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LARGE SCALE YELLOW FEVER VACCINATION: PARTICIPATORY RATE AMONG HEALTH PROFESSIONAL TRAINEES AT MILDMAY INSTITUTE OF HEALTH SCIENCES, WAKISO DISTRICT. A CROSS-SECTIONAL STUDY.

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Abstract

Background

Yellow fever remains a major public health issue in Uganda and other tropical regions. Health professions trainees are critical in preventing and controlling yellow fever outbreaks, but their vaccination status and knowledge about the disease were not well-documented. The study aimed to determine the prevalence of yellow fever vaccination and the knowledge of health professional trainees regarding yellow fever and its vaccination.

Methodology

A cross-sectional study was conducted among 40 health professional trainees at Mildmay Institute of Health Sciences. Data was collected using a structured questionnaire. Data was analyzed using descriptive statistics and cross-tabulation of the key characteristics using an Excel spreadsheet. Results were presented in tables, charts, and graphs to represent key findings and illustrate distributions, respectively.

Results

The results from the data collection showed yellow fever vaccination prevalence was 72.5% being vaccinated and 27.5% being unvaccinated, with males (91.7%) showing higher coverage than females (64.3%). Trainees aged 31-35 had 100% vaccination coverage, compared to 69.7% among those aged 18-25. Socio-economic status also influenced vaccination rates, with trainees from high-income backgrounds (83.3%) more likely to be vaccinated than those from middle (69.0%). Knowledge about yellow fever transmission, symptoms, and vaccination benefits was high among most respondents.

Conclusion

Although vaccination rates were generally strong, younger trainees and females showed lower coverage.

Recommendation

There should be targeted vaccination initiatives for these groups and integration of vaccination services with educational programs within training institutions.

Keywords. *Yellow Fever Vaccination, Health Professional Trainees, Mildmay Institute, Wakiso District.*
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Background of the study

Large-scale yellow fever vaccination refers to massive immunization campaigns aimed at controlling and preventing yellow fever outbreaks (WHO, 2022). Yellow fever is a viral disease transmitted by mosquitoes, and the best prevention method is vaccination (WHO, 2022). These campaigns are particularly critical in regions where yellow fever is endemic, such as parts of Africa and South America, as there are essential public health interventions designed to achieve high coverage rates, establish herd immunity, and prevent outbreaks (WHO, 2022). The success of these campaigns depended significantly on the willingness and ability of the target population to participate, influenced by factors such as knowledge, attitudes, and beliefs about yellow fever and logistical aspects of vaccine delivery (WHO, 2022).

For nursing students, participation in large-scale yellow fever vaccination campaigns was vital not only for their protection but also as an educational opportunity. Health professional trainees are often at the forefront of healthcare delivery, and their involvement in vaccination efforts can enhance their understanding of public health practices and the importance of vaccinations (UNICEF, 2022). Engaging health professional trainees in such campaigns can also influence the broader community's perception of the vaccine, potentially increasing overall vaccination rates (UNICEF, 2022). However, the prevalence of yellow fever vaccination coverage among health

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professional trainees globally are not well-documented, and available data suggests that uptake is generally low (WHO, 2020).

In Africa, where yellow fever is endemic, studies show varying rates of vaccination coverage among healthcare workers, including nursing students (WHO, 2022). For instance, in Nigeria, only about 48% of health professional trainees were vaccinated (Adeyemo et al., 2019). Similarly, in Ghana, the rate was 52% (Boateng et al., 2020). In East Africa, Kenya reported a 60% vaccination rate among health professional trainees (Mwangi et al., 2021), and Tanzania had 55% coverage (Kilonzo et al., 2018). Despite these figures being higher than in some other African countries, they still fall short of the desired levels for adequate protection and herd immunity (WHO, 2022). In Uganda, less than 10% of the population has been immunized against yellow fever, indicating a significant gap in population immunity (MOH, 2019).

The low turn-up for large-scale yellow fever vaccination among health professional trainees poses significant public health challenges by reducing herd immunity and increasing the risk of outbreaks within healthcare settings and the broader community (WHO, 2022). Given this context, the researcher aimed to determine the prevalence of large-scale yellow fever vaccination and turnout among health professional trainees at the Mildmay Institute of Health Sciences in Wakiso District.

Methodology

Study Design

The study employed a cross-sectional design using quantitative research methods. Data was collected from respondents via questionnaires, which are effective for gathering structured information. This design enabled the collection of all necessary data at a single point in time, ensuring that the study could be completed within the limited time frame available.

Study Setting

The study was conducted at the Mildmay Institute of Health Sciences, located approximately 15 kilometers from Kampala, Uganda's capital city. This institute is a prominent educational center offering various health sciences programs, including Nursing, Clinical Medicine, Medical Laboratory Sciences, Nutrition, and Public Health. The School of Nursing enrolls around 200 students, the School of Clinical Laboratory Sciences about 150, and the School of Public Health and Nutrition accommodates approximately 150 students. These programs are designed to provide students with comprehensive theoretical and practical training essential for their professional development. The institute's active involvement in public health initiatives, such as yellow fever vaccination campaigns, made it an ideal setting for this study. The environment allowed for a thorough assessment of the knowledge and participation rates in yellow fever vaccination among health professional trainees, ensuring the availability of relevant data to meet the study's objectives.

Study Population and Rationale

The study population included all health professions trainees at the Mildmay Institute of Health Sciences in Wakiso District who were eligible for the large-scale yellow fever vaccination during the data collection period. The vaccination campaign was scheduled to take place over two weeks, with an expected participation of approximately 50 students per day. This population was selected to evaluate vaccination uptake among future healthcare providers, offering insights into the factors that influence their participation in public health initiatives.

Sample Size Determination

The Burton formula (1965) formula was used, that is

Where;

$$N = \frac{QR}{O}$$

Q: is the total number of days taken to collect data.

R: Is the maximum number of respondents to be interviewed O: Maximum amount of time on each respondent.

Q= 8, R= 5, O = 1 hour

Therefore,

$$N = \frac{8\ X\ 5}{1} = 40$$

N= 40 respondents

A sample size of 40 respondents was used.

