Knowledge and Preventive Practices Against Pulmonary Tuberculosis Amongst Young Adults of Randomly Selected Churches Within the Niger Delta Diocese in Rivers State, Nigeria

Glory Conelius, Rosemary Chisom Osuala, Justin Ngwu, Eunice Osuala, Basil Ogbu, Florence Mandah

Department of Respiratory, Newcastle Upon Tyne Hospital, Newcastle, North East England

DOI: https://dx.doi.org/10.47772/IJRISS.2025.91100222

Received: 20 November 2025; Accepted: 30 November 2025; Published: 05 December 2025

ABSTRACT

Global statistics from Pubmed suggests that young adults remain a significant but under-recognized population with Pulmonary tuberculosis (PTB). A systematic review found bacteriologically confirmed pulmonary TB prevalence ranging from 45 to 799 per 100,000 among adolescents and young adults in Asia-Pacific, and 160 to 462 per 100,000 in African settings. Snow, K. J., etal 2018).

Globally, it is estimated that between 1.2 and 3.0 million people aged 10–24 years develop TB each year. This highlights the fact that young adult's age bracket accounts for a substantial portion of the global Tuberclosis (TB) burden.

The findings of the 2023 World Tuberculosis Report, hold thats Nigeria is ranked sixth among the identified 30 nations with highest cases of tuberculosis (TB) burden around the world, and the first in her continent Africa. (WHO Global TB Report 2024)

The study herein was carried out to assess the knowledge and preventive practices against pulmonary tuberculosis (PTB) amongst young adults (15-26) in selected churches within the Niger Delta Diocese of Rivers State, Nigeria.

Objectives:

Three objectives were formulated to guide this study and they include;

i. To ascertain if young adults know about pulmonary tuberculosis in the selected churches

ii. To assess the precautionary measures taken against pulmonary tuberculosis

iii. To identify the socio-demographic factors influencing pulmonary tuberculosis knowledge among young adults.

Hypothesis: One null hypothesis was formulated to guide association.

Study design: A descriptive cross-sectional research design was adopted.

INTRODUCTION

Pulmonary tuberculosis (PTB) is a leading cause of illness and mortality worldwide1. In 2021, an estimated 2.5 million persons in Africa contracted tuberculosis2 . Furthermore, in 2021, 1.6 million persons died from tuberculosis. Furthermore, the occurrence rate of tuberculosis increased by 3.6% in 2021 compared to 2020, indicating a reversal from the tendency of nearly 2% decline per year during the previous two decades3, yet the United Nations Sustainable Development Goals (SDG)4 primarily aim to reduce tuberculosis deaths by 90% by 2030. Since the early twentieth century, TB rates have been documented to climb dramatically in young people. The majority of young adults globally live in low- and middle-income countries, where tuberculosis remains

endemic, accounting for 25% of the population. Despite this, young adults have not been regarded as a distinct demographic in tuberculosis policy or treatment programs, and new research reveals that current care models may not satisfy their needs5.

Bacilli Calmette-Guerin (BCG) inoculation or vaccination is now the only vaccine that provides modest protection against tuberculosis infection, and it frequently loses effectiveness during childhood6 . One of these approaches, particularly in Nigeria, resulted in the acceptance of Directly Observed Therapy Short Course (DOTS) as a TB control technique. It was revealed that approximately 5,000 DOTs facilities had been established in Nigeria, with the goal of providing free tuberculosis diagnosis and treatment to underprivileged areas7. The rising incidence of tuberculosis (TB) is related with greater health impairment, and patient mortality is a severe issue for society. This was supported by the findings of Nigeria's Health Minister, Dr. Osagie Ehanir 8, who declared Nigeria having a 50% increase in annual tuberculosis case notification in 2021, with numbers increasing from 138,591 cases in 2020 to 207,785. Nigeria has the highest tuberculosis burden in Africa and sixth in the world9 .

The importance of the knowledge of pulmonary tuberculosis especially among young adults has been captured by some authors in their studies under two (2) targets; (i) redressing their poor knowledge about the signs and symptoms of PTB, as well as introducing the Bacilli Calmette Guerin (BCG) vaccine10, (ii) changing their poor adherence to treatment processes and the preference of traditional healers over the freely available standard and free medical care7 .

The lead researcher has observed a concerning trend of young adults visiting the PTB unit at the Rivers State University Teaching Hospitals to receive treatment for pulmonary tuberculosis when she was posted at the TB unit. This trend suggests a gap in knowledge and prevention practices within this geographic. Furthermore, the decline in Bacilli Calmette Vaccine (BCG) immunization in young adults is an important point of concern. The BCG vaccine, which protects against severe types of tuberculosis, is often given throughout children. However, decreasing immunity and a lack of booster doses in maturity may enhance young individuals' susceptibility to pulmonary tuberculosis11. The young adults form a greater percentage of our populace.

Methods

The descriptive cross-sectional sampling technique was adopted. Sample size of 180 was using Taro Yamane formula. The instrument for data collection was a validated self-structured questionnaire. Ethical approval was obtained. The data was analysed using SPSS version 27. ANOVA was used to test for hypothesis at a 0.05 level of significance.

