# Childhood Tuberculosis: Factors Influencing Knowledge and Case Detection Practice of Workers in Primary Health Care Settings in Osun State, Nigeria

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## Abstract

**Background:** Childhood tuberculosis is a major global public health problem and is responsible for a considerable burden of overall tuberculosis disease. It accounts for 6–10% of all tuberculosis cases worldwide. Primary health care workers are the first contact of the community to the healthcare delivery system and they attend to large populations in the community. Hence, this study assessed knowledge and case detection practices of childhood tuberculosis among these workers in Osun State.

**Methodology:** A descriptive cross–sectional study was conducted using multi-stage sampling technique to recruit 220 respondents. A semi – structured pretested self-administered questionnaire adapted from similar previous studies was used to collect data. Data were entered into IBM SPSS version 25 after correction for errors. Bivariate analysis was done using Chi-square and multivariate logistic regression was used to identify the predictors of knowledge and case detection practice at 5% level of significance.

**Result:** Forty seven (21.4%) respondents had good knowledge of childhood tuberculosis and 181 (82.3%) had good case detection practice. The predictor of good knowledge of childhood tuberculosis among respondents was previous participation in childhood tuberculosis training (AOR=7.919, $p < 0.001$) while predictors of good case detection practices among respondents were direct involvement in tuberculosis control (AOR=4.405, $p = 0.002$) and previous participation in childhood tuberculosis training (AOR=4.726, $p<0.014$).

**Conclusion:** The study highlights the poor knowledge of childhood

tuberculosis. Hence, specific trainings on childhood tuberculosis are urgently needed among PHC staff in Osun State, Nigeria.

**Keywords:** Case detection practice, Childhood tuberculosis, Knowledge

## Introduction

Tuberculosis (TB) is a contagious disease that is a major source of illness and one of the leading causes of mortality around the world. Tuberculosis infection is caused by *Mycobacterium tuberculosis,* which is a persistent slow-growing, non-motile, aerobic and highly contagious bacterium. It was the second leading cause of infectious disease death after the coronavirus (COVID-19) in 2021 and was the biggest cause of death from a single infectious agent until the advent of coronavirus (COVID-19).[1] Tuberculosis is transmitted through the air when patients with the disease exhale bacteria (e.g. by coughing, sneezing, talking etc.).

Approximately one-fourth of the world's population is infected with *M. tuberculosis*.[2] In 2021, an estimated 10.6 million new cases of tuberculosis were reported worldwide, with Africa accounting for 23% of these cases and having the second highest burden of tuberculosis after South East Asia (45%).1 Nigeria is the sixth country globally with high burden of Tuberculosis.[3] Globally, the estimated number of deaths from TB increased from 1.4 million to 1.6 million between 2019 and 2021.[1]

Tuberculosis affects all ages and childhood tuberculosis accounts for 6–11% of all tuberculosis cases worldwide. Unfortunately, there are no accurate data or exact estimates of childhood tuberculosis incidence, prevalence or death in most parts of the world because its epidemiology is poorly understood.[4] The World Health Organization (WHO) estimates that in high burden countries, about 40% of all TB cases are expected to occur in children.5 In 2014, 136 000 children aged 15 years and below died of tuberculosis, with over 40 000 of these fatalities occurring in Human Immunodeficiency Virus (HIV) - positive youngsters.[6]

Children, particularly those under the age of five are the most vulnerable because they are more likely to develop severe forms of the disease. At the same time there are particular difficulties in the diagnosis and management of childhood TB, reflected in the poor notification of cases.[7] Children's morbidity and mortality are affected by lack of access and delays in diagnosing and commencing adequate TB therapy which is dependent on knowledge of healthcare workers.[4] Studies have revealed that childhood TB detection practice among healthcare staff in Nigeria is inadequate, with their expertise having a substantial impact on their practices.

Tuberculosis is a disease of the poor and the overall objective of PHC is universal health coverage irrespectively of one's status. In order to achieve universal health coverage, which is key to achieving sustainable development goals, PHC workers' knowledge and skills are essential in meeting the set goals and target by 2035. Even though PHC workers are the closest to the community and they attend to a large number of patients, they constitute the weakest link in the chain of service delivery because of their relatively low knowledge and skills. Hence, this study assessed childhood tuberculosis knowledge and case detection practices of healthcare workers in PHC centres in Osun State, Nigeria.

