AfroGlobal Perspectives
Vol. 3 No. 2 (2026): May 2026
https://doi.org/10.70572/agp.v3i2.11
Original Article

Diphtheria, pertussis, and tetanus 3 uptake by children below two years attending the young child clinic at Apac General Hospital. A cross-sectional study.

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Abstract

Background:

The widespread use of vaccines for immunization has resulted in the global eradication of smallpox, the elimination of polio and measles from many countries. The study aims to determine the factors influencing DPT3 uptake by children below 2 years attending YCC at Apac Hospital in Apac District.

Methodology:

A descriptive cross-sectional design was employed, and 36 participants were selected using a simple random sampling method. Data was collected using questionnaires. Data was analysed manually by the use of papers and pens and tallied. The results were presented in tables, graphs, and pie charts generated by Microsoft Excel 2007.

Results:

Most participants were within the required age of 25-30 years (42%), (n=15, 41.7%) were coming from a distance of 3-4 kilometres to the hospital, (n=16, 44.4%), had a low level of education, and finally, the majority of the participants reported no vaccines as a reason for non-vaccination n=10 (56%). (77.8%), have heard of DPT3, (58%) heard of DPT3 vaccination from the hospital. (89%) do think that the vaccine is safe. 30 (83.3%) have been told to take their children for the DPT3 vaccination. (66.7%) were told to take their children for DPT3 from the hospital. The majority of the respondents were given the information on the DPT3 vaccine by the health worker, n=31 (86.1%). (77.8%) went for the second and third injections of the DPT vaccine (77.8%), and very few participants did not go for the second and third injections

Conclusion:

Low maternal level of education and no vaccines at the clinic or health facilities greatly affected the uptake of DPT3 vaccines.

Recommendation:

Parents' attitudes towards education should be addressed, and the Ministry should ensure a constant supply of vaccines to the health facilities.

Keywords: *DPT3 uptake, Children below 2 years, YCC at Apac Hospital.*
Submitted: *March 19, 2026* ***Accepted:*** *April 20, 2026* ***Published:*** *May 30, 2026*
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Background

Immunisation is the most successful and cost-effective public health intervention employed today (CDC, 2011). The widespread use of vaccines for immunisation has resulted in the global eradication of smallpox, the elimination of polio and measles from many countries. Coverage with the third dose of diphtheria-pertussis-tetanus vaccine (DPT3) is a widely used indicator of the performance of countries' routine immunisation services (Nakayiza, 2018).

Globally, immunisation is one of the most cost-effective strategies in reducing child mortality, as endorsed in 2012 by the Global Vaccine Action Plan (GVAP), with 194 member states of the World Health Assembly, the aim was to strengthen the immunisation coverage, up to 90%, to reduce the under-five mortality rate. However, in 2015, the World Health Organisation (WHO) estimated that only 86% of the world's children received three doses of diphtheria-tetanus pertussis (DTP3) vaccine (Ahmad et al., 2017).

Coverage with the third dose of diphtheria-pertussis-tetanus vaccine (DPT3) is a widely used indicator of the performance of countries' routine immunisation services. In 2014, Indian children accounted for 22% of the 18.7 million children worldwide who had not received three doses of DPT by age one year (Ghosh and Laxminarayan, 2017). Immunisation is the world's most successful and cost-effective public health intervention, as it prevents over 2 million deaths annually. However, over 2 million deaths still occur yearly from vaccine-preventable diseases, the

majority of which occur in sub-Saharan Africa. Nigeria is a major contributor to global childhood deaths from VPDs. To date, Nigeria still has wild polio virus in circulation (Oleribe et al., 2017).

In Africa, the immunisation coverage is still low, and yet immunisation prevents up to 2–3 million deaths among under-5 children worldwide. In Nigeria, only 25% of children aged 12–23 months are fully immunised. The remarkable disparities in the uptake of immunisations, as the overall figures for: diphtheria, pertussis, and tetanus vaccine first dose (DPT1) = 49.8%, DPT3 = 38.2%, measles = 41.8%, and full immunisation = 24.9%. (Olorunsaiye and Degge, 2016). The study aims to determine the factors influencing DPT3 uptake by children below 2 years
attending YCC at Apac Hospital.

Methodology

Study Area and Rationale

The study was conducted in Apac Hospital in Apac town, Apac Municipality, after seeking permission from the medical superintendent of Apac Hospital and the DHO of Apac district. Apac Hospital was established in 1968, with a capacity of 100 beds. It is found in Apac town, Apac Municipality, in the northern region of Uganda. The hospital has a catchment population of 368,626 people, with females accounting for 187631, and males 180995 (National population and housing census 2014), serving the Apac district and parts of the neighbouring districts of Kole, Kwania, Oyam, Kiryandongo, and Nakasongola. Apac District is bordered by Oyam District to the north-east, Kole District to the north, Lira District to the north-east, Dokolo District to the east, Amolatar District to the south, Nakasongola District to the south-west, and Kiryandongo District to the west. Apac Hospital is in Apac Municipality (the major business town of Lango sub-region), located 257.5 kilometres north of Kampala (the capital city of Uganda), and 187631 of its catchment population are female. The economic activities carried out in Apac include agro-pastoral livelihood, poultry keeping, fishing, animal keeping like cattle, pigs, rabbits, and goats, as well as crops like millet, sorghum, cassava, simsim, beans, ground nuts, maize, sweet potatoes, sunflower, and soya beans. New crops, especially fruits like oranges and passion fruits, have also been introduced (Mpiima et al.2019).

The study area was chosen because records of Apac hospital show that only 47 per cent of children below two years have fully completed DPT3 vaccines according to HMIS 106b. No study has been done to shed light on the subjective problems at Apac Hospital. Also, it is convenient for the study during data collection, transcription, and translation since he speaks the language of the supposed participants in the study area.

Study design

The study design was cross-sectional in nature, employing quantitative methods of analysis. The study design was chosen because data were collected at one point in time.

Study population

The study participants were all the mothers who had come to YCC. Those whose children were admitted to the pediatric ward, mothers with children at OPD, who came to seek medical help in the hospital, nurses, and midwives in Apac Hospital.

