workers, counselling on MR vaccines, and waiting times.

Vaccine – related factors: Fear of side effects, effectiveness of the vaccines, frequency of vaccination, and perceived harmful effects of MR vaccines.

Dependent variable.

Uptake of measles – rubella vaccination**.**

Research Instrument.

Data collection was done using a structured questionnaire that was divided into four sections: demographic characteristics, caretaker-related factors, health facility-related factors, and vaccine-related factors. The tool was designed with open and closed-ended questions written in English, and it was pretested among five (5) caretakers of Lubaga Hospital. Pretesting was important to examine the accuracy and reliability of the questionnaires before actual data collection.

Data Collection Procedures.

Following completion of the proposal, approval was sought from the research committee of Lubaga Hospital to access the immunization clinic. At the immunization clinic, the researcher explained the aim and procedure of data collection to the respondents so that they consented to participate in the study. Using a researcher–administered approach, caretakers were asked questions written on the questionnaires as the respondents wrote down the responses they gave.

Data Management.

Safety and consistency of the questionnaire were ensured by examining the completeness of the questions, checking for mistakes, and correcting all the mistakes that were identified after every respondent. The questionnaires were kept in a lockable shelf with keys hidden by the researcher, and a password was used to protect electronic information.

Data Analysis.

The collected data was manually analyzed using paper, pens, and pencils, and then tallied. The results were then processed using Microsoft Word and Excel programs. These were processed and presented in the form of frequency tables, figures, pie charts, graphs, and narratives.

Ethical considerations.

Following the completion of the proposal, the research committee of Lubaga Hospital Training School offered an introductory letter. This was taken to the research committee of Lubaga Hospital, which granted permission to access the immunization clinic. At the immunization clinic, the researcher explained the aim and procedure of data collection to the respondents, which enabled them to consent to participate in the study. The following principles were implemented;

Privacy was ensured by involving a single respondent at a time in a private cubicle that was assigned by the person in charge.

Confidentiality and anonymity were ensured by not allowing respondents to write their particulars on the tools but rather by using serial numbers.

Autonomy was ensured by telling respondents that they were free to participate and withdraw at any stage in the study without any implication for their choice.

Results.

Table 1: Showing demographic characteristics of respondents

Variable	Category	Frequency (f)	Percentage (%)
Gender	Female	29	96.7
	Male	1	3.3
	Total	**30**	**100**
Age (years)	<30	25	83.3
	30–45	3	10
	45–60	2	6.7
	Total	**30**	**100**
Level of education	Primary	1	3.3
	Secondary	23	76.7
	Tertiary	4	13.3
	Never went to school	2	6.7
	Total	**30**	**100**
Occupation	Unemployed	6	20
	Salaried employment	18	60
	Non – salaried employment	4	13.3
	Business woman	2	6.7
	Total	**30**	**100**

Table 1 shows that; Almost all respondents, 29(96.7%), were female, while only 1(3.3%) was a male. Most of the respondents, 25(83.3%), were aged below 30 years, while the least, 2(6.7%), were aged 45 – 60 years. The majority of the respondents, 23(76.7%), had attained secondary education, while the minority, 1(3.3%), had attained primary education level. Most of the respondents, 18(60%), had salaried employment, while the least 2(6.7%) were businesswomen.

Caretaker-related factors affecting uptake of measles – rubella vaccination.

Figure 1: Awareness on recommended time of receiving the MR vaccine (n = 30).