## Methodology

**Study area:** the study was carried out in the Local Government Areas (LGAs) in Osun State.

**Study design:** A descriptive cross-sectional study design was used for the study.

**Study population:** consisted of nurses, public health officers, public health technicians, Community Health Extension Workers (CHEWs), Community Health Officers (CHOs), Junior Community Health Extension Workers (JCHEs), Laboratory Health workers, Health Assistants and Screening Officers. The inclusion criteria for this study were Primary Health Care workers with at least 6 months of work experience while casual or temporary staff were excluded from the study.

**Sample size determination:** Leslie fisher formula was used to calculate the sample size and based on previous similar study by Chukwu et al.8, proportion of respondents with good knowledge of childhood tuberculosis were 64.2% and sample size was adjusted based on estimated population of 832. The sample size arrived at was 247.

**Sampling technique:** A two-stage sampling technique was used to select respondents.

Stage1: Twenty (20) LGAs were selected out of the 30 LGAs in Osun State by simple random sampling technique with the aid of a table of random numbers. The selection was based on distribution of DOTS providers among facilities providing TB diagnostic and treatment services based on the comprehensive list shared by State programme manager

Stage 2: The list of all the registered PHCs offering DOTS services in these LGAs was obtained from Osun State Primary Health Care Development Board and 2 PHCs were selected per LGA by simple random sampling technique based on those with existing functional DOT facility making a total of 40 selected PHC centres. All the healthcare workers involved in tuberculosis diagnosis and treatment in the 40 selected PHCs were included in the study. Where the selected staff declined, the next staff was selected.

**Data collection instruments and data collection:** A pretested semi-structured validated self-administered questionnaire adapted from past similar studies[8,10] was used to collect information. The questionnaire consisted of three sections, namely socio-demographic characteristics of respondents, respondents' knowledge of childhood tuberculosis and respondents detection practice of childhood tuberculosis. Four undergraduate medical students were trained as research assistants for two hours.

**Scoring and grading of outcome variables:** the outcome variables were knowledge of respondents on childhood tuberculosis and case detection practices of respondents. Correct responses were scored 1 and incorrect responses were scored 0 for questions on both knowledge and case detection practice. The mean score of respondents' knowledge of tuberculosis was 15 ± 6. Respondent who scored below 15 were categorized as having poor knowledge while those who scored 15 or above were categorized as having good knowledge. The mean score for case detection practice was 6 ± 3. Respondents who scored below 6 were categorized as having poor case detection practices while those who scored 6 or above were categorized as having good case detection practices.

**Data management and analysis:** Data were analyzed using IBM Statistical Product and Service Solution (SPSS) version 25. Descriptive analysis of all the variables measured was first done and the categorical variables were reported as

frequencies and proportions. Associations between good knowledge and good case detection practices of childhood tuberculosis and other categorical variables were assessed using Chi square. A stepwise model binary logistic regression analysis was used to determine the predictors of good knowledge and good case detection practices of childhood tuberculosis using all the demographic variables as independent variables and knowledge and practice score as the outcome variables. All the significant variables during bivariate analysis were imputed into the logistic model. Adjusted odds ratio and 95% confidence interval were obtained to identify the predictors of good knowledge and good case detection practices of childhood tuberculosis among PHC workers in Osun State. The level of statistical significance was set at $p < 0.05$.

**Ethical consideration:** Ethical approval was obtained from Ethics Committee, College of Health Sciences UNIOSUN. Permission was obtained from Osun State PHCDA and heads of facilities where data were collected. Participants were fully informed that participation was completely voluntary and that they would not be penalized if they chose not to participate. All of the information gathered were kept confidential.

## Results

A total of 247 questionnaires were distributed and 220 correctly completed copies were returned giving a response rate of 89.1%.

**Socio-demographic characteristics of respondents:** There were 152 (69.1%) females among the respondents, 73 (33.2%) respondents were aged 39 years and above and the mean age of respondents was 33 ± 11years. Fifty eight (26.4%) of the respondents were Community Health Extension workers (CHEWs). Table 1.

