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ASSESSMENT OF PHARMACY STUDENTS' AWARENESS OF NEGLECTED TROPICAL DISEASE AND THEIR ATTITUDE TOWARDS PARTICIPATING IN ITS PREVENTION AND CONTROL

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ABSTRACT

Outbreaks of some Neglected Tropical Diseases (NTDs) are on the increase in Nigeria. As future healthcare professionals, pharmacy students need to be equipped with the required knowledge and skills for management of NTDS. This study aims to assess pharmacy students' awareness of NTDS and their attitude towards participating in its prevention and control. A cross-sectional study was conducted on 408 pharmacy students of the University of Nigeria, Nsukka, with the aid of a three-sectioned, structured questionnaire using a convenient sampling method. Section A obtained demographic information of respondents. Section B assessed the students' awareness of NTDs. Section C assessed the students' attitude towards participation in the prevention and control of NTDs. The collected data was entered into a Microsoft Excel spreadsheet for data cleaning, after which it was exported into the IBM SPSS software for inferential and descriptive analysis. The p-value was set at < 0.05, at a 95% confidence interval. Half (204, 50%) of the respondents were males; 201 (49.3%) were between the ages of 18 and 29 years, while 209 (49.3%) were in the BPharm program. Most (313; 76.7%) of the respondents were not aware of NTDS. The majority (305, 74.9%) had not received lectures or training that provides information on NTDs; 328 (80.6%) will want the study of NTDs to be included in their undergraduate pharmacy program; and 211 (51.7%) had negative attitudes toward participation in the prevention and control of NTDs. The pharmacy students were not aware of the NTDS and had a negative attitude towards participation in their prevention and control. There is need for review of undergraduate pharmacy curriculum for an effective prevention, control, and elimination targets of NTDs to be achieved.

KEYWORDS: Neglected tropical diseases; pharmacy students; knowledge; attitude, Nigeria.

INTRODUCTION

Neglected tropical diseases (NTDs) are a group of infections that could lead to debilitating illnesses that disproportionately affect the world's poorest populations (Tanguy, 2020). Despite their high prevalence and local disease burden, they are often overlooked and neglected by the global health community (FMOH, 2012). NTDs occur under tropical and subtropical climate conditions and are linked to poverty and weak healthcare systems (Ochola *et al*., 2021). They primarily impact impoverished populations, particularly in low-and middle-income countries (Htay *et al*., 2024), affecting vulnerable and often marginalized populations (Diallo *et al*., 2024). They are caused by a variety of pathogens, which include viruses, bacteria, fungi, and toxins. They include Buruli ulcer, leishmaniasis, echinococcosis, Chagas disease, dengue, chikungunya, dracunculiasis, leprosy, lymphatic filariasis, mycetoma, chromoblastomycosis and other mycoses, schistosomiasis, and onchocerciasis. Rabies, snake bite envenoming, soil-transmitted helminth infections, trachoma, scabies, and other ectoparasites (https://www.who.int/health-topics/neglected-tropical-diseases#tab=tab_1).

Pharmacists are involved in the management of patients in the hospital, and community pharmacists are usually the first point of contact for patients in times of disease conditions. As essential healthcare providers, pharmacists play a vital role in promoting the safe and effective use of medications for both the treatment and prevention of NTDs. Their responsibilities encompass various aspects of NTD management, including dispensing medications and monitoring adherence, ensuring drug safety through pharmacovigilance, promoting antimicrobial stewardship and rational drug use, supporting community-based interventions, and providing health education (Al Abbas *et al*., 2024).

There has been an increase in the outbreaks of some NTDs in Nigeria (WHO, 2013). These recent events have revealed the unreadiness of health workers in the management and control of these diseases due to a lack of information about these diseases. A recent study from Nigeria shows that healthcare workers have insufficient knowledge of NTDs, highlighting the need for regular training, continued education, and supportive supervision for PHC workers (Emeto *et al*., 2021). Educating pharmacy students about NTDs is essential and will contribute to the prevention and control programs. It is imperative to ascertain their awareness and knowledge of NTDS, as there are no studies in that regard done in Nigeria. This study assessed the pharmacy students' knowledge and awareness of NTDS and their attitude towards participating in its prevention and control.