Sampling Procedure

A stratified random sampling technique was employed to select participants from various health training programs at the Mildmay Institute of Health Sciences. Eligible participants included students from the Schools of Nursing, Clinical, Laboratory Sciences, and Nutrition. The student population was first divided into strata based on department and cohort, followed by random selection within each cohort to ensure representation across all study levels. Stratification considered key demographics such as sex, age, and nationality to capture a diverse sample.

On vaccination days, 80 folded papers (40 marked "YES" and 40 marked "NO") were placed in a box. Eligible students were each asked to draw a paper, with those drawing "YES" participating in the study, while those drawing "NO" did not. This process continued until the required sample size was achieved. A list of selected participants was updated accordingly. Students who were

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unavailable due to illness or offsite at the time of data collection were excluded.

Inclusion Criteria

The study included health professional trainees at the Mildmay Institute of Health Sciences in Wakiso District who met the following criteria:
Currently enrolled in programs such as Nursing, Midwifery, Clinical Medicine, Medical Laboratory, and Public Health.
Eligible for yellow fever vaccination as per WHO guidelines. Voluntarily consented to participate in the study.

Exclusion Criteria

Students already enrolled in the study but were unable to participate due to illness at the time of data collection.
Students who were offsite or otherwise unavailable during the data collection period.

Definition of Variables Dependent Variable:

Participation Rates in Yellow Fever Vaccination: This primary outcome variable was measured by assessing the number of health professions trainees who had received the yellow fever vaccine, verified through institutional vaccination records or self-reported data.

Independent Variables:

Demographic Characteristics: Factors such as age, gender, year of study, and course were assessed using self-report or institutional data.
Knowledge and Awareness of Yellow Fever: Assessed through a questionnaire evaluating participants' knowledge of yellow fever causes, symptoms, transmission, and awareness of the vaccination program and reasons for participating.

Research Instruments

Data collection was carried out using a structured questionnaire developed by the researcher, which consisted of closed-ended questions to ensure uniformity in responses and ease of analysis. The questionnaire was designed in English and aligned with the study objectives, guided by a literature review. To ensure its reliability and validity, the questionnaire was pre-tested on 10 health professions trainees. This pre-test helped identify unclear wording or question misinterpretation. Necessary adjustments were made before final use in the main study. A researcher-developed data collection tool was pre-tested with a small group of non-participating
students to ensure its reliability and validity. This pre-test allowed for identifying and resolving potential issues before the main study.

Data Collection Procedure

Data was collected over four consecutive days, recruiting 10 respondents per day. A letter of introduction was obtained from the Mildmay Institute of Health Sciences. All data was collected by the researcher to ensure consistency. The data collection process included explaining the study's purpose and obtaining written informed consent. Confidentiality and privacy are ensured throughout the interview process. Self-administered questionnaires were distributed to participants who could read and write in English. Respondents selected the most appropriate answers by ticking boxes. The questionnaires were immediately reviewed for completeness, and incomplete ones were returned to participants for completion. For participants who could not read or write, the researcher read out the questions, translated them into the local language if necessary, and recorded their responses.

Data Management

The filled questionnaires were checked at the end of each day for omissions and inconsistencies. Data management included double-checking all the questionnaires for completion before losing contact with the trainees. The data collected was entered into an Excel spreadsheet, edited, coded, and cleaned before analysis. Files that contained the respondents' identity and written informed consent were secured with a security code and in a lockable cupboard or drawer respectively.

Data Analysis and Presentation

Data was analyzed by descriptive statistics using an Excel spreadsheet, and cross-tabulation of the key characteristics with the outcome variable (prevalence of yellow fever vaccination) to explore
associations was conducted. Presentation of analysis of results in tables, charts, and graphs to visually represent key findings and illustrate distributions respectively was done.

Ethical Considerations

The study was conducted following the principles of informed consent and confidentiality.
The study's purpose and objectives were explained to all parties involved. Written informed consent was signed by each respondent before data collection. The respondent's decisions were honored and no names were captured on the questionnaire instead numbers were assigned to each respondent. Participants were assured that their participation was voluntary, and they may withdraw at any time as they wished.

Informed consent

All the study participants consented to this study.

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Results

Descriptive characteristics of the respondents

A descriptive analysis of key demographic characteristics was conducted. Results were manually tallied and entered into an Excel spreadsheet for analysis. Then all variables were summarized in a descriptive table using frequencies and percentages.

Table 1 shows the distribution of Respondents key Characteristics (n = 40)

Respondent characteristics	Frequency (n)	Percentage (%)
Age group		
18-25 years	33	82.5
26-30 years	5	12.5
31-35 years	2	5
Gender		
Male	12	30
Female	28	70
Nationality		
Ugandan	39	97.5
Non-Ugandan	1	2.5
Department/school		
School of Medical Laboratory	11	27.5
School of Nursing	12	30
Clinical Medicine School	8	20
Applied School	9	22.5
Current year of study		
First Year	9	22.5
Second Year	11	27.5
Third Year	20	50
Employment status in addition to studies		
Yes, full-time	2	5
Yes, part-time	10	25
No	28	70
Socioeconomic status		
Low	5	12.5
Middle	29	72.5
High	6	15

N = 40, primary data (2024).

The study involved a sample of 40 participants (n = 40) as shown in Table 1, predominantly aged 18-25 years (82.5%), 26- 30 years (12.5%) and 31-35 years (5%). The majority of respondents were female (70%). The overwhelming majority of participants were Ugandan nationals (97.5%), with only one participant (2.5%) reporting a different nationality. Regarding the academic background of the participants, most respondents were enrolled in the School of Allied Health Sciences (52.5%), followed closely by the School of Nursing (30%). Half of the participants were in the third year of study (50%), the majority (70%) of participants reported not being employed while studying and 72.5% of the participants classified their family's socioeconomic status predominantly as middle class.