**Knowledge of respondents on childhood tuberculosis:** One hundred and eleven (50.5%) respondents correctly defined childhood tuberculosis and 159 (72.3%) knew persistent cough as the commonest symptom of childhood tuberculosis. The risk to children that have household contact with sputum positive clients was identified by 94 (42.7%) of the respondents. The main mode of transmission identified was inhalation of aerosols containing TB nuclei by 47 (21.4%) respondents. Regarding the preventive measures, 201 (91.4%) respondents knew that there is a vaccine for the prevention of childhood tuberculosis. One hundred and forty nine (67.7%) knew Gene Xpert test as a means of confirming diagnosis. Bacteriological findings was the main classification identified for confirming TB by 143 (65.0%) respondents. Weight measurement; 131 (59.5%) was the main criterion for monitoring patients on treatment (Table 2). In categorizing the knowledge of respondents on childhood tuberculosis, Figure 1 shows that majority of the respondents; 173 (78.6%) had poor knowledge.

**Case detection practices of the respondents:** One hundred and forty (63.6%) of the respondents were directly involved in TB control but only about half of them; 58 (51.4%) were involved in identification of presumptive cases. One hundred and three (46.8%) of the respondents had participated in TB training in the past but 52 (50.5%) of them had the training more than 5 years earlier. Case detection rate of respondents reveals that majority of the respondents; 186 (84.5%) used national TB guidelines when on duty, 109 (58.6%) of whom used it every time. Among respondents that didn't use national guidelines, 16 (47.1%) respondents' reason for not using it was that they were not TB Directly Observed Therapy (DOT) officers. Also, majority of

the respondents; 190 (86.4%) used WHO score chart for screening childhood TB and 110 (57.9%) of them used it every time. Among respondents that did not use WHO score chart for screening, 17 (56.7%) respondents' reason for non-use was because they were not DOT officers. Majority; 166 (75.5%), had IEC materials and drugs for childhood tuberculosis that aid childhood tuberculosis detection and treatment. Gene Xpert machine was also available in 84 (38.2%) facilities. (Table 3). Figure 2 shows that majority of the respondents; 181 (82.3%) had good case detection practice.

**Factors associated with good knowledge of childhood tuberculosis among respondents:** Table 4 shows that 12(57.1%) of public health officers had good knowledge of childhood tuberculosis. There was a statistically significant association between respondents' cadre and knowledge of childhood tuberculosis (p=0.004). One hundred and two respondents (72.9%) who were directly involved in TB control had good knowledge of childhood tuberculosis. Similarly, direct involvement in TB control was associated with good childhood TB knowledge (p=0.009). Also 65 respondents (63.1%) who had previously participated in TB training had good knowledge of childhood tuberculosis with a statistically significant association between previous TB training and knowledge of childhood TB (p<0.001).

**Factors associated with respondents' good case detection practice of childhood tuberculosis:** From Table 5, Job cadre (p = 0.012) and direct involvement in TB control (p = 0.001) had statistically significant association with case detection practices. In addition, 99 (96.1%) respondents who had previously participated in TB training had good case detection practices of childhood tuberculosis. There was a statistically significant relationship between participation in in TB training and performance at case detection (p =0.001)

**Predictors of good knowledge of childhood tuberculosis among respondents:** Respondents who had previously participated in childhood tuberculosis training were 7.919 times (AOR=7.919, C.I 2.756 – 22.753) more likely to have good knowledge compared to those that had not participated in the training (p<0.001). Table 6.

**Predictors of good case detection practices of childhood tuberculosis among respondents:** Table 7 shows that respondents who were directly involved in TB control were 4.405 times (AOR=4.405, C.I = 1.742 – 11.142) more likely to have good case detection practice compared to those who were not directly involved in TB control (p = 0.002). Respondents who had previously participated in childhood tuberculosis training were 4.726 times (AOR=4.726, C.I 1.377 – 16.224) more likely to have good case detection practice compared to those that had not participated in the training (p<0.014).