Sampling procedure

A simple random sampling technique was used to select the respondents for the study. Pieces of paper with the words YES and NO were written, folded, and placed in an enclosed box, then shaken afterwards. Potential respondents were invited by the study to participate by picking a piece of paper from the enclosed box, and any respondent who picked a paper with the word YES written on it was requested to participate. The method is selected because it requires minimal knowledge of the population.

Sample size determination

Yamane's (1967:886) formula was used to estimate the sample size

n = N/1+N (e) 2

Where, n = required sample size e= Level of precision 0.05 at 95% confidence interval N = Population Size

Total number of healthcare workers in the government payroll of Apac Hospital = 40, excluding those on study leave, annual leave, and sick leave

Therefore; n= 40/1+40 (0.05)2 = 40/1+40 (0.0025) = 40/1+0.1 n= 40/1.1 = 36

So the sample size is 36 respondents

Sampling Procedure

The study used a simple random sampling procedure to select the required number of respondents for the study at Apac General Hospital. In this procedure, the study wrote the words YES and NO on pieces of paper, placed them in an enclosed box, shook it, and then offered potential respondents an opportunity to participate by picking papers from the box. Any respondent who picked a paper with the word YES written on it was requested to participate in the study. This continued until the total number of respondents to be interviewed per day was achieved. The study sampled 10 respondents per week for three weeks, and in the 4th week, six respondents were sampled, making a total of 36 respondents for 4 weeks.

Inclusion criteria

The study included mothers of children below 2 years of age seeking immunisation services at Apac hospital, who would be sampled and consented to participate in the study.

Exclusion criteria
The study excluded mothers of children below 14 weeks and above 2 years of age.
The study also excluded mothers of children below 2 years who were mentally incapacitated.

Data collection tools
An interview guide with questionnaires was designed by the study. The questionnaires were formulated to obtain data in relation to the study objectives.

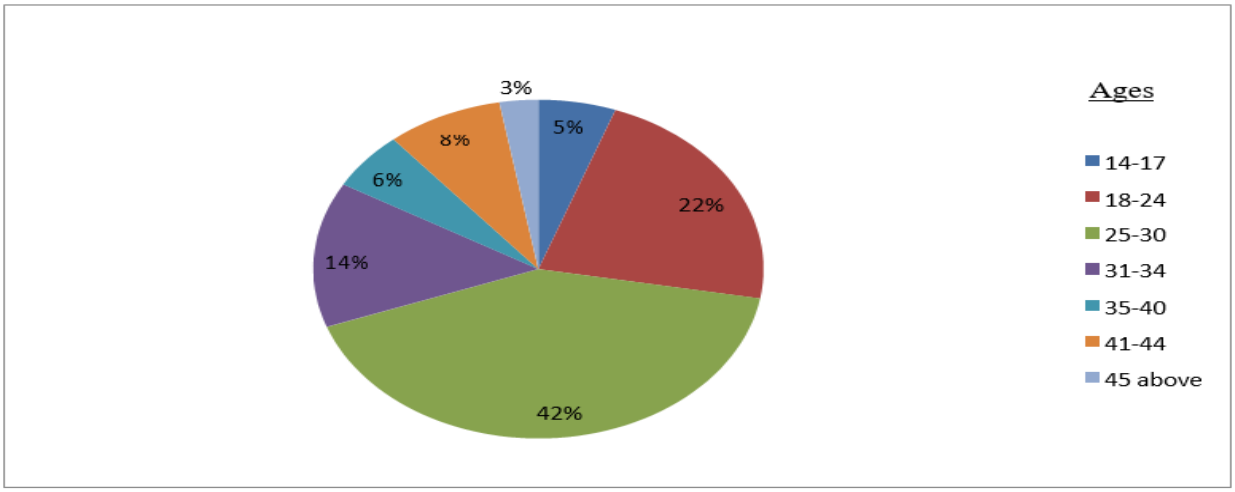
Data collection procedures
After permission was obtained from the Medical superintendent, the study obtained consent from potential participants in YCC. The study was accompanied and introduced to the respondents by the person in charge of YCC and other departments. The study introduced itself, as well as the purpose and objectives of the study, to the respondents. This improved efficiency and confidentiality during data collection.
Data was generated using questionnaires administered by the researcher, and informed consent was obtained from respondents before the interview. The study assured the respondents of the confidentiality of the information that would be obtained from them by not writing their names on the questionnaires. At the end of filling out the questionnaires, respondents were thanked.

Data analysis
Data was analysed manually by the use of papers and pens and tallied. The results were presented in tables, graphs, and pie charts generated by Microsoft Excel 2007.

Ethical considerations
Approval to conduct the study was obtained from the Florence Nightingale School of Nursing and Midwifery. The introductory letter from the school was given and taken to the study area, and permission was obtained from the medical superintendent of Apac hospital, who introduced the study to the wards and YCC departments. The purpose of the study was explained to each participant. They were requested to consent before participation in the study. They were informed that the participation was voluntary and they were free to withdraw anytime they wished. This would not affect their relationship with the study. Participants would be told that the information that was obtained from them would be kept confidential, no names should be used except codes, and the data collected would be kept under lock and key by the study.

Results

Figure 1: showing the distribution of participants by age



The majority of the respondents, 15 (42%), were in the age range of 25-30 years, while 1 (3%) was in the age range of 45 years and above.