METHODS

Study Design

A cross-sectional study conducted on pharmacy students with the aid of a structured questionnaire using a convenient sampling method.

Study Setting

The study was conducted in the Faculty of Pharmaceutical Sciences, University of Nigeria Nsukka (UNN), Enugu state, Nigeria. The Faculty of Pharmaceutical Sciences comprises of seven departments and offers two pharmacy programs: Bachelor of pharmacy (B. Pharm) and Doctor of Pharmacy (Pharm.D.). Each study year comprises about 200 students.

Study Instrument

This study was conducted with a structured questionnaire which had three (3) sections; Section A, B, and C. The questionnaire was developed and assessed for face and content validity by four experts, two each in clinical pharmacy and public health. The reliability and internal consistency study were conducted using Cronbach's Alpha.

Section A obtained demographic information of respondents. Section B obtained information on the awareness of NTDs. In this section the respondent is to answer "Yes" or "No" to each of the item questions. The "Yes" responses were scored "1" while "No" responses were scored "0". Section C assessed the students' attitude towards participation in the prevention and control of NTDS. The item questions in this section were anchored on a 5-point Likert scale: "strongly agree" (SA), "agree" (AG), "undecided" (UD), "disagree" (DA), and "strongly disagree" (SD). The responses were scored "5"," 4", "3', "2", and ''1" respectively. The responses were expressed as percentages and categorized into "positive attitude" and "negative attitude" using the mean as a cut-off point.

A pilot study was conducted on fifty students in the department of microbiology to ensure that the questionnaire was easily understood and obtained the desired information. Data from the pilot study is not part of the result.

Inclusion and Exclusion Criteria

Pharmacy students in their 2nd, 3rd, 4th, and 5th years of study who consented to participate in the study were included in the study. Non-pharmacy students, pharmacy students in their first year of study, and pharmacy students who did not consent to be part of the study were exempted from the study.

Data Collection

The questionnaires were distributed to every pharmacy student in 2nd, 3rd, 4th, and 5th year who gave consent to participate in the study to ensure proper representation of all the students in each study year. The questionnaires were distributed to students in the lecture theatres immediately after lectures. Students were given 10 minutes to respond. The questionnaires were then retrieved and kept in a brown envelop. Confidentiality and anonymity were maintained all through the study. The students were informed that they could withdraw from the study at any point in time if they so desire.

Data Analysis

A Microsoft Excel spreadsheet was employed for data cleaning. Data was exported into the IBM SPSS software for inferential and descriptive analysis. Frequencies, means, and percentages were used to summarize the data. Chi-square was used to determine association between respondents' characteristics and the dependent variable at a p- value of < 0.05 and a 95% confidence interval.

Ethical Consideration

Ethical approval for this study was obtained from the Research and Ethics Committee of the Faculty of Pharmaceutical Sciences, University of Nigeria Nsukka, with the reference number FPSRA/UNN/23/0068. Verbal and written consent was obtained from the respondents before they were recruited into the study.

RESULTS

Out of the six hundred (600) questionnaires that were given out, only 408 were returned and found usable, giving a response rate of 68%. The questionnaire had a Cronbach's alpha coefficient of 0.78.

Socio-demographic characteristics of respondents

Socio-demographic characteristics of respondents (n=408) are as follows:

Gender

Male (frequency=204, percentage=50%)

Female (frequency=204, percentage=50%)

Age

18-23 (frequency=201, percentage=49.3)

24-29 (frequency=167, percentage=40.9)

30-34 (frequency=36, percentage=8.8)

≥35 (frequency=4, percentage=0.9)

Year of study

2nd year (frequency=105, percentage=25.6)

3rd year (frequency=100, percentage=24.5)

4th year (frequency=101, percentage=24.8)

5th year (frequency=102, percentage=25)

Degree

BPharm (frequency=209, percentage=49.3)

PharmD (frequency=199, percentage=48.8)

Awareness of neglected tropical diseases

Out of 408 respondents, only 94 (23.1%) were aware of NTDs, while 313 (76.7%) were not aware of them. A majority, 305 (74.9%), have not received lectures or training that provides information on NTDs, while 328 (80.6%) will want the study of NTDs to be included in their undergraduate pharmacy program. Details are in Table 1 below.