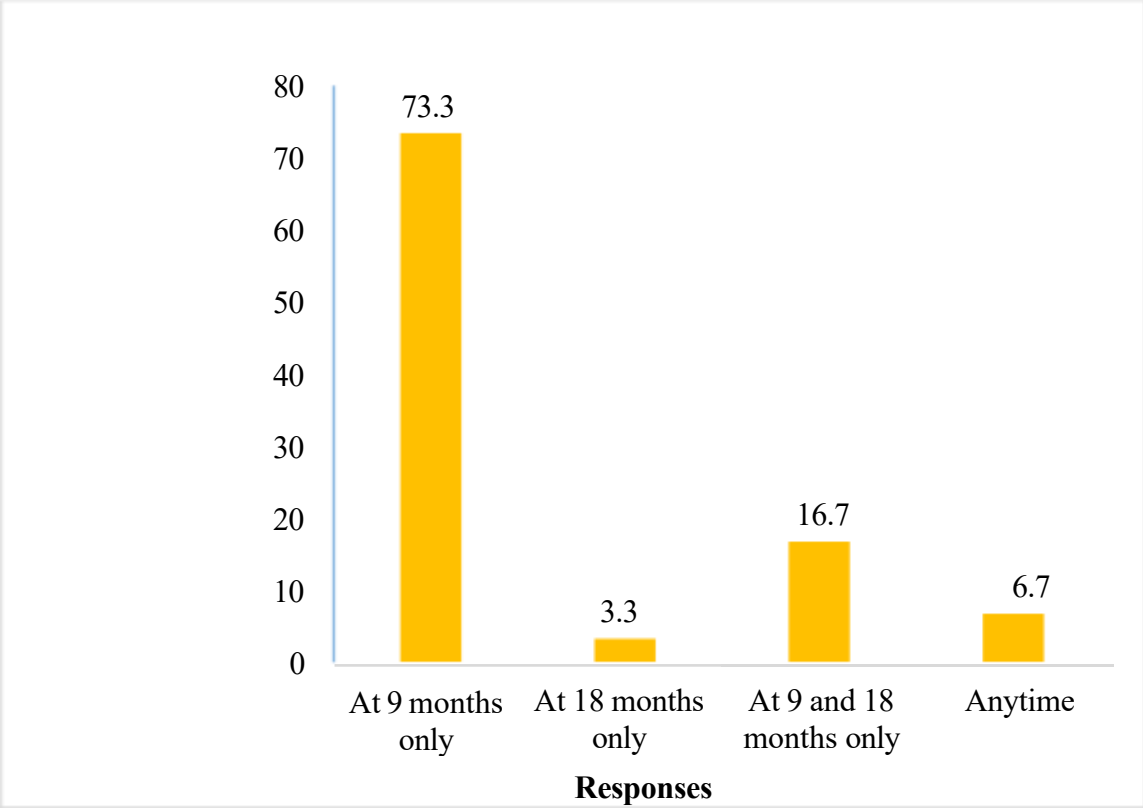

Figure 1 shows that the majority of the respondents, 22(73.3%), knew that the MR vaccine is offered at 9 months only, while a minority, 1(3.3%), mentioned at 18 months only.

Figure 2: Showing the number of antenatal care visits attended (n = 30).

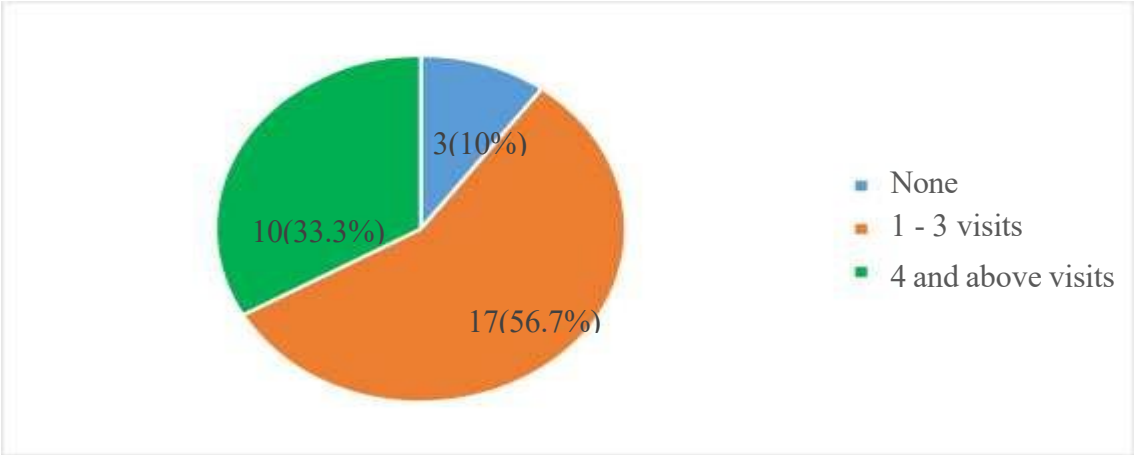

Figure 2 shows that most of the respondents, 17(56.7%), had attended 1 – 3 antenatal visits, while the least, 3(10%), had never attended antenatal care.

Table 2: Decision maker and denial of permission for childhood immunization (n = 30)

Variable	Category	Frequency (f)	Percentage (%)
Decision maker for seeking child health care services	My self	14	46.7
	Child's father	6	20
	Joint decision	10	33.3
	Total	**30**	**100**
Denial of permission to seek MR vaccines	Always	8	50
	Sometimes	5	31.2
	Never	3	18.8
	Total	**16**	**100**

Table 2 shows that nearly half of the respondents 14, 46.7%) would make a decision to seek MR vaccination by themselves, while the least 6(20%) was made by the child's father. Out of 16 who did not make the decision themselves, half 8(50%) were always denied permission to seek MR vaccines, while the remaining 3(18.8%) were never denied permission to seek MR vaccines.