Results

The result show that the respondents have an average knowledge of PTB and a grand mean of 1.62 in the preventive practice. Only 41% received BCG and 88.3% have not gone for routine pulmonary tuberculosis screening. This suggests scaling up of both knowledge and practice of prevention. Level of practice and knowledge have significant relationship with the socio-demographic variables.

Conclusion

There is need for public health nurses, in collaboration with non-governmental agencies to take PTB awareness campaigns, to religious settings where this age bracket is clustered.

Key words: Pulmonary tuberculosis, knowledge, preventive practices, churches.

METHODS

The study aims to assess the knowledge and preventive practices against pulmonary tuberculosis among young adults aged 15-26 years in selected churches within the Niger Delta Diocese, Rivers State, Nigeria. The specific churches included in the study are St. Paul Cathedral, St. Emmanuel Anglican Church, Church of Pentecost, St.

ISSN No. 2454-6186 | DOI: 10.47772/IJRISS | Volume IX Issue XI November 2025

Matthew Anglican Church, St. Thomas Anglican Church, and Alpha and Omega Anglican Church. The study categorizes the young adults into three groups: younger adults (15-18 years), middle adults (19-22 years), and older adults (23-26 years)

A descriptive cross-sectional design was adopted.

The target population of the study comprised a total of three hundred (300) young adults in the 6 selected Anglican churches presently in the membership list. The young adults belong to the age group of 15-27 years. This is the list of the population of young adults in each church:

Table 1: List of churches and respective number

S/N	**Name of Church**	**Number**
1	Cathedral church of St Paul	72
2	St. Thomas Anglican church	62
3	St. Matthew Anglican church	48
4	Alpha and Omega Anglican church	36
5	St. Emmanuel Anglican church	54
6	Church of Pentecost	28
Total		300

The sample size of 188 was calculated using the Taro Yamane formula for a known population.

Taro Yamane: n = N / (1 + N (e)2)

Where: N = Total population

n = sample size

e = the margin error in the calculation

N = 300, n = ?, e = 0.05

n = 300 / (1 + 300 (0.05)2)

n=171.4

For non-response: 171 + 10% of n

171 + 17.1 = 188.1

Therefore, the sample size is 188.

A simple random sampling technique was used to select the six Anglican churches out of the 20 churches in Niger Delta North in Port Harcourt, Rivers State. To randomly select the churches, a RANDBETWEEN formula in Microsoft Excel was used to select the six churches. The 20 churches were arranged in alphabetical order (A-Z), and a number from 1 to 20 was given to each. The numbers picked by the RANDBETWEEN formula were 17, 4, 5, 13, 1 and 20. This allowed every church to be given an equal chance of being selected.

From the six churches, a sample size of 188 was obtained for this study.

Young adults within the age bracket of 15-26 years in the six selected churches who are willing to participate were included in the study. Non-attendees of the six selected churches were excluded.

The face and content validity of the instrument were determined by the researcher's supervisor and two (2) other research experts. The reliability of the instrument was ascertained using a Cronbach Alpha (ra) method, and the value was .872.

Ethical approval was obtained from the Research and Ethics Committee of Rivers State University Teaching Hospital (RSUTH/REC/2023332). Informed consent was obtained from all the participants, and they were informed that it is voluntary and there would be no consequence for participants if they do not want to participate. Confidentiality was ensured.

The instrument utilized for data collection was titled "Knowledge and Preventive Practices against Pulmonary Tuberculosis among Young Adults Questionnaire" (KAPPAPTAYAQ). The instrument was a self-structured 25-itemed instrument patterned after an optional "Yes" and "No" response format. The instrument was in three (3) sections; Section A comprised of seven (7) demographic characteristics, Section B comprised 12 items on the basic knowledge of pulmonary tuberculosis, and Section C comprised of seven (7) items on preventive practices against pulmonary tuberculosis. Subjects were selected purposefully.

Data was collected by face-to-face direct delivery technique, which was used by the researcher and research assistant to effectively explain, and make clarifications (where necessary)

A total of 188 questionnaires were administered, with 182 retrieved, giving a response rate of 96.8%. Out of the 182 retrieved questionnaires, only 180 could be used because the rest were incomplete, giving a data completeness rate of 95.7%. Therefore, the 180 retrieved questionnaires were used and analysed.