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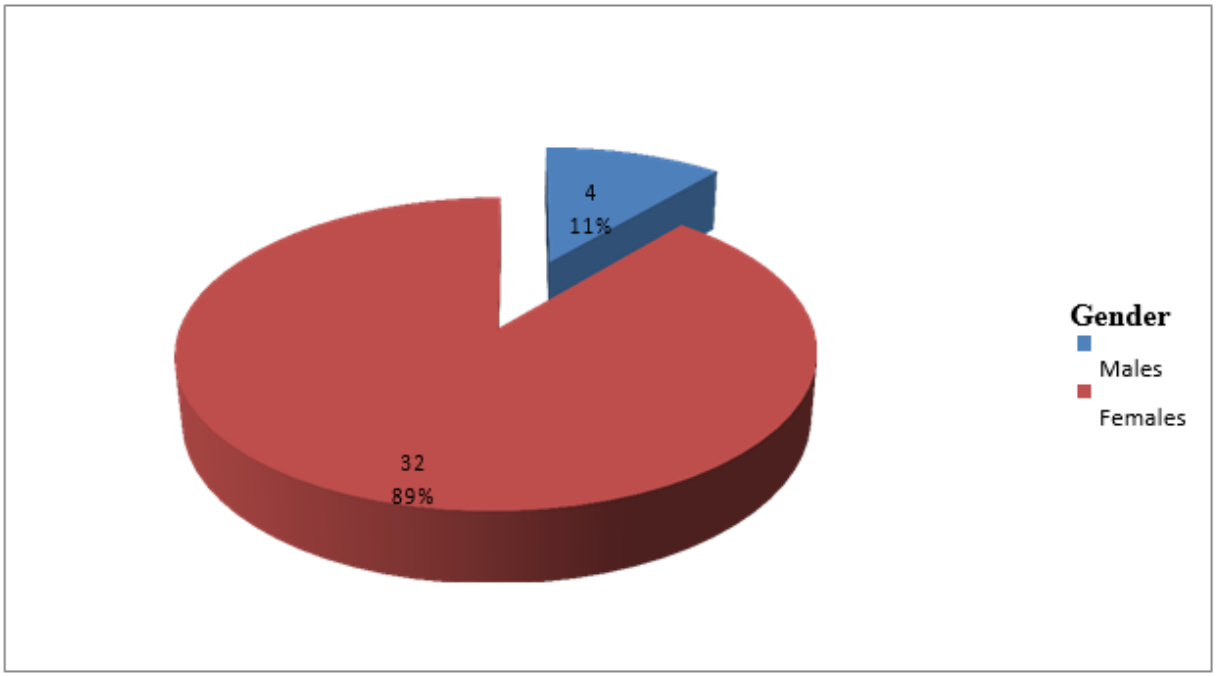
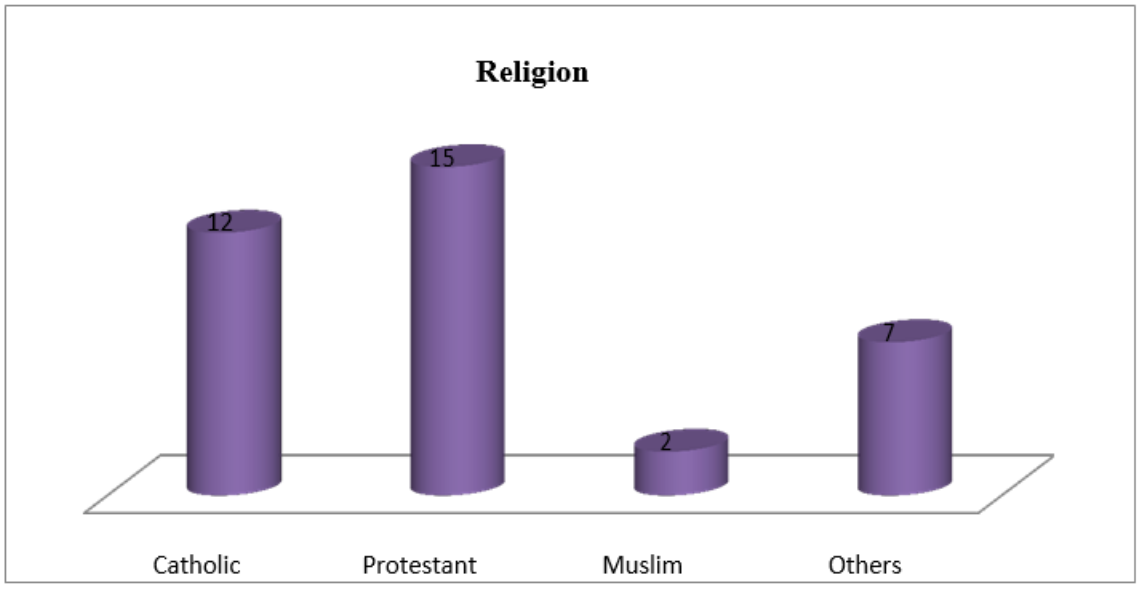
Figure 2: showing the distribution of respondents by gender



A total of 32(89%) of the respondents were females, and 4(11%) were males.

Figure 3: showing the distribution of the respondents by religion



A total of 12 (33%) were Catholic, 15 (42%) were Protestant, 2 (5.6%) were Muslim, and 7 (19.4%) fell under other religions.

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Table 1: showing the distribution of respondents by their levels of education

Levels of education	Frequency	Percentages (%)
Never went to school	9	25
Primary level	16	44.4
Secondary level	9	25
Tertiary level	2	5.6
Total	**36**	**100**

The majority of the participants have attained only a primary level of education, n=16 (44.4%), while very few participants have attained a tertiary level of education, n=2 (5.6%).

Table 2: showing the status of the road from the respondent's home to the hospital

Status of the road	Frequency	Percentages
Good road status	10	27.8
Fair road status	20	55.5
Poor road status	6	16.7
Total	**36**	**100**

The majority of the respondents have fair road status to the hospital, n=20 (55.5%), while less than half of the participants have poor road status to the hospital, n=6 (16.7%)

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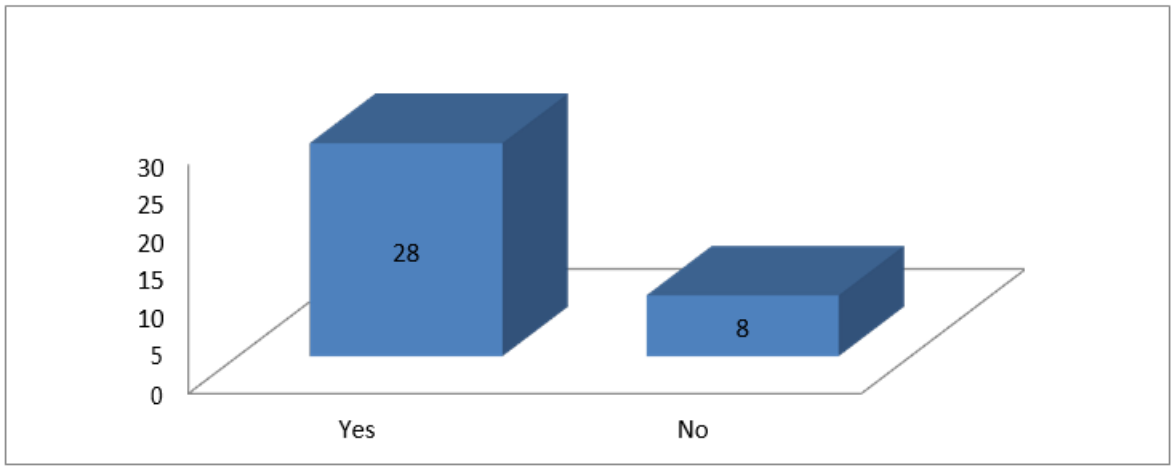
Individual factors

Figure 4: showing participants who had heard of the DPT3 vaccination



The majority of the participants, n=28 (77.8%), have heard of DPT3, while less than half of the participants, n=8 (22.2%), did not hear of DPT3.