Figure 3: showing forgetfulness of return dates for MR vaccines (n = 30)

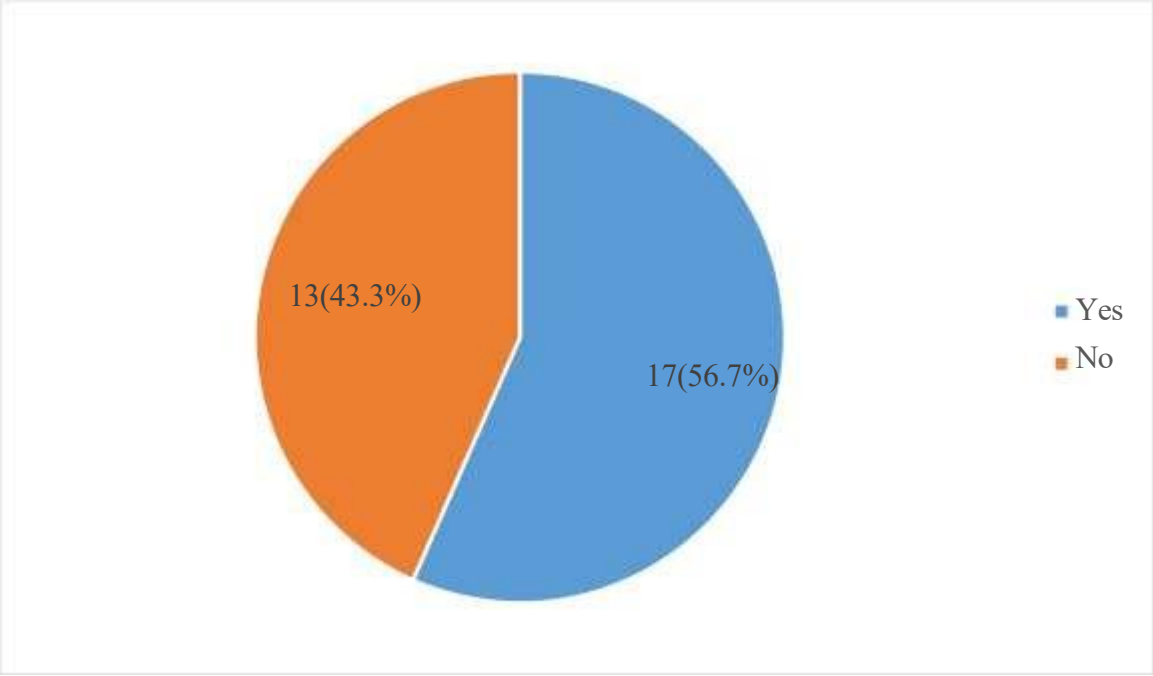

Figure 3 shows that most of the respondents, 17(56.7%), had forgotten the return date for MR vaccination, while the least 13(43.3%) did not forget the return dates for the MR vaccine.

Table 4: History of stock out of MR vaccine (n = 30)

Variable	Frequency (f)	Percentage (%)
Yes	0	0
No	30	100
Total	**30**	**100**

All respondents 30(100%), had never been told that MR vaccines were in stockout.

Table 5: Distance from home to the health facility (n = 30)

Variable	Frequency (f)	Percentage (%)
<5 kilometres	6	20
5 – 10 kilometres	21	70
>10 kilometres	3	10
Total	**30**	**100**

Table 5 shows that the majority of the respondents, 21(70%), were living within a distance of 5 –10 kilometres from a health facility, while a minority, 3(10%), lived at a distance of >10 kilometres from a health facility.