The collected data was analysed using a descriptive statistic: frequency, percentage, and mean (with a criterion mean cut-off of 1.5) to answer the research questions. The analysis was done with the aid of Statistical Product and Service Solution (SPSS) 27.0 and Microsoft Excel. ANOVA was used to calculate the hypotheses

Conditions for Decision on the Mean

The criterion mean cut-off for the research questions stated in this study was attained by the total or aggregate of all the scores of the "Yes" and "No" rating scale that was assigned to the items in the instrument. Two-point rating scale was used i: Yes (YES, 2 Points), and No (NO, 1 Point)

The criterion mean cut-off = $\underline{2+1/2} = \underline{3/2} = 1.5$

Therefore, the mean cut-off score was 1.5; hence, items equal and above the score of 1.5 were accepted or rated as positive while items below 1.5 were rated as Negative.Knowledge was categorized into three: low, moderate and high.Values for low knowledge is below 49, moderate knowledge 50 – 74 and high knowledge above 75

RESULTS

Table 2: The demographic characteristics of respondents. n = 180 100%

Items		f	Percent(%)
1. Age group	15 – 18	43	23.9
	19- 22	74	41.1
	23- 26	63	35.0
	Total	180	100
2. Gender	Male	79	43.9

ISSN No. 2454-6186 | DOI: 10.47772/IJRISS | Volume IX Issue XI November 2025

	Female	101	56.1
	Total	180	100
3. Occupation	Student	69	38.3
	Employed	88	48.9
	Self-employed	11	6.1
	Unemployed	12	6.7
	Total	180	100
4. Level of education	Primary	-	-
	Secondary	26	14.4
	Higher education	154	85.6
	Total	180	100
5. Income per month	Below 30,000	35	19.4
	₦31,000- ₦100,000	110	61.2
	Above ₦100,000	35	19.4
	Total	180	100
6. Current Residence	Urban area	154	85.6
	Rural area	26	14.4
	Total	180	100

TABLE 2: This indicates demographic characteristics of the respondents. The demographic characteristics include their age group, gender, income, occupation, education, and current residence. The majority, 41.5%, belong to the age group of 19-24. 154 respondents attested to having gotten a higher education. Females were the highest in number, 101 (56.2%). 88 (48.9%) are employed, and 154 (85.6%) of the respondents live in urban regions.

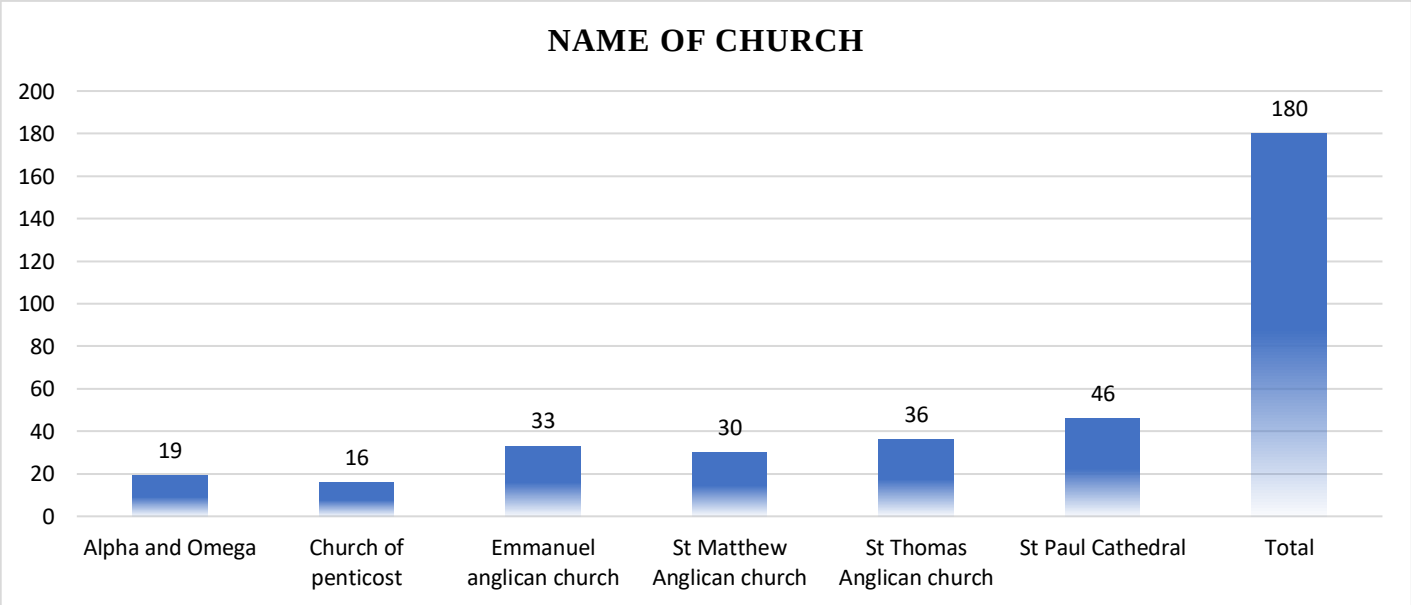

Fig. 1: Church of respondents

Source: Author (Microsoft EXCEL)

ISSN No. 2454-6186 | DOI: 10.47772/IJRISS | Volume IX Issue XI November 2025

Fig .1 Represents the selected six churches used for this study and the number of respondents from each church. Majority of the respondents attend St. Paul Cathedral.

RESEARCH QUESTION 1: What do the young adults know about pulmonary tuberculosis in the selected churches in Niger Delta Diocese, Rivers State?