Table 3: showing where DPT3 vaccination was heard

Where it was heard	Frequency	Percentage (%)
Hospital	21	58.3
Radio	9	25
Home	6	16.7
Total	**36**	**100**

More than half of the participants heard of DPT3 vaccination from the hospital, n=21 (58%), while less than half of the participants heard of DPT3 from home, n=6 (16.7%)

Table 4: showing what they heard about DPT3

What was heard	Frequency	Percentage (%)
Prevents diphtheria, pertussis, and tetanus	30	83.3
Prevents cough	3	8.3
Nothing	3	8.3
It kills people	0	0
Total	**36**	**100**

The majority of the respondents heard that DPT3 prevents diphtheria, pertussis, and tetanus, n=30 (83.3%)

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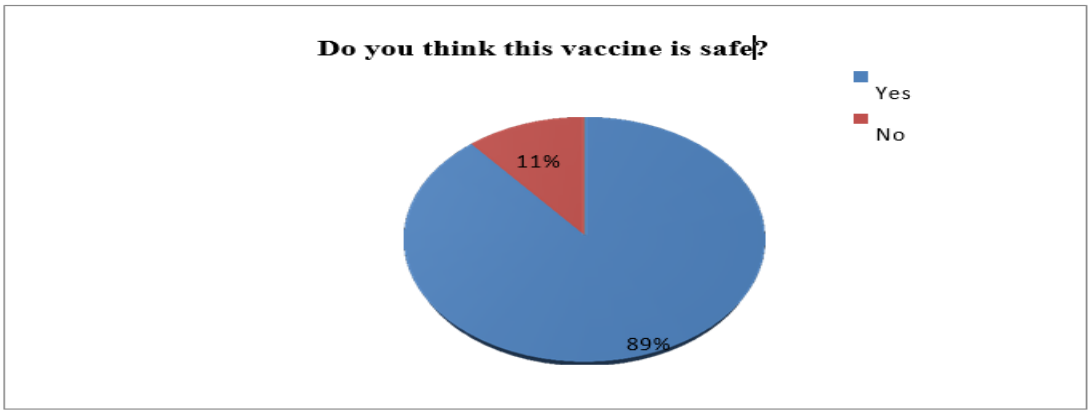
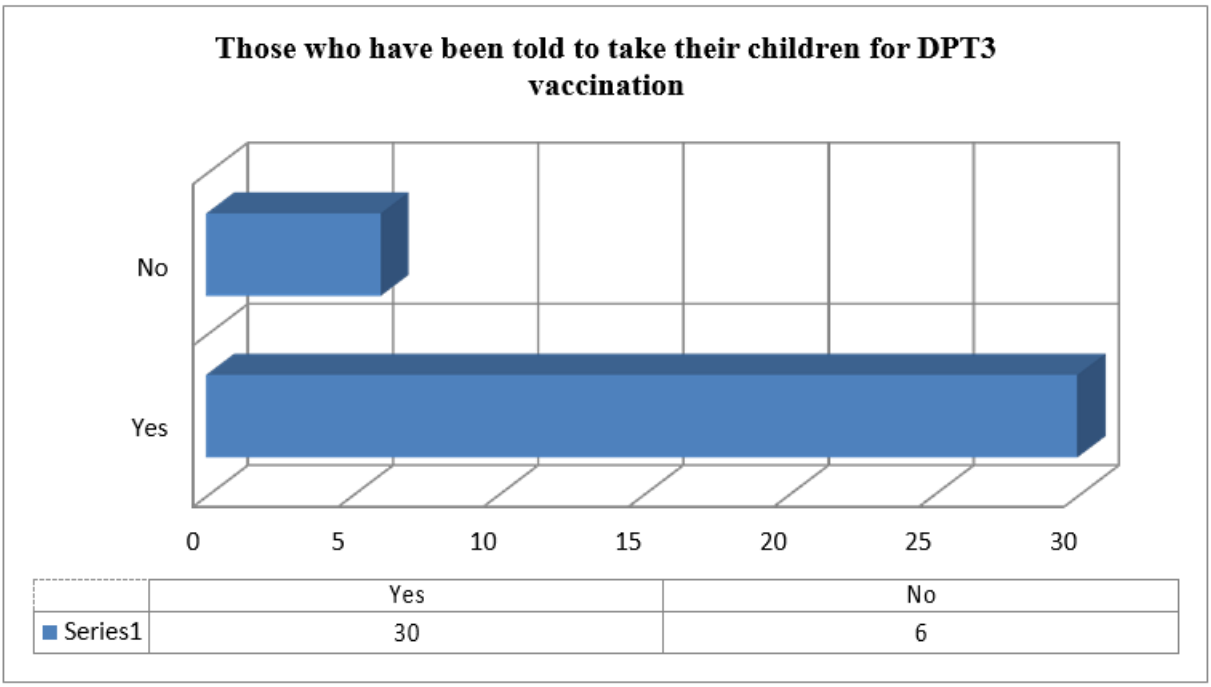
Figure 5: showing participants' response towards the safety of the vaccine



More than half of the participant do think that the vaccine is safe, n=32 (89%)

Figure 6: showing respondents who were told to take their children for the DPT3 vaccination



The majority of the participant have been told to take their children for the DPT3 vaccination, n=30 (83.3%)