Figure 4: showing the opening days of the vaccination clinic (n = 30)

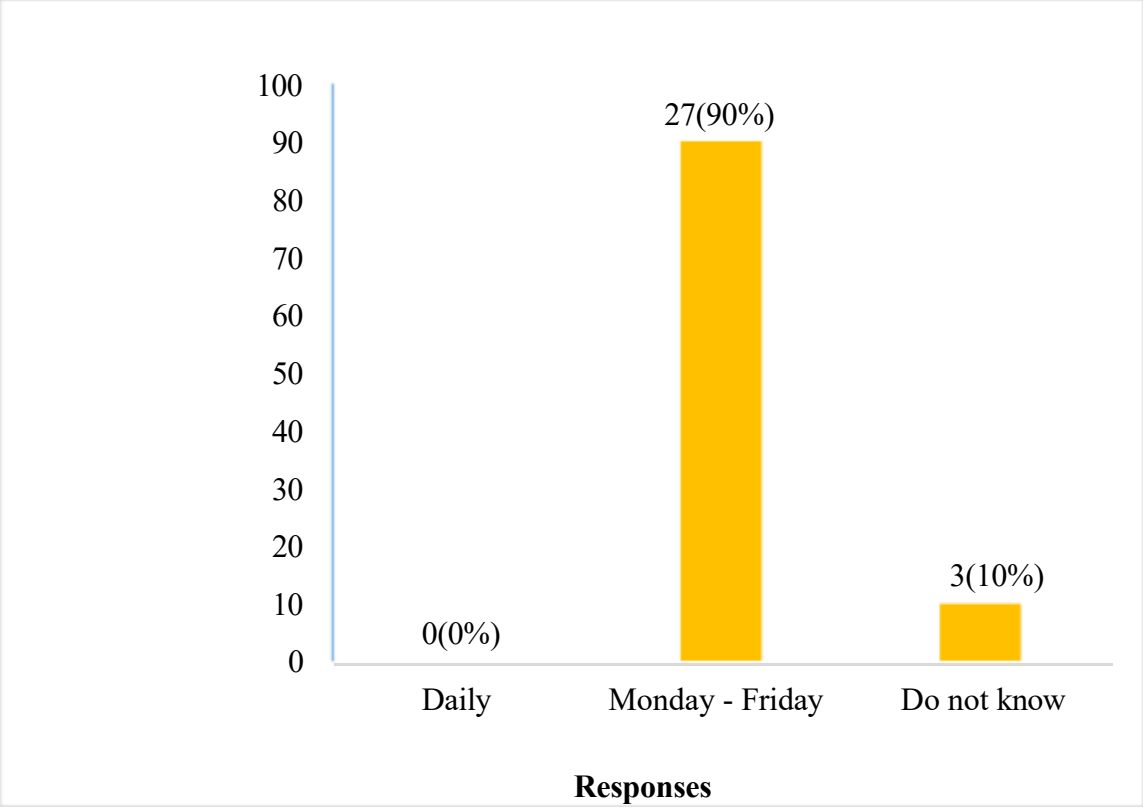

Figure 4 shows that the majority of the respondents, 27(90%), reported that the clinic was open from Monday to Friday, while a minority of 3(10%) did not know the days the immunization clinic is open.

Figure 5: showing whether the operating schedules of the immunization clinic are favorable (n = 30)

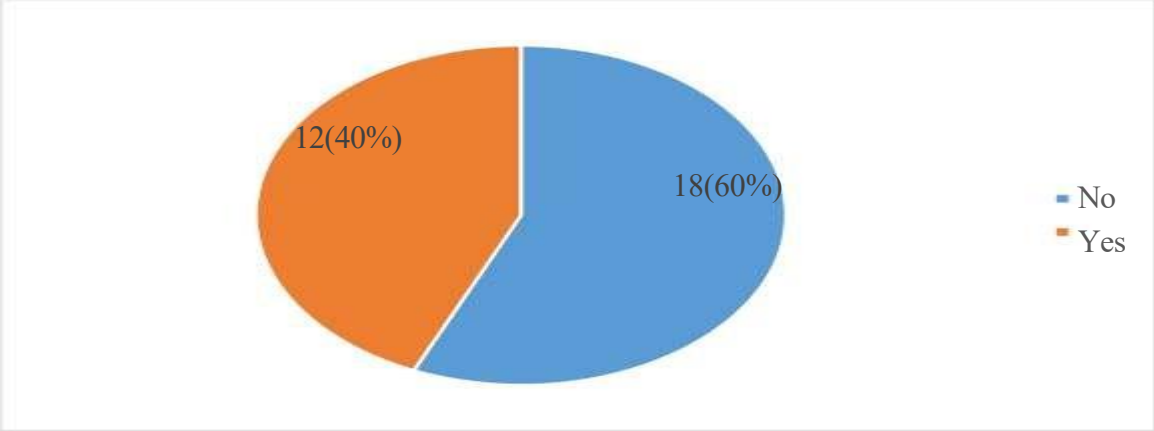

Figure 5 shows that most of the respondents, 18(60%), reported that operating schedules of the immunization clinic are not favorable, while the least, 12(40%), reported that operating schedules of the immunization clinic are favorable.