**TABLE 1: Socio – demographic characteristics of respondents (n = 220)**

| Variable | Frequency | Percentage |
|---|---|---|
| **Age group** | | |
| 18-24 years | 69 | 31.4 |
| 25-31 years | 43 | 19.5 |
| 32-38 years | 35 | 15.9 |
| = 39 years | 73 | 33.2 |
| **Mean ±SD=33 ± 11** | | |
| **Gender** | | |
| Male | 68 | 30.9 |
| Female | 152 | 69.1 |
| **Highest level of education** | | |
| Secondary education | 11 | 5.0 |
| Tertiary education | 209 | 95.0 |
| **Designation of Job/Cadre** | | |
| Public Health officer | 21 | 9.5 |
| Public health technician | 35 | 15.9 |
| CHEW | 58 | 26.5 |
| CHO | 9 | 4.1 |
| JCHEW | 6 | 2.7 |
| Health Assistant | 19 | 8.6 |
| Laboratory Health worker | 17 | 7.7 |
| TB Screening officer | 25 | 11.4 |
| Nurse | 30 | 13.6 |

**Table 2: Respondents' knowledge on childhood tuberculosis (multiple responses allowed)**

| Variable | Correct answer (%) | Incorrect answer (%) |
|---|---|---|
| **Description of childhood TB** | 111 (50.5) | 109(49.5) |
| **Commonest symptoms of childhood TB** | | |
| Persistent cough > 2weeks | 159 (72.3) | 61 (27.7) |
| Weight loss | 60 (27.3) | 160 (72.7) |
| Prolonged fever | 49 (22.3) | 171 (77.7) |
| Failure to thrive | 59 (26.8) | 161 (73.2) |
| Others[1] | 14 (6.4) | 206 (93.6) |
| **Risk of childhood tuberculosis** | | |
| Children that have household contact with smear positive clients | 94 (42.7) | 126 (57.3) |
| Children <5 years | 76 (34.5) | 144 (65.5) |
| HIV+ children | 73 (33.2) | 147 (66.8) |
| Severely malnourished | 44 (20.0) | 176 (80.0) |
| Others[2] | 16 (7.3) | 204 (92.7) |
| **Mode of transmission** | | |
| Contact with respiratory droplets on surfaces | 0 (0.0) | 220 (100.0) |
| Inhalation of aerosols | 47 (21.4) | 173 (78.6) |
| Taking contaminated cow milk | 44 (20.0) | 176 (80.0) |
| Breast milk of infected mothers | 31 (14.1) | 189 (85.9) |
| Others | 8 (3.6) | 212 (96.4) |
| **Preventive measures** | | |
| Vaccine for the prevention of childhood TB | 201 (91.4) | 19 (8.6) |
| Vaccine type | 181 (90.0) | 20 (10.0) |
| Contact tracing is applicable to children living with | | |
| Sputum+ TB patients | 91 (41.4) | 129 (58.6) |
| HIV+ patients | 63 (28.6) | 157 (71.4) |
| Patients with symptoms of presumptive TB | 73 (33.2) | 147 (66.8) |
| Index cases of MDR-TB or XDR-TB | 50 (22.7) | 170 (77.3) |
| Only children without symptoms of TB living with | 110 (50.0) | 110 (50.0) |
| Smear positive patients are eligible for IPT | | |
| **Confirmation of TB** | | |
| Symptoms only | 23 (10.5) | 197 (89.5) |
| GeneXpert test using sputum and stool specimen | 149 (67.7) | 71 (32.3) |
| **Classification of confirmed cases of TB** | | |
| Site of disease | 33 (15.0) | 187 (85.0) |
| Bacteriological findings | 143 (65.0) | 77 (35.0) |
| Previous anti-TB drug intake | 43 (19.5) | 177 (80.5) |
| HIV status | 20 (9.1) | 200 (90.9) |
| Others[3] | 4 (1.8) | 216 (98.2) |
| **Criteria for monitoring patients on treatment** | | |
| Weight | 131 (59.5) | 89 (40.5) |
| Drug intake | 61 (27.7) | 159 (72.3) |
| Bacteriological findings | 88 (40.0) | 132 (60.0) |
| Drugs used in management | 71 (32.3) | 149 (67.7) |
| Differences between treatment completed, cured and relapsed | 67 (30.5) | 153 (69.5) |

