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Afr. J. Biomed. Res. Vol. 27 (May 2024); 287- 294

Research Article

Knowledge, Attitude and Practice of Primary Health Care Providers on Children Tuberculosis Control in Ibadan, Nigeria

Brown V.B., Elemese P.O.

School of Nursing, University College Hospital, Ibadan. Oyo State, Nigeria

ABSTRACT

Nigeria is one of the 30 high tuberculosis burden countries globally. Childhood tuberculosis has been identified as a hidden epidemic with a large proportion of the cases remaining undetected. For many years, tuberculosis control programmes have focused on adults, programmes and studies specific to childhood tuberculosis should be prioritized. Healthcare providers are frontline workers fighting against tuberculosis, their knowledge, attitude, and practices are essential to tuberculosis control. This study assessed knowledge, attitude and practice on prevention and control of childhood tuberculosis in selected primary health care (PHC) centres in three Local Government Areas (LGAs) in Ibadan, southwestern Nigeria. A cross-sectional design was employed in the study. A total of 270 participants were selected using multistage sampling technique. A semi-structured questionnaire was used to collect data which were analysed and presented in percentages. Association between variables were tested with chi-square and Fisher's exact test at 0.05 level of significance. Overall, 215 (79.65) of the participants were female, 125 (46.3%) were nurses/midwives, only 27 (10%) ever attended a training on tuberculosis in the preceding 12 months. Sixty-nine (25.6%) had good knowledge, 46 (17%) had positive attitude, while 74 (27.4%) had good practice of childhood tuberculosis prevention and control. Good knowledge was found to have significant association with good practice among the participants ($P=0.000$). The study revealed poor knowledge, attitude and practice towards childhood tuberculosis prevention and control among PHC providers in selected centres in Ibadan, Nigeria. Training and re-training of PHC providers on tuberculosis is recommended at grassroot level.

Keywords: *Health Providers, Knowledge, Attitude, Practice, Children, Tuberculosis Control.*

*Author for correspondence: Email: vicbrown2010@gmail.com; Tel: +234-8037272857

Received: February 2024; Accepted: April 2024

DOI: <https://doi.org/10.4314/ajbr.v27i2.12>

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INTRODUCTION

Tuberculosis (TB) is a communicable disease that is a major cause of ill health and one of the leading causes of death worldwide (World health organization (WHO, 2021). In 2020, 87% of new TB cases occurred in the 30 high TB burden countries. Eight countries: India, Indonesia, China, the Philippines, Pakistan, Nigeria, Bangladesh and the Democratic Republic of the Congo accounted for more than two thirds of the global total (WHO, 2022).

The COVID-19 pandemic has impacted negatively on access to TB diagnosis and treatment and the burden of TB disease. WHO report showed that progress made in the years up to 2019 has slowed, stalled or reversed, and global TB targets have been drifted (WHO, 2022). There has been a large global drop in the reported number of people newly diagnosed

with TB. From a peak of 7.1 million in 2019, this fell to 5.8 million in 2020 (-18%), back to the level last seen in 2012 (WHO 2022).

Despite different efforts to combat TB in Nigeria, the country was identified in 2020 as first in Africa and sixth among the 30 high TB burden countries in the world (WHO, 2021). The estimated burden of TB was 440,000 cases; of these, only 117,320 (27 percent) were diagnosed and notified to the National Tuberculosis Programme (NTP). Among the notified cases of TB, 35 percent were women, 57 percent were men, and eight percent were children (WHO 2020). There are several challenges affecting the success of strategies to control TB in Nigeria, one of the challenges being inadequate human resources technical capacity (Ogbuabor and Onwujekwe, 2019).

Global estimates of TB incidence in 2019 showed 12% in children (WHO 2020). Eighty percent of child TB deaths occur in under-five children (WHO 2018). Although TB is curable and preventable, child and adolescent TB is often overlooked by health providers and can be difficult to diagnose and treat (WHO 2022).