Table 1: Awareness of NTDs (n=407).

Questions	Frequency	
	Yes (%)	No (%)
Are you aware of NTDs	94 (23.1)	313 (76.7)
Is the study of NTDs included in your school curriculum?	117 (28.7)	290 (71.3)
Did you receive any lecture or training that provides information on NTDs?	102 (25.1)	305 (74.9)
Have you participated in any program on NTDs prevention and control	19 (4.7)	388 (95.3)
Have you received or completed any course on NTDs prevention and dissemination of information	93 (22.9)	314 (77.1)
Will you want the study of NTDs to be included in your undergraduate pharmacy program?	328 (80.6)	79 (19.4)

Information on pharmacy students' awareness of NTDS

Out of the twenty (20) identified NTDs in Nigeria (WHO, 2025), only fourteen of them have been heard of by the pharmacy students. A few pharmacy students 113 (27.8%) correctly mentioned at least one of the NTDS. Trachoma was the most mentioned, then trypanosomiasis 9 (8.0%) and schistosomiasis 8 (7.1%), while the least mentioned were dengue fever 1 (0.9%) and rabies 1 (0.9%). Figure 1 shows the information of students' awareness of the NTDS.

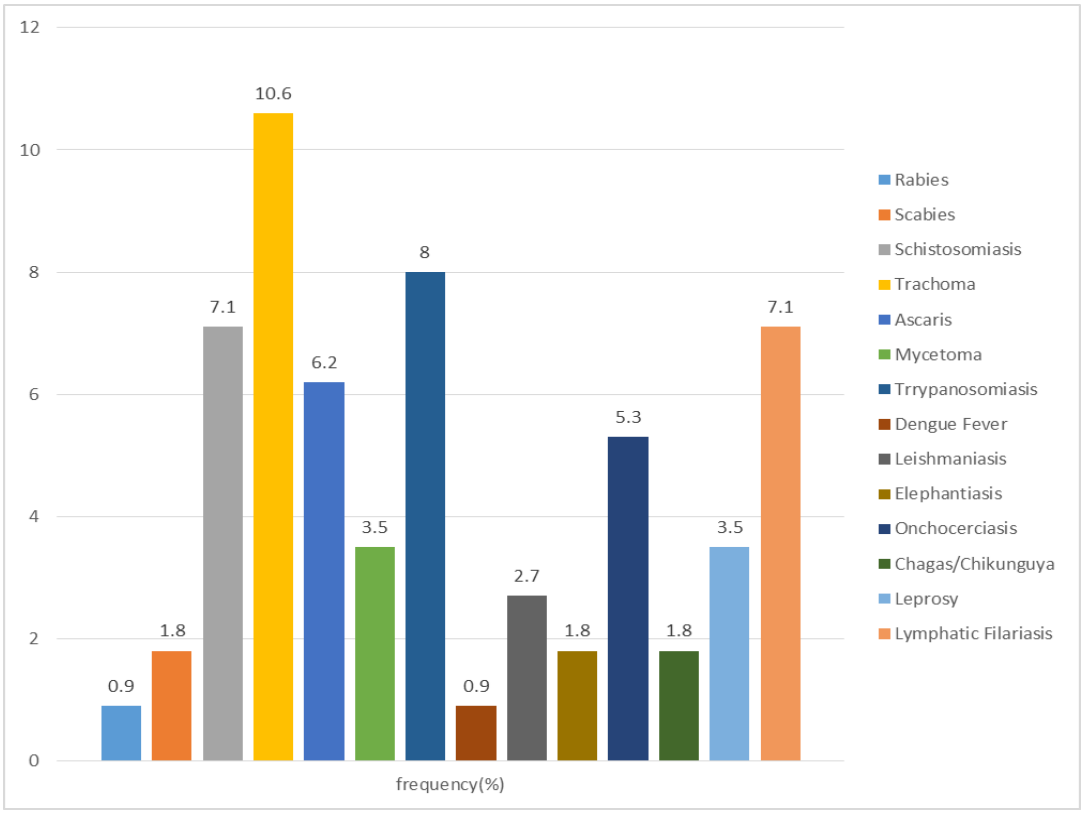

Fig. 1: Information on pharmacy students' awareness of NTDS.