TABLE 3: The frequency and percentage of the knowledge of pulmonary tuberculosis among respondents
n=180 100%

Items		**f**	**%**
1. Have you heard of pulmonary tuberculosis?	Yes	180	100
	No	-	-
2. What causes pulmonary tuberculosis?	Bacteria	93	51.7
	Virus	27	15.0
	Fungus	25	13.9
	Don't know	35	19.4
3. How is pulmonary TB transmitted from person to person?	Coughing or sneezing	154	85.6
	Sharing food or utensils	9	5.0
	Sexual contact	11	6.1
	Touching contaminated surfaces	6	3.3
4. What are the most common symptoms of pulmonary tuberculosis?	Persistent cough	90	50.0
	Fever	33	18.3
	Weight loss	-	-
	Night sweats	-	-
	All the above	57	31.7
5. Is pulmonary TB a curable disease?	Yes	125	69.4
	No	55	30.5
6. How many doses is given for Bacilli Calmette Guerin (BCG) vaccine	One	67	37.2
	Two	82	45.6
	Three	31	17.2
7. At what age should the BCG vaccine be taken?	Age 2	47	26.1
	Age 5	78	43.3
	At birth	55	30.6
8. Do you know pulmonary tuberculosis can affects other part of your body and lead to death if not treated?	Yes	100	55.6
	No	80	44.4

9. What are the main treatment options for pulmonary TB	Antibiotics	110	61.1
	Surgery	63	35.0
	Traditional/herbal remedies	7	3.9
10. How can pulmonary TB be prevented	Vaccination (BCG)	126	70.0
	Covering the mouth when coughing with your handkerchief	40	22.2
	Avoiding close contacts with TB patients	7	3.9
	Don't know	7	3.9

Source: Author (*SPSS Output*, 2024).

TABLE 3: A significant number of the respondents (52.8%) are aware of pulmonary tuberculosis, and the majority (51.7%) correctly identified bacteria as a cause of pulmonary tuberculosis. On the basis of transmission majority, 85.6% correctly identified coughing or sneezing as the mode of transmission. The most common symptom recognised was persistent cough (50.0%). A significant majority, 69.4%, are aware that pulmonary TB is curable. According to the results, only 37.2% of respondents correctly identified that one dose is given for the BCG vaccine. Only 30.6% of respondents correctly identified that the vaccine should be given at birth. 55.6% recognize the serious nature of untreated pulmonary tuberculosis. 70.0% are aware of the importance of BCG vaccination in preventing TB.

To assess the knowledge of pulmonary tuberculosis of the young adults, the percentage of the total number of respondents that had the correct answers in each item was calculated and divided by the total items: 100 + 51.7 + 85.6 + 31.7 + 69.4 + 37.2 + 30.6 + 55.6 + 61.1 + 70.0 (%) = 592.9/10 = 59.3%. The overall score of 59% falls within the moderate knowledge category (50-79%).