Childhood TB has been identified as a hidden epidemic with a large proportion of the cases remaining undetected, and for many years, TB control programs have focused on adults (Camirero and Scardigli, 2016). According to WHO (2020), estimation of the burden of TB disease in children is a challenge because of inconsistent quality of notification data for children, particularly in high TB burden countries. Inventory studies specific to childhood TB would help to improve the quality of TB disease burden estimates for children and should be prioritized (WHO 2020). The roadmap towards ending TB in children and adolescents, launched by WHO in collaboration with the United Nations (UN) on TB in 2018, provides an agenda for scaling up interventions for children (<10 years) and adolescents (10–19 years) (WHO 2020).

Primary Health Care (PHC) is the foundation of the health system in Nigeria and is the first point of contact within the health care system. In Nigeria, PHC health providers are Medical Officers, Nurse/Midwives, Public Health Nurses, Public Health Nutritionists, Community Health Officers (CHOs), Community Health Extension Workers (CHEWs), Junior Community Health Extension Workers (JCHEWs), Health Technicians, Pharmacy technicians, Health Assistants, Environmental Health Officers Laboratory technicians and Medical Record Officers (National Primary Health Care Development Agency (NPHCDA, 2012) . Meanwhile, PHC providers are essential in the prevention and control of TB (WHO 2004).

Health care providers are frontline workers fighting against TB (Klinton *et al.* 2023). The knowledge, attitude, and practices (KAP) of health care providers' are essential to TB case detection and treatment (Yadav *et al.* 2017), Noé *et al.* 2017), WHO, 2018). Few studies have examined the level of knowledge and practice of PHC providers on prevention and control of TB in children in Ibadan, Nigeria. Therefore, this study assessed knowledge, attitude and practice on prevention and control of childhood tuberculosis in selected primary health care centres in selected Local Government Areas (LGA) in Ibadan, southwestern Nigeria. It is hoped that the findings of this study may provide information on the capacity of health care providers on management of tuberculosis in children thereby guiding necessary interventions to improve the prevention and control of tuberculosis among children and adolescents.

MATERIALS AND METHODS

Study Design: The study design was a quantitative, descriptive cross-sectional health-facility-based survey..

Study Setting: The study setting was Ibadan, Oyo state, Southwest Nigeria.

Study Population: The study was conducted among PHC providers in three LGAs in Ibadan Oyo state.

Sampling: Ibadan has eleven Local Government areas (LGAs). Utilizing multistage sampling technique, three LGAs, Ibadan North-East, Ibadan North and Akinyele LGAs were randomly selected using ballot system. Ibadan North-East, Akinyele and Ibadan North LGAs have 22, 27 and 18 PHC centres respectively. The lists of all the PHC centres in each of the three LGAs were generated, 18 PHC centres were randomly selected from all the three LGAs. Then, a purposive sampling technique was used for selecting eligible health care providers in each primary health care centre. Participants in the study were 270 primary health care providers from 18 PHC centers in the three randomly selected Local Government Areas in Ibadan, Oyo state, Nigeria.

Sample Size Determination: The sample size for the study was computed from the proportion formula

$$n = \frac{Z^2 \times P(1-P)}{C2} \quad (\text{Lwanga and Lemeshow 1991})$$

Inclusion Criteria: The eligibility criteria for participating in the study were being a health care worker that is directly involved in the diagnosis and care of TB cases in selected PHC centres (that is a doctor, a nurse, a midwife, a public health nurse a Community Health Officer (CHO), Community Health Extension Workers (CHEWs) or Laboratory Technician; having worked for at least six months in any of the PHC centers, and giving consent to participate in the study.

Ethical Consideration: Ethical approval for the study was obtained from the University of Ibadan/University College Hospital Ibadan Ethics Committee (Approval Number: UI/EC/20/0482). Written informed consent was obtained from all the respondents who voluntarily participated in the study.

Instrument for Data Collection: A self-administered semi-structured questionnaire was used as an instrument to collect data. The questionnaire was developed in English after a thorough literature review. It had 73 question items and was divided into four sections. Section A contained eight questions on socio-demographic characteristics of the participants, section B contained 34 items for assessing the participants' knowledge about prevention, treatment and control of childhood tuberculosis. Section C contained 18 items used to examine the participants' practice of prevention, treatment and control of childhood tuberculosis, while section D had 13 items used to explore the participants' attitude towards the prevention, treatment and control of childhood tuberculosis. For the question items used for assessing the participants' knowledge and practice about prevention, and control of childhood tuberculosis, the respondents were requested to fill-in the gaps provided or circle the correct answer for some of the items. The responses were marked by the researchers using a marking guide. For the 34 items used to assess knowledge, correct response to each knowledge question was scored 2, while the wrong response was scored 0. The scores were computed to generate a total knowledge score of minimum of 0 and maximum of 68. The overall score was dichotomized

into good and poor knowledge using 60% of 68 as a cut-off value (approximately 41). Those who scored 41 (60%) and above were regarded as having good overall knowledge of TB in children, and those who scored below 41 (60%) were categorized as having poor overall knowledge of TB in children.