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Prevalence of yellow fever vaccination by trainee demographic characteristics

Table 2 Prevalence of yellow fever vaccination

Demographic Characteristics	e of Yellow Fever Vaccination		
	Yes n (%)	No n (%)	Total n (%)
Prevalence of yellow fever vaccination	29(72.5)	11(27.5)	40(100)
Age group			
18-25 years	23(69.7)	10(30.3)	33(82.5)
26-30 years	4(80.0)	1(20.0)	5(12.5)
31-35 years	2(100.0)	0	2(5)
Gender			
Male	11(91.7)	1(8.3)	12(30)
Female	18(64.3)	10(35.7)	28(70)
Nationality			
Ugandan	28(71.8)	11(28.2)	39(97.5)
Non-Ugandan	1(100.0)	0	1(2.5)
Department/school			
School of Medical Laboratory	6(54.5)	5(45.5)	11(27.5)
School of Nursing	10(83.3)	2(16.7)	12(30)
Clinical Medicine School	8(100.0)	0	8(20)
Applied School	5(55.6)	4(44.4)	9(22.5)
Current year of study			
First Year	6(66.7)	3(33.3)	9(22.5)
Second Year	8(72.7)	3(27.3)	11(27.5)
Third Year	15(75.0)	5(25.0)	20(50)
Employment status in addition to studies			
Yes, full-time	1(50.0)	1(50.0)	2(5)
Yes, part-time	7(70.0)	3(30.0)	10(25)
No	21(75.0)	7(25.0)	28(70)
Socioeconomic status			
Low	4(80.0)	1(20.0)	5(12.5)
Middle	20(69.0)	9(31.0)	29(72.5)
High	5(83.3)	1(16.7)	6(15.O)

N = 40, primary data (2024).

Table 2 indicates the prevalence of yellow fever vaccination among health professional trainees, a significant 72.5% of participants reported having received the yellow fever vaccine and 27.5% had not received the yellow fever vaccine. The prevalence of yellow fever vaccination among trainees at the Mildmay Institute of Health Sciences varied across different demographic characteristics. Among the age groups, the highest vaccination rate was among 31-35 years (100%- 2/2) followed by 26-30 years (80%, 4/5), 18-25 years (69.7%, 23/33) vaccinated.

Male trainees demonstrated a notably higher vaccination prevalence, with 91.7% (11 out of 12) having received the yellow fever vaccine, compared to 64.3% (18 out of 28) of female trainees. Conversely, a smaller proportion of male trainees (8.3%) were unvaccinated, in contrast to 35.7% of female trainees who had not received the vaccine.

In terms of nationality, Ugandan respondents showed a 71.8% vaccination rate (28 out of 39), while the only non-Ugandan respondent was fully vaccinated (100%).

Vaccination prevalence also varied by department, out of 29(72.5) trainees vaccinated, trainees sampled from the Clinical Medicine School had the highest vaccination rate at 100% (8 out of 8), followed by the School of Nursing at 83.3% (10 out of 12). Conversely, the School of Medical Laboratory had a lower vaccination rate of 54.5% (6 out of 11), and the Applied School showed a similar pattern with 55.6% (5 out of 9) vaccinated.

In terms of the year of study, third-year students had a vaccination prevalence of 75% (15 out of 20), followed by

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second-year students with 72.7% (8 out of 11) and first-year students with 66.7% (6 out of 9). Additionally, employment status appeared to influence vaccination rates with those who are not employed showing a vaccination prevalence of 75% (21 out of 28), while part-time employed trainees had a vaccination rate of 70% (7 out of 10), and among the full-time employed, the vaccination rate is only 50% (1 out of 2).

Finally, family socioeconomic status also correlated with vaccination prevalence. Trainees from high-income families showed the highest vaccination rate at 83.3% (5 out of 6), followed by those from low-income families at 80% (4 out of 5). Trainees from middle-income families have the lowest vaccination rate at 69% (20 out of 29).

Previous yellow fever vaccination

Figure 1 shows Trainees' Previous yellow fever vaccination reports.

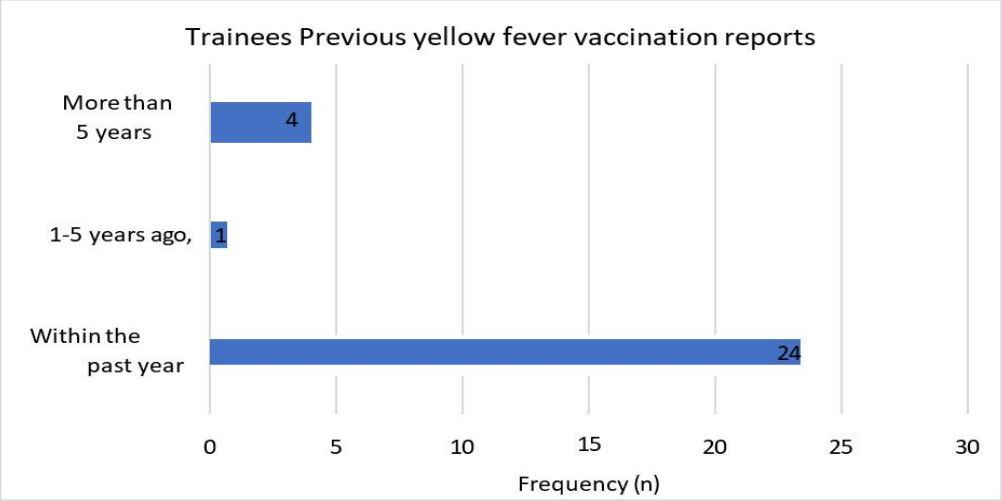
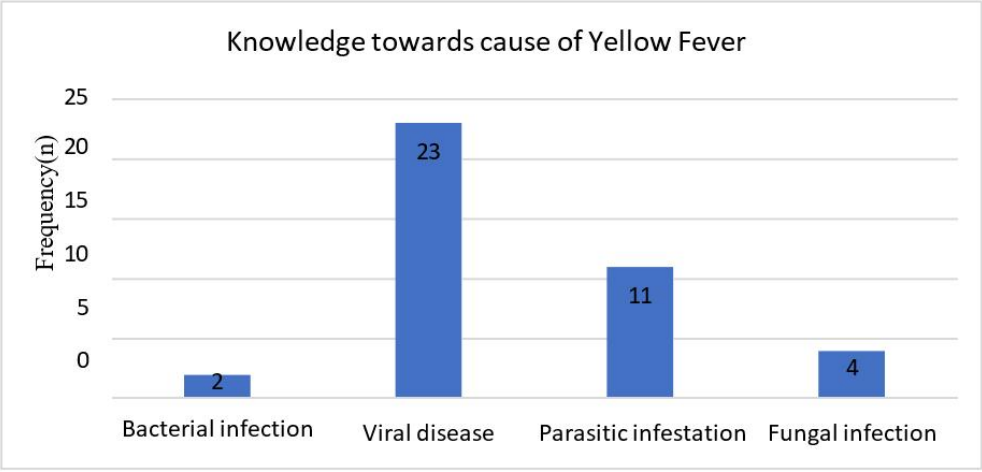