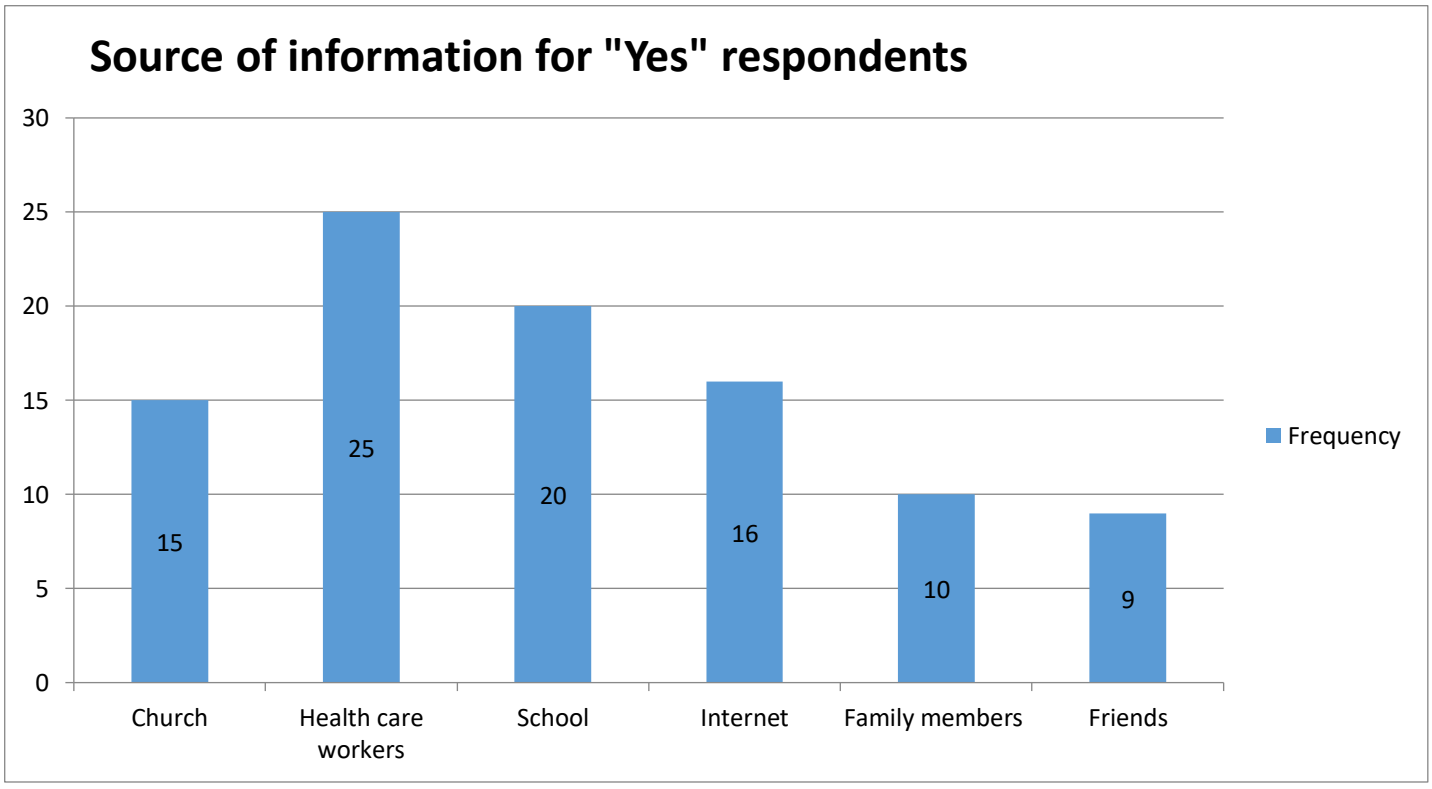

Fig. .2 Frequency of respondent's source of information

Source: Microsoft Excel

Fig 2 : Majority of the respondents had their source of information on pulmonary tuberculosis from health care workers.

RESEARCH QUESTION 2: What are the precautionary measures taken against pulmonary tuberculosis among young adults in the selected churches in Niger Delta Diocese, Rivers State.

Table 4: the frequency and the percentage of preventive practices against pulmonary tuberculosis among the respondents n=180

Items	Yes		No		Mean
	f	%	f	%	
1. Have you received the BCG vaccine against Tuberculosis	75	41.7	31	17.2	1.01
2. Do you cover your mouth and nose when coughing or sneezing	180	100.0	-	-	2.00
3. Do you open the windows and doors to improve ventilation in your living/working space	161	89.4	19	10.9	1.89
4. Do you wear a mask when in a crowded or enclosed space	66	36.7	114	63.3	1.37
5. Have you ever been screened for TB symptoms (e.g. persistent cough, fever, weight loss)	21	11.7	159	88.3	1.12
6. If you had TB symptoms would you seek medical attention	177	98.3	3	1.7	1.98
7. Would you encourage your family and friends to get tested for TB if you notice symptoms	180	100.0	-	-	2.00
GRAND MEAN					**1.62**

YE(Yes) = ≥ 1.50 while No (No) < 1.50.

Source: SPSS Output, 2024

TABLE 4: This table shows the precautionary measures taken against pulmonary tuberculosis among the respondents in the selected churches. The result shows that 41% have received the BCG vaccination, while 41.1% do not know if they have received the BCG vaccination, and 17.2% attested NO to having not received it. All respondents demonstrated a universal adherence to this preventive practice of covering the mouth and nose when sneezing or coughing. Most respondents 89.4% take steps to improve ventilation in their living room or working space. Only 66 respondents about 36.7% wear masks in crowded or enclosed spaces. A small percentage of respondents 11.7% have been screened for TB symptoms showing that majority 88.3% have not undergone screening. Almost all respondents 177 out of 180 (98.3%) would seek medical attention if they had symptoms. All respondents 100.0% would encourage their family and friends to get tested for TB if symptoms were noticed. The grand mean of 1.62 generally suggests a positive practice towards pulmonary tuberculosis prevention. However, the lower rates of mask-wearing and TB symptom screening highlight areas that need improvement.

RESEARCH QUESTION 3: what are the demographic factors that influence young adults' knowledge of pulmonary tuberculosis in the selected churches in the Niger Delta Diocese, Rivers State.

Table 5: Summary of Analysis of Variance (ANOVA) on the difference between the demographic characteristics of young adults and their knowledge of pulmonary tuberculosis.

Demographic Characteristics	Source of Variation	Sum of Squares	df	Mean Square	F	Sig.	Decision
Age group	Between Groups	53.979	18	2.999	9.695	.000	S
	Within Groups	49.799	161	.309			
	Total	**103.778**	**179**				
Gender	Between Groups	24.866	18	1.381	11.428	.000	S
	Within Groups	19.462	161	.121			
	Total	**44.328**	**179**				
Occupation	Between Groups	60.173	18	3.343	8.765	.000	S
	Within Groups	61.405	161	.381			
	Total	**121.578**	**179**				
Income	Between Groups	28.550	18	1.586	6.161	.000	S
	Within Groups	41.450	161	.257			
	Total	**70.000**	**179**				
	Grand Total	**84.921**			**9.012**	**0.000**	**S**

Decision Rule: *if p<.05, retains association between socio-demographic data and knowledge , S=significant . while NS= Not Significant is p>.05.*

Source: *SPSS Output*, 2024.