Regarding the attitude of the participants, 13 items were used to explore the participants' attitude towards prevention and control of TB in children. Five points Likert scale was used to assess how a participant agreed with each attitude statement ranging from 5 (Strongly agree) to 0 (Neutral). Some items were worded in the positive direction (so that agreement to such items represents a positive attitude), while some items were worded in the negative direction (so that disagreement to such items represents a positive attitude). The attitude statements were then grouped and recoded. Each positive attitude response was scored 2, while negative attitude response was scored 0. The scores were computed to generate a total attitude score of maximum 26 and minimum 0. The overall score was dichotomized into positive and negative attitude using 60% of 26 as a cut -off value (approximately 16) Those who scored 16 (60%) and above were considered to have positive attitude, while those who scored below 16 (60%) were considered to have negative attitude towards the prevention and control of childhood tuberculosis.

Eighteen (18) items were used for assessing the participants' reported practice about prevention, and control of childhood tuberculosis. Each correct point was awarded 2 and incorrect point was awarded 0. The scores were computed to generate a total practice score of minimum of 0 and maximum of 36. The overall score was dichotomized into good and poor practice using 60% of 36 (approximately 22) as a cut-off value. Those who scored 22 and above were regarded as having good practice of TB in children, and those who scored below 22 were categorized as having poor practice of TB in children.

Validity and Reliability of the Instrument: To ensure content and face validity, the questionnaire was developed after thorough literature review. The questionnaire was then reviewed by experts for completeness and appropriateness to ensure validity. The questionnaire was pre-tested on 27 participants (10% of sample size) who were excluded later from the study sample.

Data Collection Procedure: Two hundred and seventy-two self-administered questionnaires were responded to by the participants over four weeks period. The duration for each participant to completely fill the questionnaire was about 15 minutes.

Data Management and Analysis: All completed copies of questionnaire were retrieved, checked for correctness and completeness. The copies of the questionnaire were then manually sorted out before the data were entered into the computer. Data entry and analysis were carried out using the IBM SPSS Statistics 22.0 (IBM Corporation, Armonk, NY). Descriptive analysis was done to summarize the data, frequencies and percentages were reported for categorical data

and measure of central tendency (mean/median and dispersion (standard deviation) for quantitative data. Summary statistics were presented using tables and figures. Bivariate analysis was done using Chi-square/Fishers exact test at 0.05 level of significance to assess associations between categorical variables.

RESULTS

Two hundred and seventy (270) of the 272 questionnaires administered were retrieved, giving the response rate of 99.3%. The ages of the 270 PHC health providers who participated in the study ranged from 21 to 60 years with a mean (SD) age of 39 (SD 9.1) years. Other socio-demographic characteristics of the participants in the study are presented in Table 1.

Table 1:
Socio-demographic Characteristics of the Participants

Socio-demographic Characteristics	Frequency (N=270)	Percentage	
Age (in Years)	<25	12	4.4
	25-34	87	32.2
	35-44	82	30.4
	45-54	75	27.8
	55 and above	14	5.2
Sex	Female	215	79.6
	Male	55	20.4
Tribe	Yoruba	230	85.2
	Hausa	3	1.1
	Ibo	11	4.1
	Other tribe	26	9.6
Religion	Christianity	219	81.1
	Islam	50	18.5
	Traditional	1	0.4
Job category	Medical Officer	32	11.9
	Nurse/Midwife	125	46.3
	Community Health Officer (CHO)	39	14.4
	Community Health Extension Worker (CHEW)	36	13.3
	Junior Community Health Extension Workers (JCHEW)	32	11.9
	Laboratory Technician	6	2.2
Level of education	Ordinary National Diploma (OND)	85	31.5
	Higher National Diploma (HND)	51	18.9
	University Graduate	119	44.1
	Post graduate	15	5.6
Years of experience at PHC Level	≤5	141	52.2
	6-10	46	17.0
	11-15	16	5.9
	16-20	20	7.4
	21- 25	26	9.6
>25	21	7.8	