Figure 1 shows that among 29(72.5%) trainees who reported to have been vaccinated, 24(60%) had received their last vaccine within the past year, while only 1(2.5%) received it 1-5 years ago, and 4(10%) reported it had been more than five years since their last vaccination

.

Knowledge of health professional trainees towards yellow fever and vaccination.

Figure 2 Knowledge of the cause of Yellow Fever



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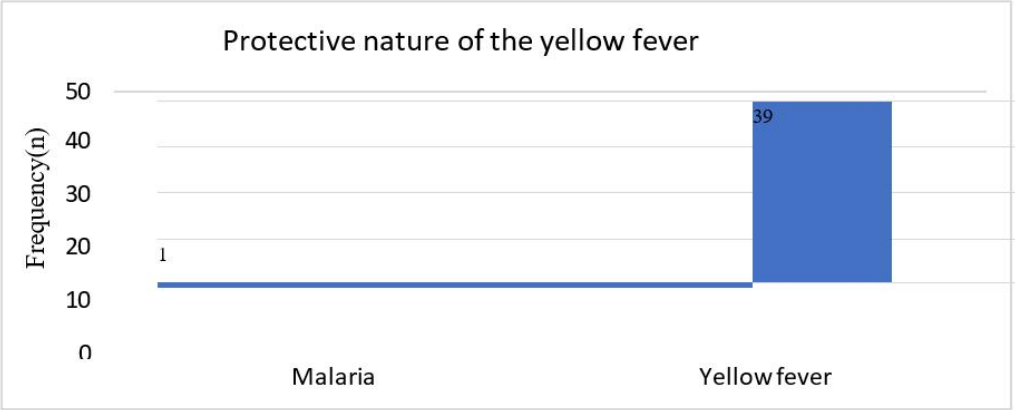
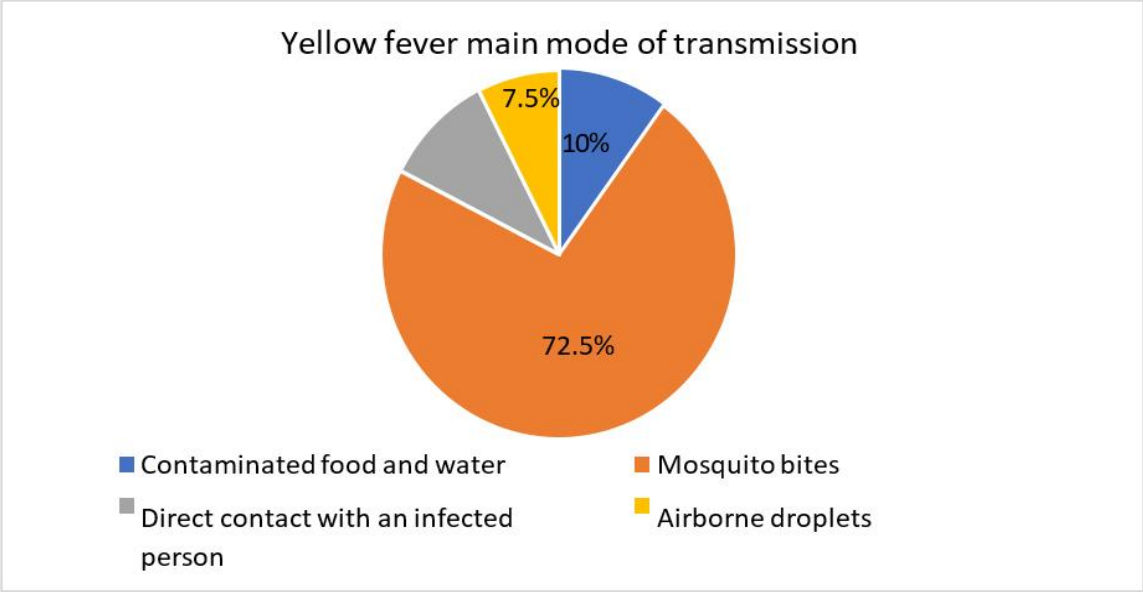
Knowledge regarding yellow fever varied among participants as shown in figure 2. A majority (57.5%) correctly identified yellow fever as a viral disease, whereas a significant number, 11(27.5%) incorrectly classified it as a parasitic infestation, 4(10%) as a fungal infection, and 2(5%) as bacterial infection.

Figure 3 Protective nature of the yellow fever vaccine.



Regarding the knowledge of trainees about the protective nature of the yellow fever vaccine as seen in Figure 3, an impressive 97.5% of participants understood that it primarily protects against yellow fever.

Figure 4: Knowledge of Yellow fever's main mode of transmission



When asked about knowledge of transmission of yellow fever, 72.5% correctly identified mosquito bites as the main mode of transmission, while misconceptions existed regarding contaminated food and water (10%) direct contact (10%), and being airborne (7.5%) as shown in figure 4.