Table 5 shows that the different demographic characteristics (such as age, gender, education level, and income) of young adults have significant influence on their knowledge of pulmonary tuberculosis in the selected churches in the Niger Delta Diocese, Rivers State, Nigeria (F16, 185=.000, F= 9.012, p<.05). Specifically, age (F18, 161=.000, F= 9.695, p<.05), gender (F18, 161=.000, F= 11.428, p<.05), occupation (F18, 161=.000, F= 8.765, p<.05), and income (F18, 161=.000, F= 6.161, p<.05) all had significant influence on their knowledge of pulmonary tuberculosis in the selected churches in the Niger Delta Diocese, Rivers State, Nigeria. This indicated that the young adults across age, gender, occupation, and income differed in their knowledge of pulmonary tuberculosis in the selected churches in the Niger Delta Diocese, Rivers State. Hence, the different demographic characteristics of young adults significantly influenced their knowledge of pulmonary tuberculosis in the selected churches in the Niger Delta Diocese, Rivers State.

Test Of Hypotheses

Hypothesis: There is no significance difference between the knowledge and the preventive practices of pulmonary tuberculosis among selected churches in Niger Delta Diocese, Rivers State, Nigeria.

Table 6: Summary of Analysis of Variance (ANOVA) on the difference between the knowledge and the preventive practices of pulmonary tuberculosis among selected churches in Niger Delta Diocese, Rivers State.

Source of Variation	Sum of Squares	Df	Mean Square	F	Sig.	Decision
Between Groups	1.175	5	.235	1.166	.328	NS
Within Groups	35.057	174	.201			
Total	**36.232**	**179**				

Decision Rule: *if p<.05 reject H_o, else retain H_o. NS= Not Significant, p>.05, S= significant, p<.05.*

Source: *SPSS Output*, 2024.

Table 6 shows that the knowledge of young adults has no significant influence on the preventive practices of pulmonary tuberculosis among selected churches in Niger Delta Diocese, Rivers State, Nigeria (F5, 174=.328, F= 1.166, p>.05). The null hypothesis was retained. This indicated that the different knowledge possessed by young adults did differ in their rating on the preventive practices of pulmonary tuberculosis among selected churches in Niger Delta Diocese, Rivers State, Nigeria. Hence, there is significant difference between the knowledge and the preventive practices of pulmonary tuberculosis among selected churches in Niger Delta Diocese, Rivers State, Nigeria

DISCUSSION

Knowledge of pulmonary tuberculosis among young adults in the selected churches in the Niger Delta Diocese, Rivers State.

The assessment of knowledge comprised of the awareness, causes, transmission, symptoms, treatment, complications, and prevention of pulmonary tuberculosis and their source of information.

The results on the assessment of knowledge showed that the respondents had a moderate level of knowledge. This is contrary to the study conducted at Saudi Arabia where the respondents had a poor knowledge[12] The robust Nigerian curriculum may have made the difference. More than half of the respondents are aware of pulmonary tuberculosis just like in the study by Maduebo et al[13].

Precautionary measures against pulmonary tuberculosis among young adults in the selected churches in the Niger Delta Diocese, Rivers State.

The result indicated that there is relatively high compliance with certain precautionary measures among the respondents from the selected churches; these practices include covering the mouth/nose when coughing or sneezing, and seeking medical attention if experiencing PTB symptoms. The findings attested respondents having a good ventilation practise. More than half of young adults practice proper ventilation. This is consistent with the work by Wikkurendra et al[14].where it was revealed that the activity of opening windows every morning is a way to prevent pulmonary tuberculosis, This is because sunlight inhibits the growth or survival of the tuberculosis bacteria. PTB screening showed a poor practice among the respondents in this study. This finding is consistent with the study by Junaid et al. (2021) where few respondents had ever been screened for pulmonary tuberculosis

Legal implication

In this study 88.3% have never gone for routine tuberculosis screening, even though the respondents showed average knowledge of tuberculous disease. This may be because Nigeria, like other countries of the world focuses on global best practices and does not have a policy that will compel individuals to go for PTB screening even though Screening is a core public health approach in the prevention and control of both communicable and

non-communicable diseases. A patient's right to the refusal of care is founded upon one of the basic ethical principles of medicine, autonomy. This principle states that every person has the right to make informed decisions about their healthcare and that healthcare professionals should not impose their own beliefs or decisions upon their patients or clients [16,17].

Identify the socio-demographic factors influencing pulmonary tuberculosis knowledge among respondents

The soci9o-demographic data used for this study include age, gender, occupation and income. The findings of this study showed that socio-demographic data influence pulmonary tuberculosis knowledge among young adults.