Table 6: Attitude of health workers at the immunization clinic (n = 30)

Variable	Frequency (f)	Percentage (%)
Abusive	0	0
Welcoming	19	63.3
Unbothered	8	26.7
Do not know	3	10
Total	**30**	**100**

Table 6 shows that the majority of the respondents, 19(63.3%), reported that health workers at the immunization clinic are welcoming, while a minority of 3(10%) did not know the attitude of health workers at the immunization clinic.

Figure 6: A pie chart showing whether caretakers were counselled about the return dates and benefits of MR vaccination (n = 30)

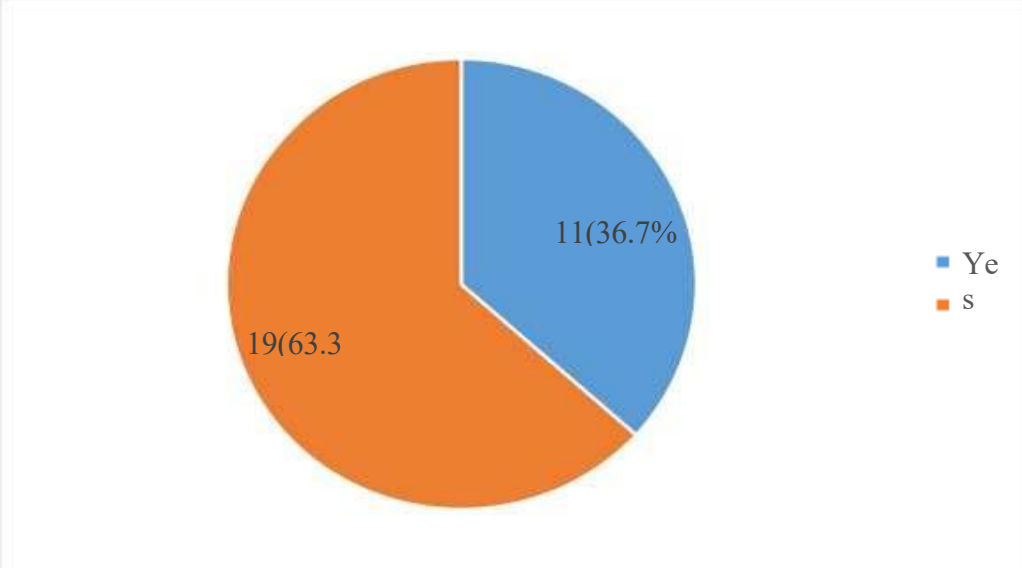

Figure 6 shows that most of the respondents, 19(63.3%), were not counselled about the return dates and benefits of MR vaccination, while the least 11(36.7%) were counselled about the return dates and benefits of MR vaccination.

Table 7: Waiting time before receiving immunization services (n = 30)

Variable	Frequency (f)	Percentage (%)
<30 minutes	6	20
30 minutes – 2 hours	23	76.7
>2 hours	1	3.3
Total	**30**	**100**

According to Table 7, the majority of the respondents, 23(76.7%), reported that the waiting time at the immunization

services was 30 minutes to 2 hours, while a minority of 1(3.3%) reported more than 2 hours.

Vaccine-related factors affecting uptake of measles – rubella vaccination.

Figure 7: A graph showing whether fear of side effects prevents caretakers from seeking MR for their children (n = 30)