Attitude of undergraduate pharmacy students towards neglected tropical diseases

Findings from this study show that the pharmacy students 211 (51.70%) had a negative attitude toward their role in the prevention and control of NTDs, as shown in fig. 2 below. The mean attitude score of the respondents is 84.8922 ± 13.35. However, 190 (46.6%) respondents strongly agreed that it is important for pharmacy students to have adequate training and skills required for the control and prevention of NTDs, while 192 (47.1%) respondents strongly agreed that the study of NTDs should be included in the undergraduate curriculum. Details are as shown in Table 2.

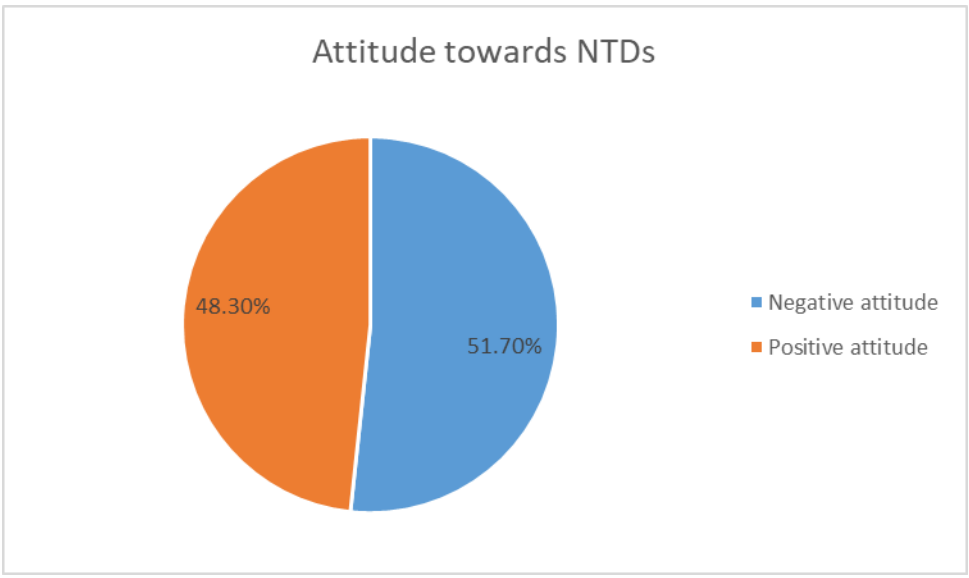

Fig. 2: Attitude of the respondents towards their role in the prevention and control of NTDs.

Table 2: Attitude of pharmacy students towards their role in NTDs prevention and control.

Questions	Strongly Disagree (%)	Disagree (%)	Neither agree nor disagree (%)	Agree (%)	Strongly Agree (%)
It is important to include the study of NTDs in the undergraduate pharmacy curriculum	10(2.5)	11(2.7)	31(7.6)	164(40.2)	192(47.1)
The current knowledge that pharmacy students have is inadequate for their participation in the prevention and control of NTDs	6(1.5)	38(9.3)	58(14.2)	170(41.7)	136(33.3)
Pharmacists have an important role to play in the prevention and control of NTDs	5(1.2)	8(2.0)	25(6.1)	173(42.4)	197(48.3)
Specialized knowledge and skill in the field of public health is needed by pharmacists to play an active role in the prevention and control of NTDs	4(1.0)	9(2.2)	21(5.1)	193(47.3)	181(44.4)
It is important for pharmacy students to have adequate training and be involved in the prevention and control of NTDs	5(1.2)	9(2.2)	22(5.4)	182(44.6)	190(46.6)

Association between the students' socio-demographic characteristics and their attitude towards their role in the prevention and control of NTDs

The male pharmacy students, the students in their 5th year of study, and the students in the Bachelor of Pharmacy study program had more positive attitudes towards their role in prevention and control of NTDs compared to their counterparts, although there was no significant difference in the attitude between these students (p = 0.276, 0.164 and 0.072 respectively). Details are shown in Table 3.