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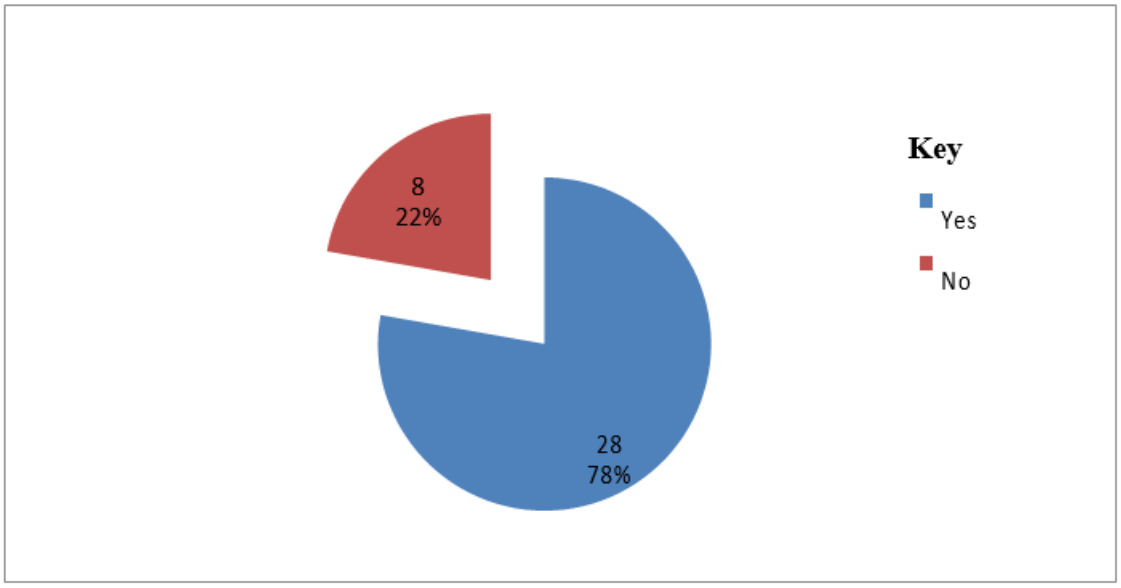
Table 5: Showing where the participant has been told to take their children for the DPT3 vaccination

From where	Frequency	Percentage (%)
Home	8	22.2
Hospital	24	66.7
Radio	4	11.1
Total	**36**	**100**

The majority of the respondents were told to take their children for DPT3 from the hospital, n=24 (66.7%), while only a few of the respondents were told over the radio to take their children for DPT3 vaccination, n= 4 (11.1%).

Fig 7: **Showing participant who have ever taken their children for DPT vaccination**



The majority of the participants, n=28 (78%), took their children for DPT vaccination.

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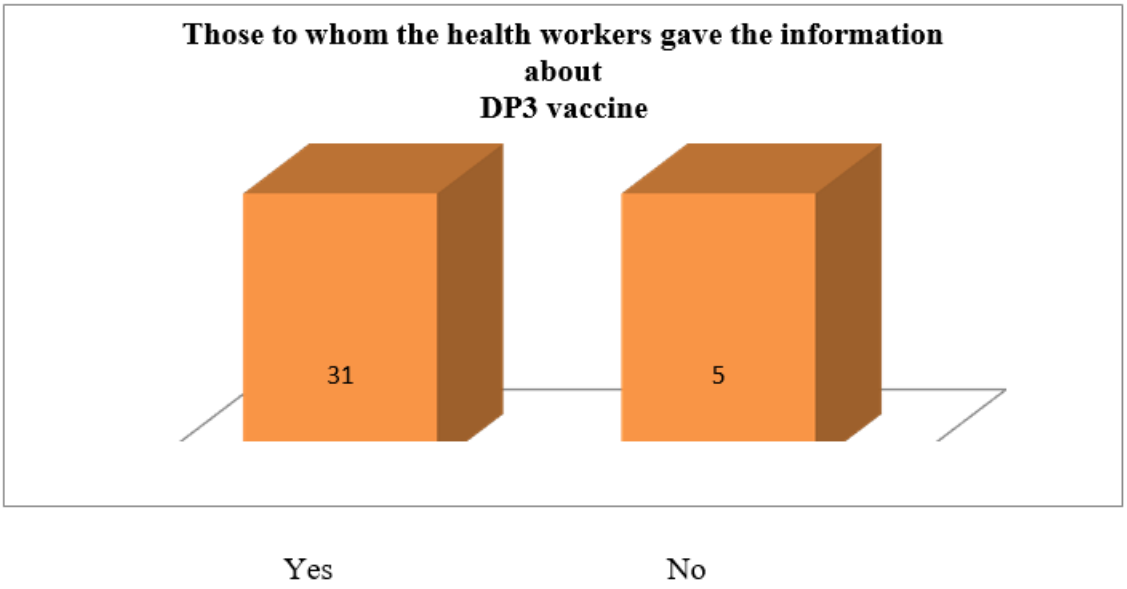
Table 6: Showing how many times participants took their children for the DPT vaccination.

How many times	Frequency	Percentages (%)
One time	18	50
Two Times	12	33.3
Three times	6	16.7
Total	**36**	**100**

The majority of the participants took their children only once for DPT3 vaccination, n=18 (50%), while very few participants took their children three times for DPT3 vaccination, n=6

Health facility factors

Figure 8: showing respondents to whom health workers gave information about the DPT3 vaccine.



The majority of the respondents were given the information on the DPT3 vaccine by the health worker, n=31 (86.1%).