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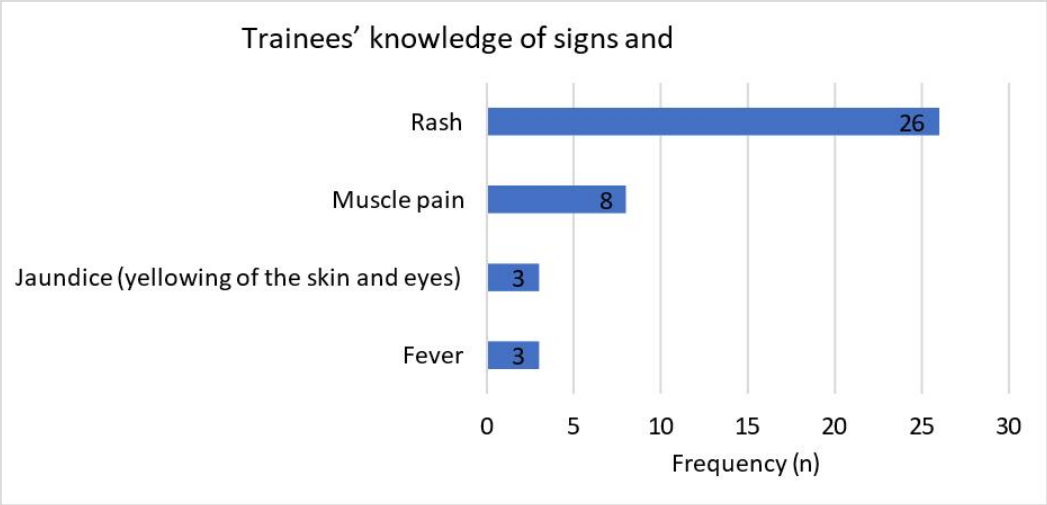
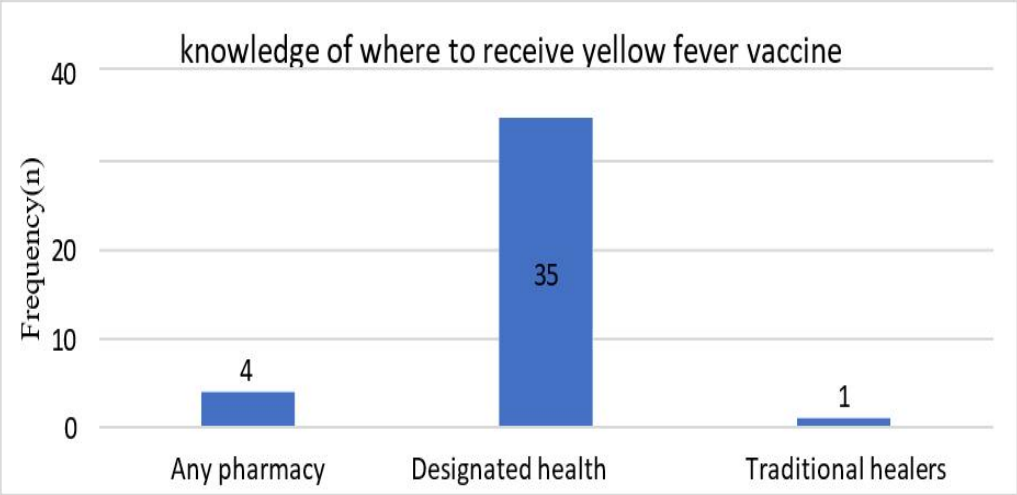
Figure 5: Trainee's knowledge of signs and symptoms



In terms of knowledge of signs and symptoms, figure 5 indicates that 65% of respondents recognized that a rash is not a common sign of yellow fever, while fever (7.5%) and jaundice (7.5%) were also correctly identified as common signs and symptoms.

Figure 6: knowledge of where to receive yellow fever vaccine.



The trainees preferred locations for receiving the yellow fever vaccine were designated health centers (87.5%), with only 10% indicating pharmacies as a vaccination site as shown in figure 6.

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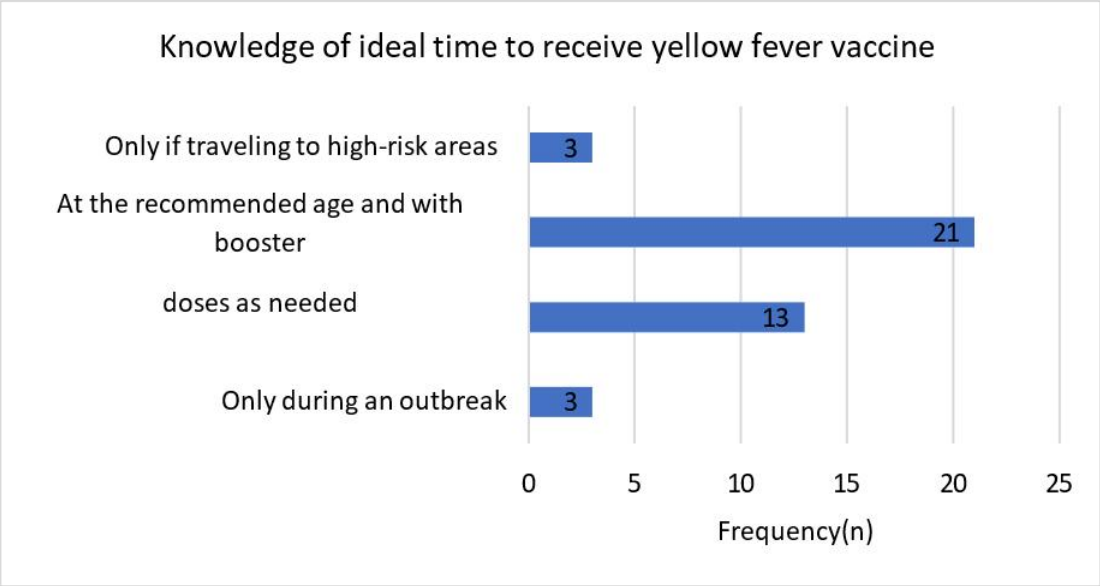
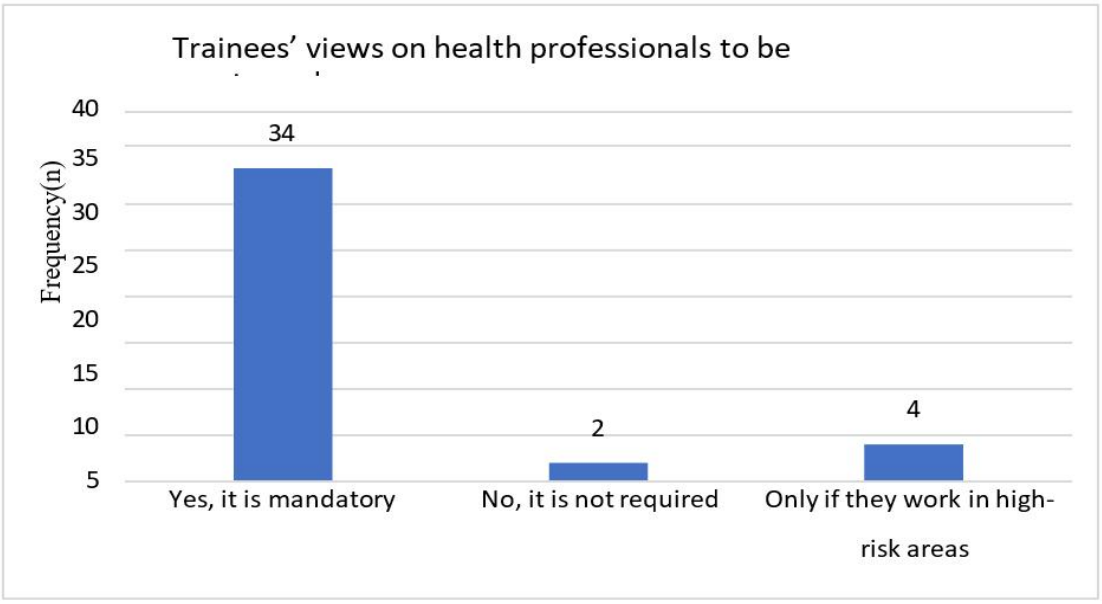
Figure 7: Knowledge of the ideal time to receive the yellow fever vaccine