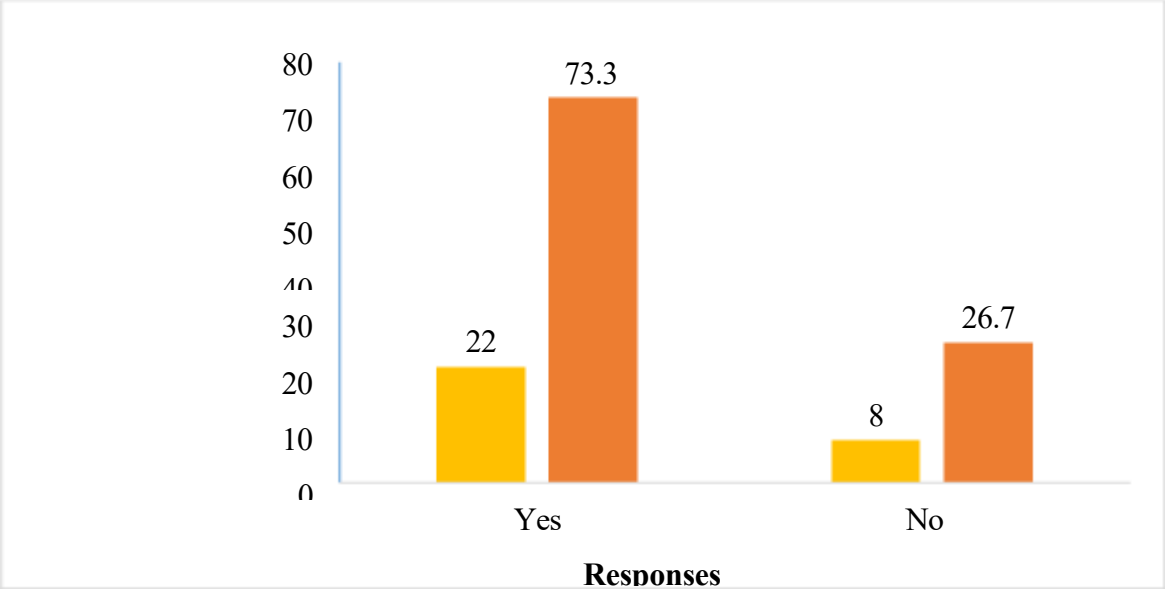

Figure 7 shows that the majority of respondents, 23(73.3%), reported that fear of side effects prevented them from seeking MR for their children, while a minority, 8(26.7%), reported that fear of side effects did not prevent them from seeking MR for their children.

Table 8: Whether the MR vaccine is effective (n = 30)

Variable	Frequency (f)	Percentage (%)
Agree	4	13.3
Not sure	6	20
Disagree	20	66.7
Total	**30**	**100**

Table 8 shows that two-thirds of the respondents 20(66.7%) disagreed that the MR vaccine is effective, while the least 4(13.3%) agreed that the MR vaccine is effective.

Table 9: Whether the number of times receiving the MR vaccine prevents caretakers from seeking the MR vaccine for their children (n = 30)

Variable	Frequency (f)	Percentage (%)
Agree	26	86.7
Not sure	0	0
Disagree	4	13.3
Total	**30**	**100**

Table 9 shows that the majority of the respondents, 26(86.7%), agreed that the number of times receiving the MR vaccine prevented caretakers from seeking the MR vaccine for their children, while a minority of 4(13.3%) disagreed.

Figure 8: A pie chart showing whether MR can harm the child (n = 30)