Firstly, age is a significant influence on the knowledge of pulmonary tuberculosis, this finding aligns with a study in the Western region of Saudi Arabia where individuals between 18-20 years were part of the factors associated with younger age[12]. The study points out the need for targeted educational intervention of pulmonary tuberculosis among young adults. This is also consistent with the findings where age, educational level and work experience were factors found to be significantly associated with knowledge[18].

The findings show that gender significantly influences pulmonary tuberculosis knowledge. This resonates with the result of a study among students of Cambodia, where the predictors of good knowledge were being female, studying in a health-related field and having a higher socioeconomic status[19]. Though, it is contrary to a study where the males were predictors of good knowledge of tuberculosis symptoms[20]. This also resonates with Luba et al. (2019) and Ogbeyi et al. (2020) where knowledge of tuberculosis had a significant difference between male and female respondents.

A study of predictors of tuberculosis knowledge, attitudes and practices among residents of urban slums in Lagos, Nigeria shows that the predictors of good knowledge were increasing age, post-secondary education and professional occupation[21.]. This is contrary to a study among final year medical students that had a good knowledge of pulmonary tuberculosis. The opposite outcome in Ali's work is based on the discipline of the respondents[22].

Lastly, income is shown to have a significant influence on knowledge, This finding aligns with the study where low income correlates with poor health knowledge, leading to increased tuberculosis incidence and adverse treatment effects. The findings also showed that patients from low socioeconomic backgrounds had a prevalence of adverse events during treatment, suggesting a link between income and health literacy regarding pulmonary tuberculosis[23].

CONCLUSION

This study assessed the level of knowledge and preventive practices against pulmonary tuberculosis among young adults in the selected churches. The findings of this study among this population showed that there is a need for educational intervention, especially on the socio-demographic factors that influence the knowledge of pulmonary tuberculosis. Even though the principle of autonomy has to be applied, nurses should advocate for routine screening and testing, especially in high-risk populations, to facilitate early detection and treatment. Health education and awareness campaigns in schools and worship centres could make the change to empower young adults on the various aspects or phases of the disease management, as well as their understanding of early detection of symptoms and appropriate care-seeking behaviours that would improve tuberculosis (PTB) prevention and control. Advanced laboratory study on BCG may need to be carried out to improve its potency with only one shot irrespective of storage temperature.

Author's statement

ACKNOWLEDGEMENTS

We acknowledge all the authors and churches whose articles/settings were used.

Ethical approval was obtained from the Ethical Committee of Rivers State Teaching Hospital, Port Harcourt, Rivers State, Nigeria (RSUTH/REC/2023332).

Funding: Not funded by any organization

Competing Interests: None

Author contribution: Contribution is by all authors

REFERENCES

1. Adepoju, V. A., Oladimeji, K. E., Adejumo, O. A., Adepoju, O. E., Adelekan, A., & Oladimeji, O. (2022). Knowledge of international standards for tuberculosis care among private non-NTP providers in Lagos, Nigeria: A cross-sectional study. Tropical Medicine and Infectious Disease, 7(8), 192. https://doi.org/10.3390/tropicalmed7080192
2. Alao, M. A., Maroushek, S. R., Chan, Y. H., Asinobi, A. O., Slusher, T. M., & Gbadero, D. A. (2020). Treatment outcomes of Nigerian patients with tuberculosis: A retrospective 25-year review in a regional medical center. PLOS ONE, 15(10), e0239225. https://doi.org/10.1371/journal.pone.0239225
3. Ali, H. (2020). Knowledge, attitude and practice regarding tuberculosis management among final year students of two medical colleges of Karachi. ResearchGate. https://www.researchgate.net/publication/339642707
4. Almalki, M. E., Almuqati, F. S., Alasmari, R., Enani, M. J., Bahwirith, A. A., Alloqmani, A. A., Alqurashi, A., & Hassan-Hussein, A. (2022). A cross-sectional study of tuberculosis knowledge, attitude, and practice among the general population in the western region of Saudi Arabia. Cureus. https://doi.org/10.7759/cureus.29987
5. Bagcchi, S. (2023). WHO's Global Tuberculosis Report 2022. The Lancet Microbe, 4(1), e20. https://doi.org/10.1016/S2666-5247(22)00359-7
6. Balogun, M. R., Sekoni, A. O., Meloni, S. T., Odukoya, O. O., Onajole, A. T., Longe-Peters, O. A., Ogunsola, F. T., & Kanki, P. J. (2019). Predictors of tuberculosis knowledge, attitudes and practices in urban slums in Nigeria: A cross-sectional study. The Pan African Medical Journal, 32. https://doi.org/10.11604/pamj.2019.32.60.14622
7. Baral, M. A., & Koirala, S. (2022). Knowledge and practice on prevention and control of tuberculosis among nurses working in a regional hospital, Nepal. Frontiers in Medicine, 8, 788833. https://doi.org/10.3389/fmed.2021.788833
8. Brett, K., Dulong, C., & Severn, M. (2020). Prevention of tuberculosis: A review of guidelines. Canadian Agency for Drugs and Technologies in Health. https://pubmed.ncbi.nlm.nih.gov/33048484/
9. Department of Economic and Social Affairs Sustainable Development. (2015). The 17 SDG goals. https://sdgs.un.org/goals
10. Guardian Nigeria News. (2023, March 24). World TB Day: Nigeria ranks sixth among high TB burden countries. https://guardian.ng/world-tb-day-nigeria-ranks-sixth-among-high-tb-burden-countries/
11. Imam, F., Sharma, M., Al-Harbi, N. O., Khan, M. R., Qamar, W., Iqbal, M., Ali, M. D., Ali, N., & Anwar, M. K. (2021). The possible impact of socioeconomic, income, and educational status on adverse effects of drugs and their therapeutic episodes in patients receiving tuberculosis interventions. Saudi Journal of Biological Sciences. https://doi.org/10.1016/j.sjbs.2021.02.004
12. Junaid, S. A., Kanma-Okafor, O. J., Olufunlayo, T. F., Odugbemi, B. A., & Ozoh, O. B. (2021). Tuberculosis stigma: Assessing knowledge, attitude and preventive practices in Surulere, Lagos, Nigeria. Annals of African Medicine, 20(3), 184–192. https://doi.org/10.4103/aam.aam_40_20
13. Ly, C., Yich, P., Thon, K., Pen, N., Thol, S., Nou, M., & Sokhun, C. (2023). Knowledge and attitude on tuberculosis among college students in Cambodia. Journal of Palembang Nursing Studies, 2(1), 30–41. https://doi.org/10.55048/jpns.v2i1.5
14. Madebo, M., Balta, B., & Daka, D. (2023). Knowledge, attitude and practice on prevention and control of pulmonary tuberculosis among index case families in Shebedino District, Sidama Region, Ethiopia. Heliyon, 9(10), e20565. https://doi.org/10.1016/j.heliyon.2023.e20565
15. Martinez, L., Cords, O., Liu, Q., Acuna-Villaorduna, C., Bonnet, M., Fox, G., Carvalho, A. C. C., Chan, P. C., Croda, J., Hill, P., Lopez-Varela, E., Donkor, S., Fielding, K., Graham, S., Espinal, M., Kampmann,