Participants expressed varied opinions on the ideal time to receive the yellow fever vaccine as illustrated in Figure 7, with 52.5% indicating the importance of vaccination at the recommended age and with booster doses as needed.

Figure 8: Trainees' views on the requirement for health professionals to be vaccinated



A significant majority (34, 85%) recognized that health professionals are required to be vaccinated against yellow fever.

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Figure 9: Trainees' views on the Potential impacts of a yellow fever outbreak

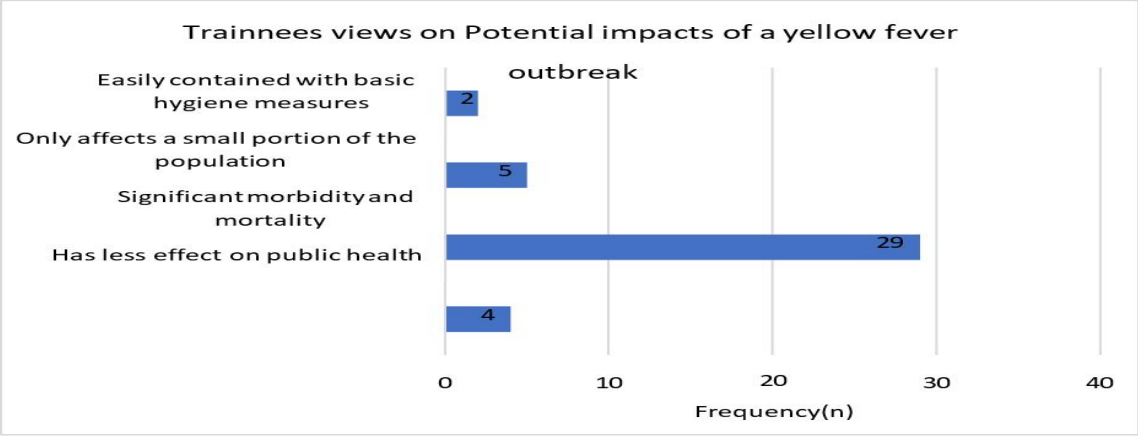
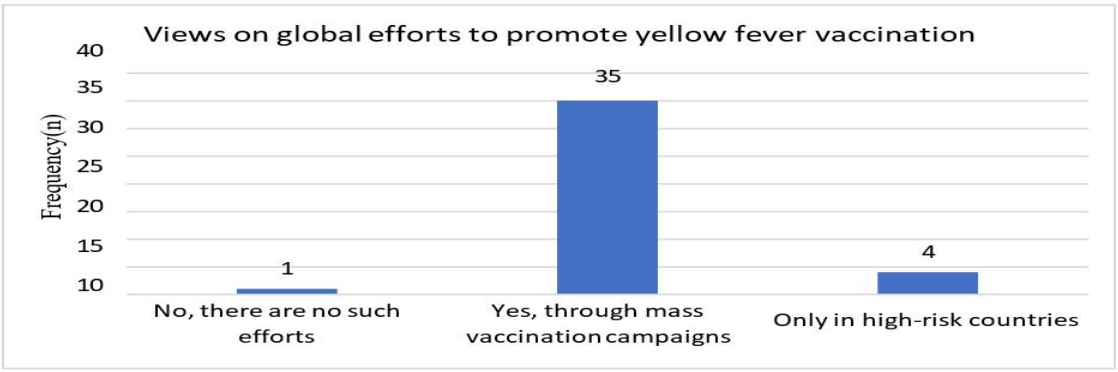