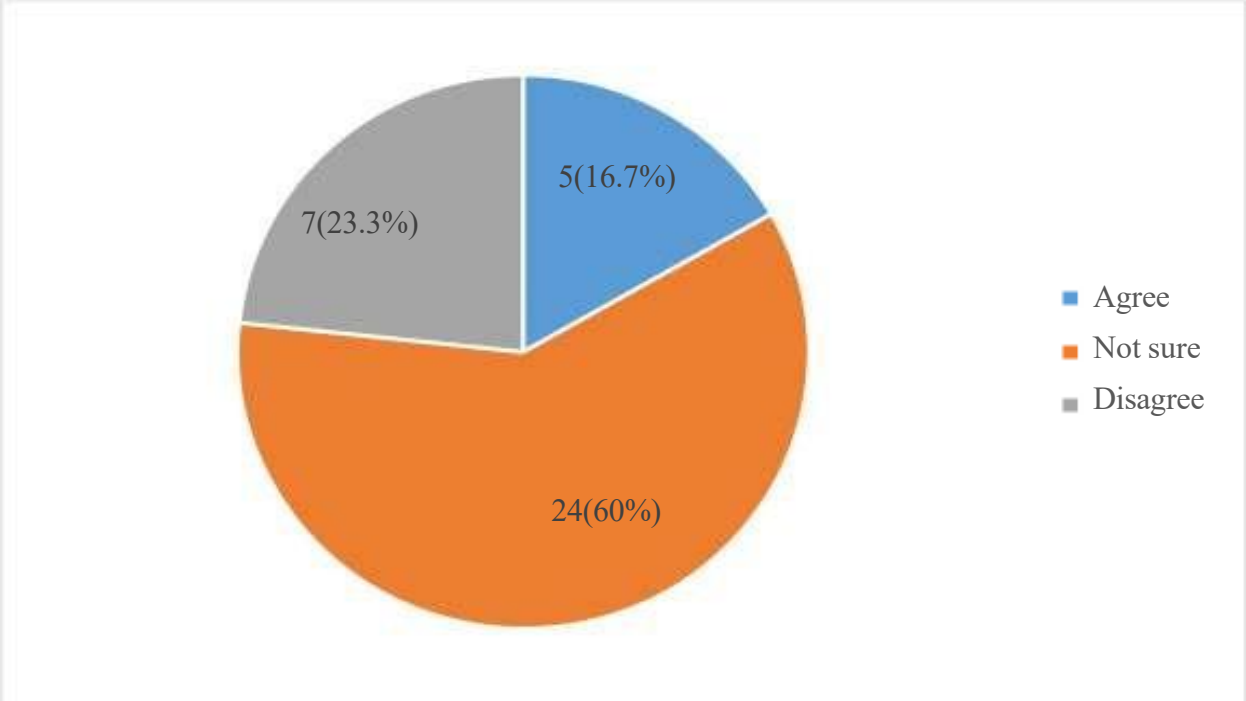

Figure 8 shows that most of the respondents, 24(60%), were not sure whether MR can harm the child, while the least, 5(16.7%), agreed that MR can harm the child.

Discussion.

Caretaker-related factors affecting uptake of measles – rubella vaccination.

Findings of the study showed that the majority of the respondents (73.3%) knew that the MR vaccine is offered at 9 months only. This is probably because caretakers still hold the previous information about the single-dose measles vaccine without updated information about the MR vaccine, which is a double-dose vaccine. This disagrees with a study by Kanyiru et al (2019) done in Kenya, which explored that high awareness about MR influenced the uptake. It was revealed that 90.3% of caregivers knew that the child should receive the MR vaccine at 9 and 18 months of age.

Furthermore, most of the respondents (56.7%) had attended 1 – 3 antenatal visits. This low attendance of antenatal care services puts mothers at risk of missing out on health education talks about the vaccination schedules, resulting in missed doses of the MR vaccination. On the contrary, a study by Demewoz et al

(2023) carried out in Northwest Ethiopia found that 75% of patients who had attended three or more antenatal care visits had sought the child's second MR doses, unlike those who did not attend antenatal care.

According to study results, half (50%) were always denied permission to seek MR vaccines. This is probably because of low male partner involvement in maternal and child health care services, leading to limited awareness about MR, leading to hesitance to all the partners to take their children for MR vaccination. Similarly, a study by Salleh et al (2023) carried out in Malaysia revealed that women were denied permission by their spouses to seek the vaccination services for their children; thus, they did not receive MR. The findings of the study revealed that most of the respondents (56.7%) had forgotten the return date for MR vaccination. This could be due to busy schedules that occupy their minds, leading to forgetfulness, thus skipping the MR vaccine. This is in agreement with a study by Dalaba et al (2023) carried out in Ghana, which found that 20.5% of caretakers had forgotten the return date for MR vaccines, hence missed vaccinating their children.

Health facility-related factors affecting uptake of measles – rubella vaccination.

All respondents (100%) reported that the MR vaccine was always available at the health facility. This is probably because of low uptake of the MR vaccine; many doses remain in stock. The constant availability of the MR vaccine would create confidence among caretakers that the vaccine is always available for them at the health facility. On the contrary, a study by Ahmed (2019) done in Ghana revealed that the shortage of the MR vaccine was associated with low uptake among 59.09% of children because the health workers had no MR vaccine to offer to the children on the return dates.

Study findings revealed that the majority of the respondents (70%) were living within a distance of 5 – 10 kilometres from a health facility. This could lead to high transport fares that they may be unwilling to incur, thus missing out on MR vaccination. This is supported by a study by Alemu et al (2024) done in East Africa, which revealed that long distances to the vaccination centers were hindering caretakers from seeking childhood MR vaccination.

Findings of the study showed that the majority of the respondents (90%) reported that the clinic was open from Monday to Friday, and most of the respondents (60%) reported that the operating schedules of the immunization clinic are not favorable since they were working. This is in agreement with a study by Salleh et al (2023) carried out in Malaysia, which found that irregular opening of the vaccination clinic was affecting the uptake of the MR vaccine for children.

According to study results, most of the respondents (63.3%) were not counselled about the return dates and benefits of MR vaccination. This is probably because caretakers reach the immunization clinic late when health education and counselling sessions have been completed, thus missing out on the health talks about the benefits of the MR vaccine. This exposes them to wrong information that leads to low uptake of the vaccine. This is in disagreement with a study by Taffie et al (2024) conducted in Ethiopia, which found that the provision of health education about the MR vaccine by health care workers (91.3%) was influencing the uptake of the vaccine.