Others[1]=decreased appetite, fatigue and swollen lymph nodes others[2]= children with immunocompromized conditions and living in poorly ventilated house others[3]= drug resistance and clinical presentation

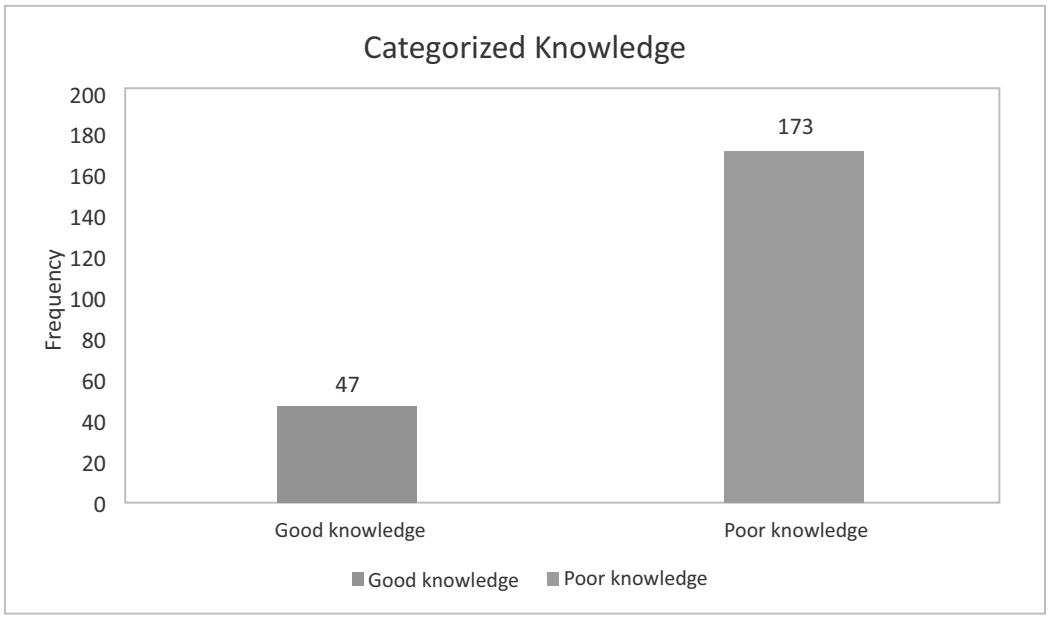


**Fig.1: Categorized knowledge of respondents on childhood tuberculosis**

**Table 3: Factors associated with childhood tuberculosis case detection practices among respondents**

| Variable | Frequency | Percentage |
|---|---|---|
| **Directly involved in TB control** | | |
| Yes | 140 | 63.6 |
| No | 80 | 36.4 |
| **Activities involved in during TB control** | | |
| Identification of presumptive cases | 72 | 51.4 |
| Confirmation of diagnosis | 58 | 41.4 |
| Commencement of treatment | 54 | 38.6 |
| Follow up | 31 | 22.1 |
| Contact tracing | 26 | 18.6 |
| Others[1] | 13 | 9.3 |
| **Prior participation in TB training** | | |
| Yes | 103 | 46.8 |
| No | 117 | 53.2 |
| **Participation in TB training (years ago)** | | |
| 1-2 years | 34 | 33.0 |
| 3-5 years | 17 | 16.5 |
| >5 years | 52 | 50.5 |
| **Usage of national TB guidelines** | | |
| Yes | 186 | 84.5 |
| No | 34 | 15.5 |
| **Frequency of national TB guideline usage** | | |
| Every time | 109 | 58.6 |
| Sometimes | 47 | 25.3 |
| Occasionally | 30 | 16.1 |