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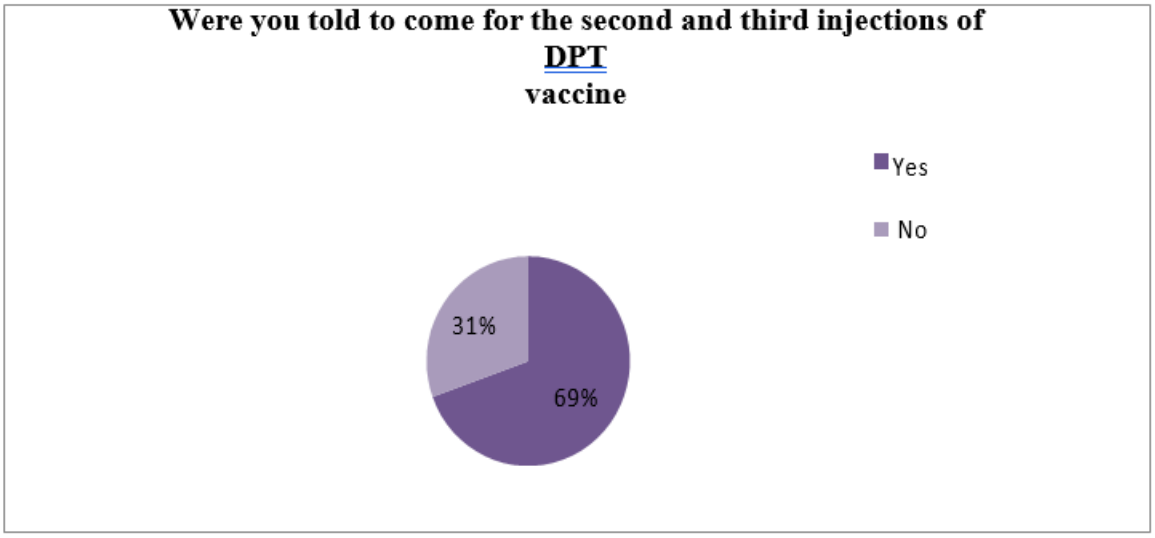
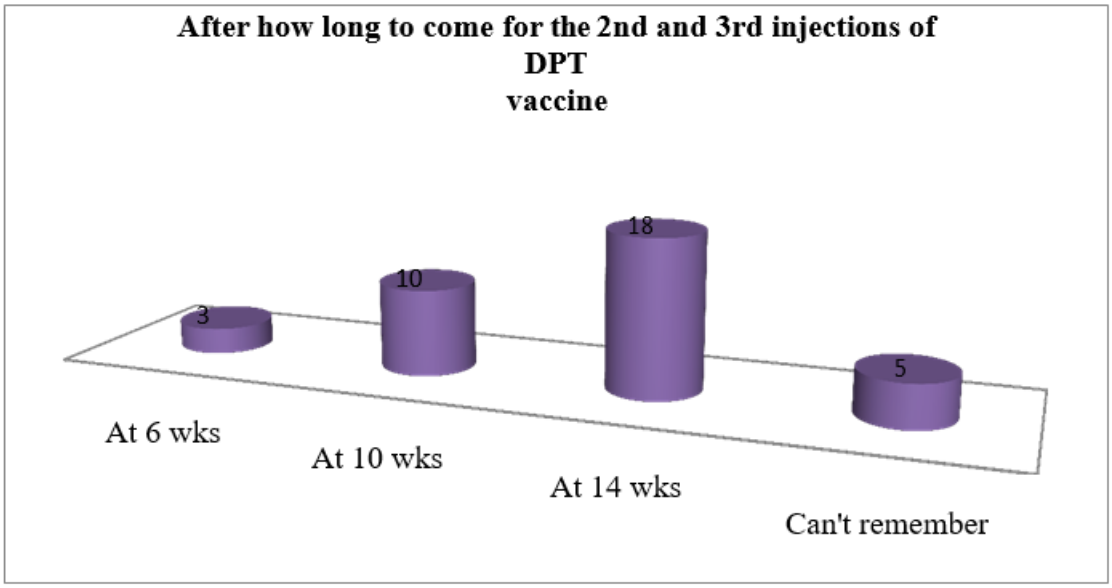
Fig 9: Participants who were told to come for the second and third injection of the DPT vaccine.



The majority of the participants were told to come for the second and third injection of the DPT vaccine, n=25 (69%)

Fig 10: Showing how long participants came for the 2nd and 3rd injection of the DPT Vaccine.



The majority of the participants reported that they were told to come for the second and third injection of the DPT vaccine at 14 weeks, n=18 (50%), while a few participants reported that they couldn't remember how long they were to take their children for the second and third injection of the DPT vaccine, n=5 (13.9%)

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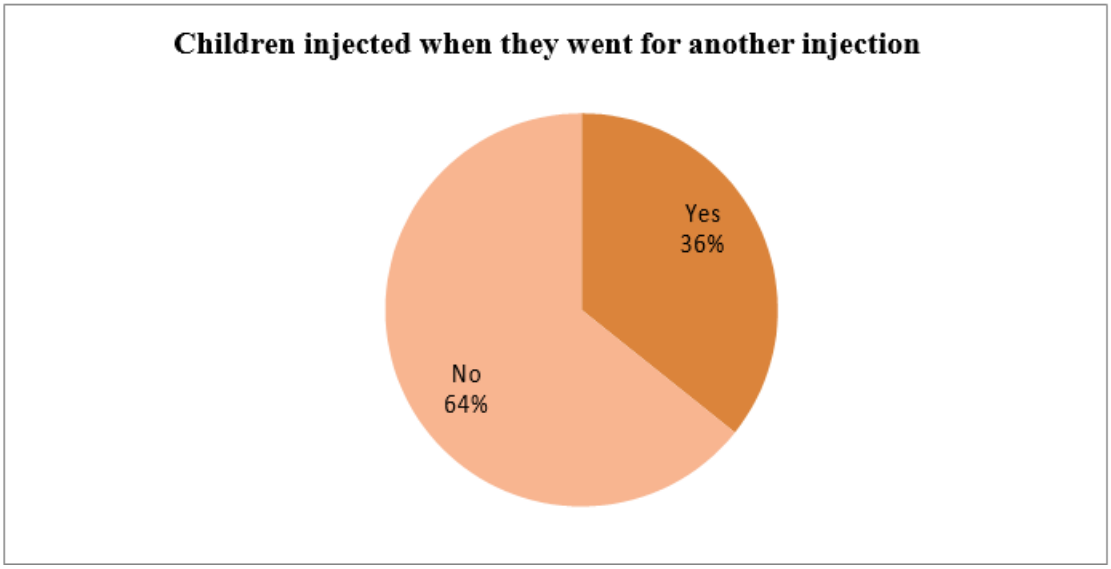
Table 7: Showing participants who went for the second and third injections of the DPT vaccine

Those who went for the second and third injections of DPT vaccine	Frequency	Percentage (%)
Yes	28	77.8
No	8	22.2
Total	**36**	**100**

The majority of the participants went for the second and third injection of the DPT vaccine, n=28 (77.8%), and very few participants did not go for the second and third injection of the DPT vaccine, n=8 (22.2%).