Table 3: The relationship between students' socio-demographic characteristics and their attitude towards their role in preventing neglected tropical disease is shown in Table 4 (Authors' own, 2025).

Variables	Negative Attitude	Positive Attitude	$\chi^{2\,(df)}$	p-value
Gender			1.118(1)	0.276
Male	100	104		
Female	111	93		
Age			3.152(3)	0.369
18-23	104	98		
24-29	84	83		
30-34	20	16		
≥35	3	0		
Year of study			5.103(3)	0.164
2nd	58	46		
3rd	56	45		
4th	54	47		
5th	43	59		

DISCUSSION

This study revealed that a higher proportion of the pharmacy students had a low level of awareness of NTDs and a negative attitude towards their role in its prevention and control.

Male students, students in their 5th year of study, and the students in the Bachelor of Pharmacy (B. Pharm) study programs had more positive attitudes. This could be because these students engage in some healthy extracurricular activities such as joining groups, societies, and NGOs like ISPOR in their 5th year of study. Their involvement in these pharmaceutical societies and activities often exposes them to some knowledge and information that they may not have acquired in classrooms.

The study shows that pharmacy students have not received any lecture or training on NTDs. Contrary to the findings from a study conducted by Htay *et al*, 2024 in five Asian countries which confirmed that 50.6% among medical students and 51.9% non-medical students learned about NTDs from their study program buttressing the need for incorporating studies of NTDs into the undergraduate pharmacy curriculum. It is believed short courses and training, research, advocacy, and sufficient funding were needed to reduce the burden of NTDs (Htay *et al*., 2024).

Pharmacy students in the study had a negative attitude towards their role in participating in the prevention and control of NTDs, which contradicts the findings from a study conducted among some students in five Asian countries where the medical and non-medical students expressed willingness to participate in NTD prevention and public health programs (Htay *et al*., 2024). The negative attitude observed in the pharmacy students who were within the age of 18-23 years in this study could be attributed to inexperience and lack of information on the role of pharmacists in the prevention and control of NTDs (Ngunyali *et al*., 2022).

In this study, there was no association between the student's characteristics and their attitude towards their role in the prevention and control of NTDs.

It is important to introduce NTDs during the study period, especially in the health sciences programs, to equip students with the skills and knowledge necessary for their role in patient care and pharmaceutical care service delivery. A recent study from Nigeria shows that healthcare workers have insufficient knowledge of NTDs, highlighting the need for regular training, continued education, and supportive supervision for PHC workers (Emeto *et al*., 2021). Equipping pharmacists with adequate knowledge and skills will boost their confidence, increase their involvement in the prevention and control of NTDs and other public health programs, and will be beneficial for interdisciplinary efforts to develop sustainable solutions. Studies in LMICs highlight the need to incorporate NTDs into medical education and professional training, with a particular focus on the most prevalent NTDs. Strengthening knowledge in this area will enhance the active participation of key stakeholders in prevention and control initiatives (Rahman *et al*., 2023).

With increased awareness and collaboration between the medical and allied health sectors, the effective prevention, control, and elimination targets of NTDs will be achieved (Htay *et al*., 2024). Therefore, studies of NTDs—identification, diagnosis, management, prevention, and control measures— should be included in the undergraduate pharmacy program curriculum in terms of lectures, seminars, and debates by the policymakers and education regulatory bodies.

RECOMMENDATION

The study of NTDS should be included in the undergraduate curriculum of pharmacy students. Students should be encouraged to take part in some extracurricular pharmacy activities. There may be a need for symposiums and awareness programs to be organized for the students where renowned public health pharmacists will be invited to deliver lectures.

LIMITATIONS OF THE STUDY

This study was a cross-sectional study that obtained the information at a point in time. Hence the possibility that the responses may differ if the study is conducted at a different time from the time of this study.

CONCLUSION

The pharmacy students are not aware of the NTDS. They have a negative attitude towards their role in the prevention and control of these diseases. They will want the study of NTDs to be included in their undergraduate pharmacy program.

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