| | | |
|---|---|---|
| **Reasons for not using national TB guideline** | | |
| Not well trained | 4 | 11.8 |
| I'm not a DOT officer | 16 | 47.1 |
| No response | 14 | 41.1 |
| **Usage of WHO Score chart for screening childhood TB** | | |
| Yes | 190 | 86.4 |
| No | 30 | 13.6 |
| **Frequency of its usage** | | |
| Every time | 110 | 57.9 |
| Sometimes | 49 | 25.8 |
| Occasionally | 31 | 16.3 |
| **Reasons for not using WHO Score chart** | | |
| Not available | 4 | 13.3 |
| Not a DOT officer | 17 | 56.7 |
| No response | 9 | 30.0 |
| **Availability of IEC materials on childhood TB in your facility** | | |
| Yes | 166 | 75.5 |
| No | 54 | 24.5 |
| **Availability of Gene Xpert machine in your facility** | | |
| Yes | 84 | 38.2 |
| No | 136 | 61.8 |
| **Availability of drugs for childhood TB treatment** | | |
| Yes | 180 | 81.8 |
| No | 40 | 18.2 |

Others[1]= awareness and giving health education


**Fig.2: Case detection practices of respondents on childhood tuberculosis**

**Table 4: Factors associated with knowledge on childhood tuberculosis**

| Variable | Categorized knowledge (%) | | Statistics |
|---|---|---|---|
| | Poor Knowledge | Good knowledge | |
| **Age group(years)** | | | |
| 18-24 years | 57 (82.6) | 12 (17.4) | $x^2$=1.186 |
| 25-31 years | 34 (79.1) | 9 (20.9) | p=0.756 |
| 32-38 years | 27 (77.1) | 8 (22.9) | |
| = 39 years | 55 (75.3) | 18 (24.7) | |
| **Gender** | | | |
| Male | 50 (73.5) | 18 (26.5) | $x^2$= 1.528 |
| Female | 123 (80.9) | 29 (19.1) | p=0.216 |
| **Level of education** | | | |
| Lower education | 9 (81.8) | 2 (18.2) | $x^2$=0.00 |
| Higher education | 164 (78.9) | 45 (21.5) | p=1.000 |
| **Designation /Job cadre** | | | |
| PHO | 9 (42.9) | 12 (57.1) | $x^2$=22.805 |
| PHT | 31 (88.6) | 4 (11.4) | **p=0.004** |
| CHEW | 49 (84.5) | 9 (15.5) | |
| CHO | 8 (88.9) | 1 (11.1) | |
| JCHEW | 5 (83.3) | 1 (16.7) | |
| Health Assistants | 12 (63.2) | 7 (36.8) | |
| Laboratory Health worker | 12 (70.6) | 5 (29.4) | |
| Screening officer | 20 (80.0) | 5 (20.0) | |
| Nurse | 27 (90.0) | 3 (10.0) | |
| **Directly involved in TB control** | | | |
| Yes | 38 (27.1) | 102 (72.9) | $x^2$=7.654 |
| No | 71 (88.8) | 9 (11.2) | **p=0.009** |
| **Prior participation in TB training** | | | |
| Yes | 38 (36.9) | 65 (63.1) | $x^2$=27.803 |
| No | 108 (92.3) | 9 (7.7) | **p<0.001** |
| **Participation in TB training (years ago)** | | | |
| 1-2 | 25 (73.0) | 9 (26.5) | |
| 3-5 | 7 (41.2) | 10 (58.8) | $x^2$=5.023 |
| >5 | 33 (63.5) | 19 (36.5) | p=0.081 |

PHO=public health officer, PHT = public health technician, CHO=community health officer, CHEW=Community health extenson worker, JCHEW=Junior community health extension worker