Figure 11: Showing participants whose children were injected when they went for another injection.



The majority of the participants reported that their children were not injected when they went for another injection, n=18 (64%), while less than half of the participants reported that their children were injected when they went for another injection, n=10 (36%)

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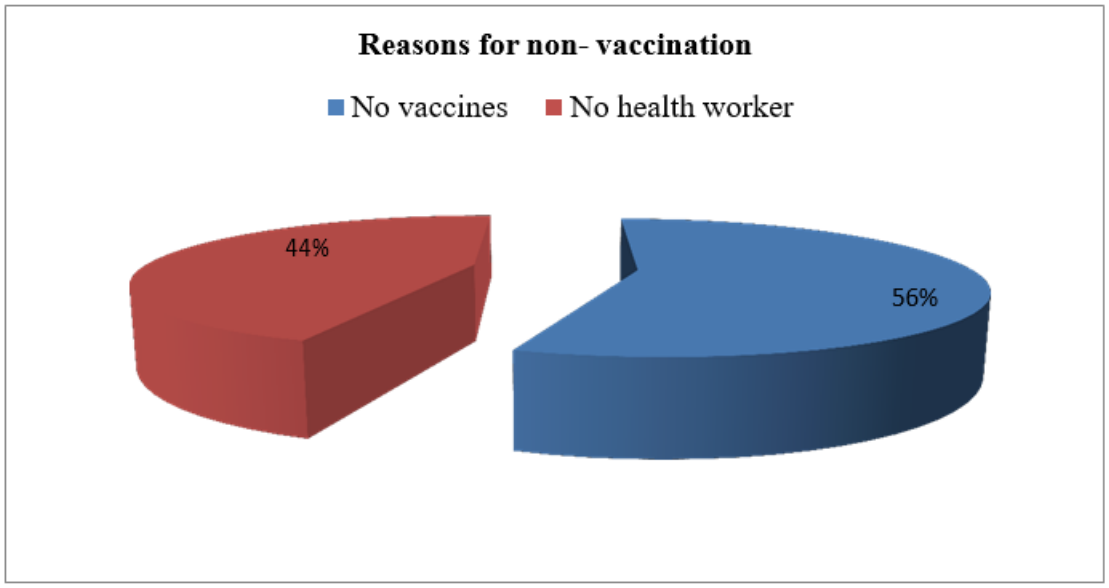
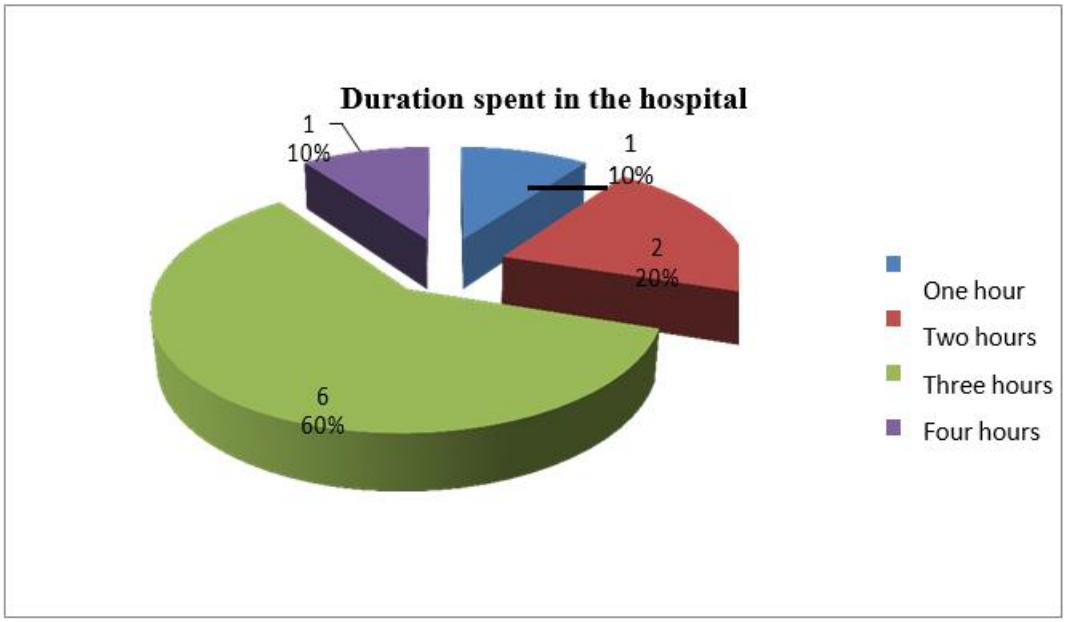
Figure 12: Showing participants whose children were not injected when they went for the second and third injections.



The majority of the participants reported no vaccines as a reason for non-vaccination, n=10 (56%), and a few participants reported no health worker as a reason for non-vaccination, n=8 (44%).

Fig 13: Showing the duration spent in the hospital for those whose children were injected



The majority of the participants reported spending two hours in the hospital before their children were injected, n=6 (60%), while very few participants reported spending one hour before receiving the injection, n=1 (10%).

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Table 8: Showing the distance from the participant's home to the hospital

Distance	Frequency	Percentage (%)
1-2 kilometers	8	22.2
3-4 kilometers	15	41.7
5-6 kilometers	13	36.1
Total	**36**	**100**

The majority of the participants reported coming from a distance of 3-4 kilometres to the hospital, n=15 (41.7%), a few participants reported coming from a distance of 1-2 kilometres, n=8 (22.2%)

Discussion

The findings in this study showed that the majority of the participants were coming from a distance of 3-4 kilometres to the hospital, n=15 (41.7%), which is quite far from home compared to a few participants who were coming from a distance of 1-2 kilometres, n=8 (22.2%). In the distribution of health facility services. This study is supported by the one done by Olorunsaiye and Degge (2016) in Nigeria, which found that full immunisation was negatively associated with far distance to the clinic.