One hundred and forty-two (53%) of the PHC health providers had ever been trained on prevention, and control of tuberculosis. Only 27 (10%) of the participants indicated to have attended a training on TB in the preceding 12 months, 15 (55.6%) of the 27 participants indicated they attended the

training organized by Damien Foundation, Belgium, six (22.2%) received training organized by WHO, three (11.1%) had TB training from their basic training school. The remaining three (11.1%) attended a training organized by the Institute of Human Virology Nigeria and ‘Breakthrough Action’

Participants’ Knowledge on Tuberculosis Prevention and Control in Children: Table 2 shows some of the answers the participants provided on knowledge questions about TB in children. Two hundred and forty three (90%) of the participants correctly mentioned that tuberculosis is a communicable disease, 231 (85.6%) mentioned bacteria as the cause of tuberculosis. However, only 4 (1.5%) mentioned DOTS (Directly Observed Treatment, Short-course) as the proven and cost-effective TB treatment strategy. Other variables used to assess the participants knowledge are shown in table 2.

Table 2:
Participants’ Knowledge on Tuberculosis in Children

Variables	Frequency	%
How can TB in children be diagnosed?		
Chest X-ray	21	7.8
Physical examination	12	4.4
Laboratory test (Sputum test, acid fast test)	17	6.3
Mantoux test	6	2.2
Others (history taking, coughing and screening)	120	44.4
Don’t know	94	34.8
Mode of transmission of TB in children		
Inhalation	121	44.9
Touching a person with tuberculosis	53	19.6
Exposure to cold	68	25.1
Don’t know	28	10.4
Choice of drugs for treating TB in children		
Isoniazid	25	9.3
Rifampicin	48	17.8
Pyrazinamide	10	3.7
Ethambutol	15	5.6
Others (Erythromycin, Septrin)	8	3.0
Don’t know	164	60.7
Common age of TB in children in TB endemic countries		
< 1 year	72	26.7
1-4 years	80	29.6
5-9 years	12	4.4
>10 years	49	18.1
Don’t know	57	21.1
Participants’ perceived role in TB prevention and control in children		
Health education and vaccination	91	33.7
Referral of cases	26	9.6
Physical examination	12	4.4
Medical history taking	18	6.7
Sputum test	9	3.3
Chest X-ray	3	1.1
Treatment	2	0.7
HIV testing	5	1.9
Avoid over-crowding	11	4.1
Don’t know	93	34.4

Figure 1 shows the participants overall knowledge level categorized into good knowledge and poor knowledge. Overall, only 69 (25.6%) of all the 270 participants had good knowledge. Among the 27 (10%) of the 270 participants who indicated that they had attended a training on TB in the previous 12 months, only 9 (33.3%) had good knowledge while the remaining 18 (66.7%) had poor knowledge.

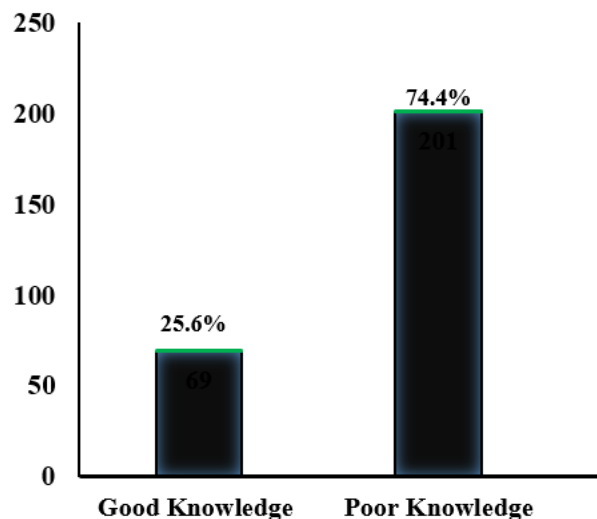


Figure 1:
Participants’ Overall Knowledge Score on Tuberculosis in Children

Participants’ Attitude of towards Tuberculosis Prevention and Control in Children: Participants’ attitude towards TB prevention and control in children were explored. The overall attitude score for all the 270 participants in figure 2 revealed that 46 (17%) participants (who scored 16 (60%) and above in the attitude score) had positive attitude. Among the 61 participants who had cared for children with TB at one time or the other, only 10 (16.4%) of them had positive attitude