**Table 5:** Factors a**ssociated with case detection practice of childhood tuberculosis**

| Variable | Categorized practice (%) | | Statistics |
|---|---|---|---|
| | Poor practice | Good practice | |
| **Age group (years)** | | | |
| 18-24 years | 15 (21.7) | 54 (78.3) | $x^2$=5.629 |
| 25-31 years | 11 (25.6) | 32 (74.4) | p=0.131 |
| 21-38 years | 3 (8.6) | 32 (91.4) | |
| = 39 years | 10 (13.7) | 63 (86.3) | |
| **Gender** | | | |
| Male | 9 (13.2) | 59 (86.8) | $x^2$= 0.952 |
| Female | 30 (19.7) | 122 (80.3) | p=0.329 |
| **Level of education** | | | |
| Lower education | 0 (0.0) | 11 (100.0) | $x^2$=1.380 |
| Higher education | 39 (18.7) | 170 (81.3) | p=0.240 |
| **Designation/job cadre** | | | |
| PHO | 3 (14.3) | 18 (85.7) | $x^2$=19.496 |
| PHT | 4 (11.4) | 31 (88.6) | **p=0.012** |
| CHEW | 14 (24.1) | 44 (75.9) | |
| CHO | 4 (44.4) | 5 (55.6) | |
| JCHEW | 1 (16.7) | 5 (83.3) | |
| Health Assistance | 5 (26.3) | 14 (73.7) | |
| Laboratory Health worker | 1 (5.9) | 16 (94.1) | |
| TB Screening officer | 0 (0.0) | 25 (100.0) | |
| Nurse | 7 (23.3) | 23 (76.7) | |
| **Directly involved in TB control** | | | |
| Yes | 9 (6.4) | 131 (93.6) | $x^2$=33.699 |
| No | 30 (37.5) | 50 (62.5) | **p<0.001** |
| **Prior participation in TB training** | | | |
| Yes | 4 (3.9) | 99 (96.1) | $x^2$=25.450 |
| No | 35 (29.9) | 82 (70.1) | **p<0.001** |
| **Participation in TB training (years ago)** | | | |
| 1-2 | 0 (0.0) | 34 (100.0) | $x^2$=3.284 |
| 3-5 | 1 (5.9) | 16 (94.1) | p=0.194 |
| >5 | 3 (5.8) | 49 (94.2) | |

PHO=public health officer, PHT = public health technician, CHO=community health officer, CHEW=Community health extenson worker, JCHEW=Junior community health extension worker

**Table 6: Predictors of good knowledge of childhood tuberculosis**

| Variable | COR | AOR | p-value | Confidence interval | |
|---|---|---|---|---|---|
| | | | | Lower | Upper |
| **Qualification** | | | | | |
| Public Health | 1.514 | 1.704 | 0.176 | 0.788 | 3.686 |
| Nurse | 0.421 | 0.991 | 0.989 | 0.249 | 3.939 |
| Other cadres (Reference value ) | | | | | |
| **Directly involved in TB Control** | | | | | |
| Yes | 2.939 | 0.809 | 0.698 | 0.277 | 2.360 |
| No (Reference value) | | | | | |
| **Prior participation in TB training** | | | | | |
| Yes | 0.143 | 7.919 | **<0.001** | 2.756 | 22.753 |
| No (Reference value) | | | | | |

COR – Crude Odds ratio, AOR – Adjusted Odds ratio

**Table 7: Predictors of good case detection practices among respondents**

| Variable | COR | AOR | p-value | Confidence interval | |
|---|---|---|---|---|---|
| | | | | Lower | Upper |
| **Qualification** | | | | | |
| Public Health expert | 1.606 | 1.962 | 0.181 | 0.731 | 5.267 |
| Nurse | 0.754 | 1.226 | 0.703 | 0.430 | 3.493 |
| Other cadres (Reference value) | | | | | |
| **Directly involved in TB Control** | | | | | |
| Yes | 8.733 | 4.405 | **0.002** | 1.742 | 11.142 |
| No (Reference value) | | | | | |
| **Prior participation in TB training** | | | | | |
| Yes | 10.564 | 4.726 | **0.014** | 1.377 | 16.224 |
| No (Reference value) | | | | | |

COR – Crude Odds ratio, AOR – Adjusted Odds ratio

## Discussion

About four – fifth of the respondents had poor knowledge of childhood tuberculosis. This was similar to findings from a study conducted by Noé et al. in southern Mozambique in which most of the respondents had poor knowledge.[11] Another study in Cameroon had a contrary finding in which less than half of the respondents had poor knowledge. This may not be surprising because about two-thirds of their respondents in that study were medical doctors and nurses[12] and this cadre of staff are expected to have better knowledge. Also a study by Chukwu et.al shows that majority of respondents had good knowledge of childhood tuberculosis.[8] High knowledge in this study is likely due to the fact that all levels of healthcare delivery (Primary, Secondary and Tertiary) were involved and most of the respondents with good

knowledge were in tertiary healthcare centres, where continuous training often takes place. Hence, there is need to ensure more training and retraining for healthcare workers at all levels of healthcare delivery especially at PHC.