This study found that the majority of the participants had a low level of education, n=16 (44.4%), while very few participants had a high level of education, n=2 (5.6%). These were associated with poor attitudes to education. This study was supported by the one done in Kakamega Central, Western Kenya, by Sunguti et al. (2016), who found that immunisation coverage was higher among caregivers who had completed secondary school (88%). Similarly, the study carried out in Uganda by Ssebagereka et al. (2022) also found that the main drivers for the lack of vaccination shifted from supply-side factors, such as the availability of vaccines at clinics, to more demand-side factors, which are primarily maternal education. He later emphasised that while maintaining the regular provision of vaccines to all regions, efforts should be made to alleviate the impact of low maternal education.

According to this study, the majority of the participants went for the second and third injection of the DPT vaccine, n=28 (77.8%), and very few participants did not go for the second and third injection of the DPT vaccine, n=8 (22.2%). This could be that they don't know how relevant completing the dose is. This was contrary to the study carried out in Nadiad city by (Jariwala, 2015) that revealed: "Unaware of need to return for 2nd and 3rd dose" (20%) and "No faith in Immunization (16%), as the main reason for poor vaccination status.

Health facility-related factors

The majority of the participants reported no vaccines as a reason for non-vaccination, n=10 (56%), and a few participants reported no health worker as a reason for non-vaccination, n=8 (44%). Sometimes, the vaccine supply may not be constant. This study was in agreement with the study carried out in India by Ghosh and Laxminarayan (2017), who found that incomplete immunisation was due to the unavailability of drugs (vaccines), no health workers, and long waiting times.

In this study, however, more than half of the participants do think that the vaccine is safe, n=32 (89%). Because the WHO and the government, through the MoH, can't provide anything harmful to the people. These findings are contrary to the study done in Somalia by Samakab (2020), who revealed that cultural perception of vaccine safety and religious influence were inadequate for the population.

Conclusion

DPT3 vaccination uptake is low due to low maternal level of education and the lack of vaccines at the clinic or health facilities.

Recommendations

There is a need to improve on supervision and monitoring of vaccination programs, especially of DPT3 vaccines, among children below two years of age, as recommended by the Ministry of Health, Uganda.

The attitudes of parents and their children towards education should be addressed to counteract the low level of education encountered in this study.

The MoH should ensure a constant supply of vaccines to health facilities.

The MoH should ensure equal distribution of health facility services to address the issue of long distances to the facility, which in most cases hinders the completion of the immunisation schedule.

Acknowledgement

Acknowledgement goes to the Almighty God for his love, providence, and guidance during my studies at Florence Nightingale School of Nursing and Midwifery.

Great thanks to my family, especially my wife and children, for their support during the course of my research

Sincere thanks to my supervisor, Mr Omara Tonny Mike, for all the valuable guidance and time right from proposal development and writing to the dissertation.

To the Medical Superintendent, Principal Nursing Officer, and all other staff of Apac Hospital, thank you for the guidance and contributions made towards this study.

To all the in-charges of different wards and units for their endless effort rendered during data collection.

Finally, I extend my appreciation to all my friends for their support.

List of abbreviations

CDC Centres for Disease Control and Prevention
DPT3 Diphtheria Pertussis and Tetanus Third dose
OPD Outpatient Department
VPDs Vaccine Preventable Diseases WHO World Health Organisation
YCC Young Child Clinic

Source of funding

The study was not funded.

Conflict of interest

The author did not declare any conflict of interest.

Data availability

Data is available upon request.

Author contribution

Alfred Obote Tom collected data and drafted the manuscript of the study
Mike Omara Tonny supervised the study

Author biography

Alfred Obote Tom is a student at Florence Nightingale School of Nursing and Midwifery.
Mike Omara Tonny is a supervisor at Florence Nightingale School of Nursing and Midwifery.

References

1. AHMAD, N. A., JAHIS, R., KUAY, L. K., JAMALUDDIN, R. & ARIS, T. 2017. Primary immunization among children in Malaysia: reasons for incomplete vaccination. *J Vaccines Vaccine,* 8**,** 2.https://doi.org/10.4172/2157-7560.1000358
2. GHOSH, A. & LAXMINARAYAN, R. 2017. Demand-and supply-side determinants of diphtheria-pertussis-tetanus nonvaccination and dropout in rural India. *Vaccine*, 35**,** 1087-1093.https://doi.org/10.1016/j.vaccine.2016.12.024
3. JARIWALA, P. D. 2015. Study on identification of determinants of childhood immunization uptake in the urban slum population of Nadiad city of district Kheda, Gujarat. *International Journal of Management & Social Science,* 3**,** 114-137.
4. NAKAYIZA, M. F. 2018. *Factors Associated With Uptake Of DPT 3 Immunization Amongst Children Aged 6-12 Months In Kawempe–MBOGO Village, Kawempe Division, Kampala District.* International Health Sciences University.
5. OLERIBE, O., KUMAR, V., AWOSIKA-OLUMO, A. & TAYLOR-ROBINSON, S. D. 2017. Individual and socioeconomic factors associated with childhood immunization coverage in Nigeria. *The Pan African Medical Journal,* 26.
6. OLORUNSAIYE, C. Z. & DEGGE, H. 2016. Variations in the uptake of routine immunization in Nigeria: examining determinants of inequitable access. *Global Health Communication,* 2**,** 19-29.https://doi.org/10.1080/23762004.2016.1206780
7. SAMAKAB, J. A. 2020. *Determinants of Vaccination Uptake among Children aged 12-24*
8. *Months in Afgoi Town, Somalia*. JKUAT-COHES.https://doi.org/10.1155/2020/5827074
9. SSEBAGEREKA, A., DE BROUCKER, G., EKIRAPA-KIRACHO, E., KANANURA, R. M., DRIWALE, A., MAK, J., MUTEBI, A. & PATENAUDE, B. 2022. Equity in vaccine coverage in Uganda from 2000 to 2016: Revealing the multifaceted nature of inequity.https://doi.org/10.21203/rs.3.rs-2002082/v1
10. SUNGUTI, J. L., NEAVE, P. E. & TAYLOR, S. 2016. Family factors associated with immunisation uptake in children aged between twelve and fifty-nine months: a household survey in Kakamega Central district, Western Kenya. *Healthcare in Low-resource settings,* 4.https://doi.org/10.4081/hls.2016.5447

AfroGlobal Perspectives
Vol. 3 No. 2 (2026): May 2026
https://doi.org/10.70572/agp.v3i2.11
Original Article

PUBLISHER DETAILS

AfroGlobal Press

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