The findings of the study revealed that the majority of the respondents (76.7%) reported that the waiting time at the immunization services was 30 minutes to 2 hours. This could be due to a heavy workload compared to the available staff to offer vaccination services, thus hindering the future uptake of the MR vaccine. This is in agreement with a study by Mkopi et al (2021) done in Tanzania, which explored that long waiting times at the immunization clinic affected the caretakers' intention to complete the child's MR vaccines. Furthermore, a study by Ogutu et al (2023) found that long waiting times exceeding one hour were contributing to low uptake of the MR vaccine for children.

Vaccine-related factors affecting uptake of measles – rubella vaccination.

Study findings revealed that the majority of respondents (73.3%) reported that fear of side effects prevents them from seeking MR for their children. This might be because caretakers do not wish their children to encounter the discomforting side effects caused by the vaccine, thus choosing to miss it to avoid the side effects. This is in line with a study by Ahmed (2019) carried out in Ghana, which revealed that 80.05% of parents would not seek childhood MR vaccination due to fear of side effects associated with MR vaccines, such as fevers.

Findings of the study showed that two-thirds of the respondents (66.7%) disagreed that the MR vaccine is effective. This was because caretakers had ever witnessed measles cases among children who were vaccinated against MR vaccine. This agrees with a study by Mensah and Gyasi (2022) done in Uganda, which found that caregivers had hidden their children from receiving the vaccine because they believed that it was not effective in preventing measles. Furthermore, the majority of the respondents (86.7%) agreed that the number of times receiving the MR vaccine prevents caretakers from seeking the MR vaccine for their children. This could be because the MR vaccine should

be given twice, which caretakers perceive as time-consuming to seek the complete MR vaccine doses. This agrees with a study by Adugna et al (2024) done in Ethiopia, which discovered that the number of doses of the MR vaccine children should receive was leading to non – uptake by their caregivers. In addition, a study by Salleh et al (2023) carried out in Malaysia found that caretakers complied with the double doses of MR required by the child to be many compared to ordinary measles vaccines, thus skipping the second MR doses.

According to study results, most of the respondents (60%) were not sure whether MR can harm the child. This is probably because they have never witnessed individuals claiming the MR vaccine harmed their children, thereby creating doubt among caretakers about the safety of the vaccine. This agrees with a study by Dalaba et al (2023) done in Ghana, which found that perceptions that the MR vaccine is harmful to children, hence affected MR vaccine uptake among children.

Conclusion

The low uptake of measles rubella vaccines is associated with caretaker, health facility-related, and vaccine-related factors.

Caretaker-related factors affecting uptake of MR vaccines were unaware of recommended times of receiving the MR vaccine, low antenatal attendance, denial of permission to seek vaccines, and forgetfulness.

Health facility-related factors affecting uptake of the MR vaccine were long distance to the hospital, unfavorable operating schedules of the clinic, absence of counselling sessions on MR vaccines, and long waiting times at the clinic.

Vaccine-related factors affecting uptake of the MR vaccine were fear of side effects, doubt in the effectiveness and safety of the vaccine, as well as the frequency of receiving the vaccine.

Recommendation.

The Ministry of Health should intensify the health education campaigns about the MR vaccine to increase awareness of the recommended number of doses, effectiveness, and safety of the vaccine.

Lubaga hospital should offer vaccination services from Monday to Sunday to render vaccination services convenient for them to seek the vaccines.

Health workers should offer regular counselling sessions to increase caretakers' awareness on MR vaccine and should offer a written and verbal return date to enable mothers to remember when they should seek the MR vaccines.

Caretakers are urged to attend antenatal care so as to gain the opportunity to learn about MR vaccines.

Scholars are encouraged to use the study results to conduct related studies on the topic.

Acknowledgment.

Firstly, I thank the almighty God for giving me the opportunity and wisdom to pursue this study and academic level.

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Special appreciation is extended to the management of Lubaga Hospital and study participants for their positive reception and cooperation during my course of study.

Abbreviations and Acronyms.

HIV: Human Acquired Immune Deficiency Virus
MoH: Ministry of Health
MR: Measles – Rubella
UNICEF: United Nations Children Fund
WHO: World Health Organisation.

Source of funding.

The study was not funded.

Conflict of interest.

There is no conflict of interest.

Availability of data.

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

Authors contribution.

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

Author's biography.

Christine Namayanja is a student of a diploma in Nursing at St. Michael Lubaga Hospital Training Schools.

Magdalene Babirye is a research supervisor at St. Michael Lubaga Hospital Training Schools.

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