B., Reingold, A., Huerga, H., Villalba, J., … Andrews, J. (2022). Infant BCG vaccination and risk of pulmonary and extrapulmonary tuberculosis throughout the life course: A systematic review and individual participant data meta-analysis. The Lancet Global Health, 10(9), e1307–e1316. https://doi.org/10.1016/S2214-109X(22)00283-2

16. Ogbeyi, G. O., Chikaike, O., Saliu, I., & Ifedigbo, A. (2020). Factors in tuberculosis prevention among students of Benue State University Makurdi. Nigerian Hospital Journal. https://www.tnhjph.com/index.php/tnhj/article/view/482
17. Punch Newspaper. (2024, March 24). World TB Day 2024: Nigeria's tuberculosis scourge persists. https://punchng.com/world-tb-day-2024-nigerias-tuberculosis-scourge-persists/
18. Snow, K. J., Nelson, L. J., Sismanidis, C., Sawyer, S. M., & Graham, S. M. (2018). Incidence and prevalence of bacteriologically confirmed pulmonary tuberculosis among adolescents and young adults: A systematic review. Epidemiology & Infection, 146(8), 946–953. https://doi.org/10.1017/S0950268818000821
19. Snow, K. J., Cruz, A. T., Seddon, J. A., Ferrand, R. A., Chiang, S. S., Hughes, J. A., Kampmann, B., Graham, S. M., Dodd, P. J., Houben, R. M., Denholm, J. T., Sawyer, S. M., & Kranzer, K. (2020). Adolescent tuberculosis. The Lancet Child & Adolescent Health, 4(1), 68–79. https://doi.org/10.1016/S2352-4642(19)303
20. Taylan, M., Dogru, S., Sezgi, C., & Yilmaz, S. (2023). Epidemiological trends and seasonal dynamics of tuberculosis in Southeastern Turkey. Nigerian Journal of Clinical Practice, 26(7), 928–933. https://doi.org/10.4103/njcp_6292
21. Taylor, R. M. (2013). Ethical principles and concepts in medicine. In Handbook of Clinical Neurology (Vol. 118, pp. 1–9). Elsevier.
22. Wicks, E. (2001). The right to refuse medical treatment under the European Convention on Human Rights. Medical Law Review, 9(1), 17–40. https://doi.org/10.1093/medlaw/9.1.17
23. Wikurendra, E. A., Nurika, G., Tarigan, Y. G., & Kurnianto, A. A. (2021). Risk factors of pulmonary tuberculosis and countermeasures: A literature review. Open Access Macedonian Journal of Medical Sciences, 9(F), 549–555. https://doi.org/10.3889/oamjms.2021.7287
24. World Health Organization. (2023). Tuberculosis in the WHO African Region: 2023 progress update. https://www.who.int/publication/i/item/9789240061729