More than two – third of the respondents identified persistent cough as commonest symptom of childhood tuberculosis and a similar finding was also documented in Cameroon.[12] Also, sputum was identified as specimen needed for diagnosis by two – third of the respondents and this was also similar to a previous study in which about half of the respondents likewise identified it.[12] Identification of this symptom will help in making appropriate diagnosis.

The main method identified for confirmation of diagnosis was Gene xpert in about two – third of the respondents. This was more than what a previous study found where less than half of respondents recognized it as the molecular test for the diagnosis of TB.[9] The observed difference may not be surprising because there were limited Gene xpert machines in those locations where the study was conducted. The poor knowledge observed in this study may be due to the fact that less than half of the respondents had had training in TB control and more than half of them had the training more than five years preceding the study. Limited knowledge was observed in a similar study in which insufficient training was also observed in about two – third of the respondents.[9] Also, the poor knowledge of childhood TB may be due to varying presentation of childhood TB and specific presentation features still unclear. This discovery of poor knowledge will assist physicians and stakeholders in TB management to redirect their intervention programs towards scaling up childhood TB knowledge among PHC staff. This is essential because PHC staff are at grassroots and will have more contacts with community members.

About four out of five respondents used national TB guidelines for management but less than half of them used it always. This finding might be one of the reasons why case detection practice was good in four out of five respondents. This finding was similar to the finding of a study by Vukugah and colleagues in which about half used national TB guideline for their management always and good case detection practice was documented in about three out of five respondents.[12] Another study by Chukwu et.al showed good case detection practice in less than one in ten respondents and less than half of the respondents used national guidelines for the management of childhood TB. Likewise a study in Saudi Arabia showed good case detection practice in only a third of the respondents.[13] Good case detection practice of childhood tuberculosis will make diagnosis easy and prevent spread of the disease since there are many other infections during childhood that can present like tuberculosis.

In this study, direct involvement in TB management and previous participation in TB training were significantly associated with good knowledge of childhood TB. A similar study by Joshi et.al identified direct involvement in childhood TB management as factor associated with good knowledge[9] and another study by Vukugah et. al also identified training on childhood tuberculosis as factor influencing knowledge.[12] This finding is not a surprise because training is expected to increase knowledge on childhood tuberculosis. This finding highlights the importance of providing HCWs with training opportunities ( e.g refresher training, regular in-service training programs by external institutions, etc) on childhood TB. Likewise in this study, tuberculosis screening officers, direct involvement in TB control and previous participation in TB training were significantly associated

with good case detection practices of childhood tuberculosis. Similar findings were observed in a study conducted in Saudi Arabia in which training on childhood tuberculosis and medical doctors were associated with good TB management.[13] The emphasis in the Saudi Arabian study was on tuberculosis management while this study was on case detection practice and medical doctors were expected to be involved in management while tuberculosis screening officers often involved in case detection practices.

In the multivariate analysis, the results of this study showed that participation in TB training was the predictor of good knowledge of childhood tuberculosis. Respondents who had previously participated in childhood tuberculosis training were more likely to have good knowledge compared to those that had not participated in the training. This is not a surprise because training is expected to lead to more knowledge. A similar finding was observed by vukugah et.al study.[12] Also, respondents who were directly involved in TB control were more likely to have good case detection practice compared to those who were not directly involved in TB control. This finding is expected because practice is meant to bring about perfection. Hence, specialization in chosen field should be encouraged for better case detection practice.

**Conclusion and recommendations**

The poor knowledge of childhood tuberculosis among healthcare workers in PHC settings connotes an important issue that needs to be addressed appropriately in other to bring about reduction in childhood tuberculosis. Training and retraining of workers at PHC on childhood tuberculosis will enhance good knowledge.

The good case detection practice observed in this study was seen to be associated with training and direct involvement in childhood tuberculosis management. Training and more involvement of all cadres of staff should be encouraged to promote even better case detection practices. Government and stakeholders' involvement is urgently required most especially among healthcare workers at PHC centres in Osun State, Nigeria.

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