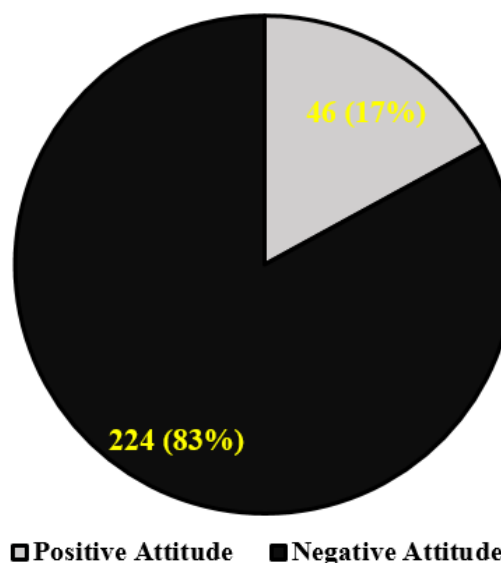


Figure 2:
Participants’ Attitudes towards Prevention and Control of Tuberculosis in Children

Table 3:
Participants' Reported Practice on Prevention and Control of Tuberculosis in Children

Variables	Frequency (N=61)	%
High risk of exposure to TB requires only a single dose of BCG vaccine for infants	Yes	23 37.7
	No	38 62.3
Contact screening is done for children in close contact with a TB case	Yes	27 44.3
	No	34 55.7
BCG vaccine is not used in children who are known to be HIV-positive	Yes	13 21.3
	No	48 78.7
Consider infant and under-five children as being at higher risk of TB	Yes	30 49.2
	No	31 50.8
Consider children with TB as not being infectious and therefore not likely to transmit TB	Yes	13 21.3
	No	48 78.7
Children who have close contacts of TB patients receive follow-up for a long time	Yes	15 24.6
	No	46 75.4
Consider children to be equally susceptible to TB drug resistant like adult	Yes	10 16.4
	No	51 83.6
Treatment of children with TB is usually six-month regimen	Yes	20 32.8
	No	41 67.2
Treatment outcomes in children with TB are generally good	Yes	21 34.4
	No	40 65.6
Consider clinical examination including growth assessment as essential in childhood TB management	Yes	20 32.8
	No	41 67.2
Ensure children with TB are screened for HIV	Yes	17 27.9
	No	44 72.1
Conduct contact tracing for TB	Yes	15 24.6
	No	46 75.4
Consider community mobilization as an important in prevention and control of TB	Yes	31 49.2
	No	30 50.8

Participants' Reported Practice on Tuberculosis Prevention and Control in Children: Regarding the practice of TB prevention and control in children, of all the 270 participants, 74 (27.4%) (who scored 22 (60%) and above in the practice score) had good practice. Also, among the sixty-one (22.6%) of the 270 participants who had ever provided care for a child with tuberculosis, only 14 (23%) of the 61 were active in children TB management and treatment. The practice of the 61 participants who had cared for children with TB at one time or the other is displayed in table 3. As shown in figure 3, only 18 (29.5%) of the 61 participants had good practice of TB prevention and control in children.