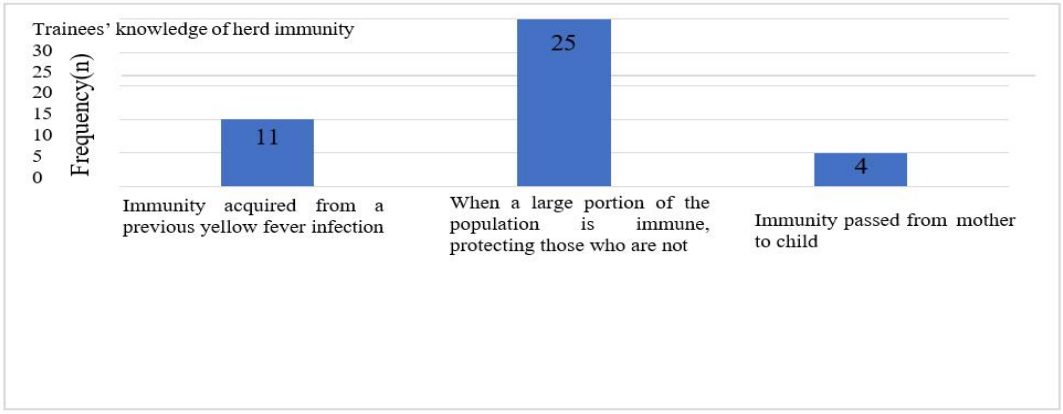
Figure 9 shows trainees had varied arguments on the potential impacts of a yellow fever outbreak, the majority (72.5%) of respondents acknowledged that a yellow fever outbreak could lead to significant morbidity and mortality.

Figure 10: Views on global efforts to promote yellow fever vaccination



In regards to awareness about global efforts, figure 10 showed that a robust majority (87.5%) reported awareness of global or regional efforts to promote yellow fever vaccination, primarily through mass vaccination campaigns.

Figure 11: Trainees' knowledge of herd immunity



Trainees' views on herd immunity presented in Figure 11, 62.5% of participants correctly defined it as the immunity acquired when a large portion of the population is immune, thus protecting those who are not.

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Discussion

Characteristics of respondents

From the data provided, the majority of the respondents (82.5%) were aged between 18-25 years, and the rest were in the 26-35-year range. This corresponded with the typical age range of health professions trainees in many training institutions. Similar age distribution trends were observed in studies like Mwangi et al. (2020) in Nairobi, where a significant portion (78%) of students fell within the 18-25 age group. The youthful demographic was likely due to the typical entry age into higher education for health training.

In terms of gender distribution, females represented a larger portion (70%) compared to males (30%), which aligned with trends in many health profession programs, where female enrolment often exceeds that of males, as noted in studies like Kabir et al. (2020) in Kampala.

The majority of the respondents were Ugandan nationals (97.5%), highlighting the localized nature of the sample group. This was consistent with other studies conducted within national borders, such as in Abuja by Olatunji et al. (2021), where local students predominated in the study sample. The distribution of students across departments showed that a significant proportion were from the School of Allied Health Sciences (52.5%) and the School of Nursing (30%). This indicated that a substantial number of students in these areas may be more exposed to infectious diseases, such as

yellow fever, due to their clinical rotations and direct patient care responsibilities, similar to findings by Li et al. (2020) in Beijing, where nursing students were found to be at higher risk of exposure due to their patient contact.

Regarding socioeconomic status, the majority of the participants (72.5%) classified themselves as being from middle-income families, with a smaller percentage from high (15%) and low (12.5%) socioeconomic backgrounds. This distribution was important, as socioeconomic status often affects access to healthcare services, including vaccinations. Studies like Johnson et al. (2021) in New York found that students from lower socioeconomic backgrounds were less likely to access vaccinations.

Prevalence of Yellow Fever Vaccination among health professional trainees

The prevalence of yellow fever vaccination among the respondents was 72.5%, with 60% having received their vaccination within the past year. This is slightly higher than the findings from Agaba et al. (2021), which reported a 72% vaccination rate among health professions trainees in Lagos, Nigeria. The relatively high rate observed in this study can be attributed to the convenience of accessing vaccines within the institution or through public health campaigns. Kabir et al. (2020) similarly found that higher vaccination rates were observed when services were provided at training institutions.

Among those vaccinated, the majority had been vaccinated recently, which is likely due to recent public health campaigns promoting yellow fever vaccination. Only a small fraction (27.5%) had never received the vaccine, showing a gap that needs to be addressed through targeted interventions, especially among students who may not perceive themselves at risk.

The fact that 87.5% of students acknowledged receiving their yellow fever vaccination from designated health centers, rather than pharmacies or traditional healers, underscores the importance

of regulated vaccination services. This was similarly emphasized in a study by Ndung'u et al. (2019), where the accessibility of designated centers was crucial in ensuring compliance with vaccination recommendations.

The vaccination rate among trainees in different age groups showed that older trainees, particularly those aged 31-35, had a higher vaccination rate (100%) compared to younger trainees. This was consistent with the study by Mwangi et al. (2020), which found that older students, particularly those over 25 years, tend to have higher vaccination rates, likely due to increased health awareness. Similarly, the lower vaccination rate of 69.7% among trainees aged 18-25 aligned with findings that younger individuals often have less health awareness and may prioritize vaccination less than their older counterparts.

Gender differences in vaccination rates were notable, with males having a significantly higher rate of 91.7% compared to females at 64.3%. This finding contrasted with some literature, such as the study by Agaba et al. (2021), which did not report significant gender differences in vaccination uptake. However, it may reflect specific social or cultural dynamics at the Mildmay Institute that influence health-seeking behaviors, including vaccination.

Nationality also played a role in vaccination rates, where Ugandan trainees showed a vaccination rate of 71.8%, while the only non-Ugandan participant was fully vaccinated. This aligned with findings by Kabir et al. (2020), who reported higher vaccination rates when services were integrated within institutions, as seen in Uganda, where mass vaccination campaigns and localized services had bolstered vaccination rates.

In terms of the academic department, trainees from the Clinical Medicine School had the highest vaccination rate (100%), followed by the School of Nursing (83.3%), while lower rates were observed in the School of Medical Laboratory (54.5%) and Applied School (55.6%). This pattern

was consistent with the literature, where Mensah et al. (2019) found that final-year students in clinical disciplines are more likely to be vaccinated due to greater exposure to disease risks during their training. The lower yellow fever vaccination rates in non-clinical disciplines may reflect lower perceived risks or less emphasis on vaccination in their curricula.

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The impact of employment status on vaccination was evident, with full-time employed trainees having a lower yellow fever vaccination rate (50%) compared to part-time employed (70%) and non-employed trainees (75%). This finding aligned with the study by Li et al. (2020), which highlighted that full-time employment often limited students' availability for vaccination due to conflicting schedules. The low yellow fever vaccination rate among fully employed trainees suggested the need for more flexible vaccination schedules or on-campus vaccination opportunities.

Socioeconomic status also influenced yellow fever vaccination uptake, with trainees from high-income families showing an 83.3% vaccination rate, while those from middle-income and low-income families had lower rates (69% and 80%, respectively). This finding was consistent with Johnson et al. (2021), who reported that students from higher socioeconomic backgrounds have better access to private healthcare services, facilitating higher vaccination rates. The relatively lower rate among middle-income trainees indicated gaps in access or awareness that need to be addressed through subsidized vaccination programs.

Knowledge of Health Trainees towards Yellow Fever and Vaccination

A majority (57.5%) of respondents identified yellow fever as a viral disease, and 97.5% correctly noted that the vaccine primarily protects against yellow fever. This reflected a strong foundational knowledge, which is essential for future health professionals. Studies such as Olatunji et al. (2021) in Abuja also reported similarly high levels of awareness among health trainees regarding the viral nature of yellow fever. Regarding yellow fever transmission, 72.5% of the respondents correctly identified that yellow fever is primarily transmitted through mosquito bites. This finding is comparable to the 75% reported by Wong et al. (2019), emphasizing the need for awareness about mosquito vector control as a preventive measure.

However, there were some knowledge gaps, particularly regarding the symptoms of yellow fever. While most students were familiar with common signs and symptoms of yellow fever like fever and jaundice, 65% incorrectly identified rash as a sign of yellow fever. This indicated a misunderstanding of the disease's clinical presentation, which could hinder early diagnosis and treatment. Similar gaps were observed in a study by Li et al. (2020) in Beijing, where health trainees struggled to accurately recognize the symptoms of tropical diseases.

Students' knowledge of when and where to receive the yellow fever vaccine was generally strong, with 52.5% aware that yellow fever vaccination should occur at the recommended age and with boosters as needed. This aligned with Adjei et al. (2020), who found that awareness of optimal vaccination timing was crucial for effective disease prevention.

The concept of herd immunity was understood by 62.5% of the respondents, with most recognizing it as the protection offered when a large portion of the population is immune. This is an important finding, as understanding herd immunity can encourage health professionals to promote vaccinations. Zhang et al. (2021) in Beijing similarly emphasized the importance of educating health trainees on herd immunity to bolster public health efforts.

Conclusion.

This study assessed the knowledge, and vaccination status of health trainees at the Mildmay Institute of Health Sciences regarding yellow fever.

The results revealed that a majority of the trainees (72.5%) were vaccinated against yellow fever. However, the remaining 27.5% of the health trainees were not vaccinated suggestive of a prevalence gap. Knowledge about yellow fever transmission, prevention, and the role of vaccination was generally high, with 97.5% of respondents correctly identifying the purpose of the yellow fever vaccine. Gaps were found in understanding the clinical presentation of yellow fever, particularly symptoms, as well as in the broader concept of herd immunity. While most trainees were aware of the mosquito-borne transmission of yellow fever, confusion regarding specific symptoms such as rash was prevalent. Many respondents understood the importance of vaccination, but there was a need for more in-depth knowledge of herd immunity and its role in public health. Overall, the study concluded that while there was fairly high vaccination coverage and baseline knowledge among health trainees, targeted educational interventions are needed to address the knowledge gaps related to disease presentation and herd immunity.

Recommendations

Based on the findings of this study, several recommendations can be made to improve yellow fever vaccination coverage, knowledge, and preparedness among health trainees at the Mildmay Institute of Health Sciences:

Enhance Educational Programs on Yellow Fever and Vaccination: The knowledge gaps identified, particularly around the symptoms of yellow fever and the concept of herd immunity, indicated a need for enhanced training. The curriculum should incorporate more comprehensive content on infectious diseases, focusing on yellow fever transmission, symptom recognition, vaccination benefits, and public health principles like herd immunity. Interactive learning sessions, such as workshops or simulations, could be used to reinforce this knowledge.

Promote Awareness of Vaccine Protocols and Timing: Although vaccination coverage was high, a significant portion of students lacked detailed knowledge about the timing of vaccinations and the need for boosters. Clear communication regarding recommended vaccination schedules, including booster doses and the ideal timing for receiving the vaccine, should be prioritized. Integrating this

information into regular training sessions will help ensure that trainees are fully prepared and protected before engaging in clinical practice, especially in endemic areas.

Increase Accessibility to Vaccination Services within the Institution: To sustain and potentially improve vaccination coverage, the institute should consider offering regular on-site vaccination services, particularly for incoming first-year students and those who have not been vaccinated. Given the positive correlation between accessibility and vaccination uptake, ensuring that vaccination services are easily available within the institution will likely improve the vaccination rate and reduce reliance on external facilities.

Strengthen Public Health Campaigns and Messaging: Trainees should be encouraged to participate in public health campaigns related to yellow fever and other preventable diseases. This would not only enhance their understanding of the global and regional efforts in vaccination but also prepare them as advocates for public health within their communities. Information about the global and regional vaccination initiatives should be readily available through seminars, guest lectures, or institutional communications.

Tailor Vaccination Schedules to Accommodate Employment Commitments: Given that some trainees reported part-time or full-time employment, it was recommended that vaccination services and educational sessions be scheduled flexibly to accommodate their work commitments. Offering evening or weekend vaccination clinics and educational workshops may help improve both knowledge and vaccination rates among working students.

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List of Abbreviations

CDC: Centres for Disease Control and Prevention
MOH: Ministry of Health - Uganda
UNICEF: United Nations International Children's Emergency Fund
UNMEB: Uganda Nurses and Midwives Examination Board
WHO: World Health Organization
YFV: Yellow Fever Vaccination

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The author declares no conflict of interest.

Author contributions

Martha Tubenawe, principal investigator
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Data availability

Data is available upon request.

Author Biography

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