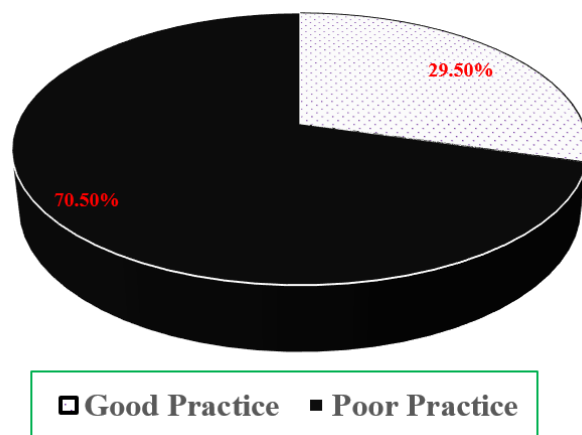


Fig. 3:
Practice Score for Participants who Ever Provided Care for Children with Tuberculosis

Factors Influencing Participants' Knowledge and Practice on Prevention and Control of Tuberculosis in Children: As presented in tables 4 and 5, ever attended any training on TB prevention and control, level of education and years of working experience at PHC level were not found to have any significant association with participants' knowledge and practice on prevention and control of tuberculosis in children ($P>0.05$). As regards practice, only good knowledge was found to have significant association with good practice among the participants ($P=0.000$) as presented in table 5. No significant relationship was also found between the attitude and practice of the participants ($P>0.05$).

Table 4:
Factors Influencing Participants' Knowledge on Prevention and Control of Tuberculosis in Children

		Total Knowledge Score Dichotomized			χ^2	P value
		Good Knowledge	Poor Knowledge	Total		
Ever been trained on TB prevention, treatment and control	Yes	31 (21.8%)	111 (78.2%)	142	2.184	0.139
	No	38 (29.7%)	90 (70.3%)	128		
Level of education	Ordinary Diploma	24 (28.2%)	61 (71.8%)	85	0.468	0.494
	Higher Diploma and above	45 (24.3%)	140 (75.7%)	185		
Years of working experience at PHC level	Below 10 years	42 (23.7%)	135 (76.3%)	177	0.901	0.342
	10 years and above	27 (29.0%)	66 (71.0%)	93		

Table 5:
Factors Influencing Participants' Practice on Prevention and Control of Tuberculosis in Children

	Practice Score for all Participants Dichotomized			CI	P value
	Good Practice	Poor Practice	Total		
Good Knowledge	69 (100%)	0 (0.0%)	69	245.5	0.000
Total Knowledge Score	Poor Knowledge	5 (2.5%)	196 (97.5)	201	
Level of education	Ordinary Diploma	25 (29.4%)	60 (70.6%)	85	0.250
	Higher Diploma and above	49 (26.5%)	136 (73.5%)	185	
Ever been trained on prevention and control of Tuberculosis	Yes	35 (24.6%)	107 (75.4%)	142	1.146
	No	39 (30.5%)	89 (69.5%)	128	
	Positive Attitude	14 (30.4%)	32 (69.6%)	46	
Total Attitude Score	Negative Attitude	60 (26.8%)	164 (73.2%)	224	0.367

DISCUSSION

Tuberculosis is a public health concern (WHO 2022). In this paper, a report is presented on primary health care providers' knowledge, practice and attitudes on prevention and control of childhood tuberculosis in selected PHC centres in Ibadan, Nigeria. Few studies have focused on childhood TB at PHC level in the study setting. Although tuberculosis is curable and preventable, child and adolescent TB is often overlooked by health providers and can be difficult to diagnose and treat (WHO 2022). TB control programs have focused on adults (Caminero and Scardigli 2016).

In the study, nurses/midwives constituted the majority while doctors constituted less than a quarter of the participants; other participants were community health workers. It was found in the study that over half of the participants had received a form of training on TB, but despite the training, only about a quarter of the participants had good knowledge about prevention, and control of tuberculosis in children. In fact, none of the participants mentioned TB GeneXpert which is the current gold standard in diagnosing TB. These findings show that PHC health care providers in the study setting are not adequately equipped to combat tuberculosis among children.

Similarly, a previous qualitative study in Tanzania had identified inadequate awareness of the burden of childhood tuberculosis, limited knowledge of clinical presentation and lack of clinical decision support strategies among clinical officers, assistant medical officers, assistant clinical officers and nurses (Bjerrum *et al.* 2012), Also in Peru, Chiang *et al.* (2014) identified knowledge gap regarding childhood tuberculosis among physicians, nurses and assistant nursing. Mohamoud *et al.* (2017) found significant gaps in knowledge and practice with regard to the management of paediatric TB among medical doctors and other clinical officers in Mogadishu, Somalia. Meanwhile, in a multi-country study involving Cambodia, Cameroon, Cote d'Ivoire, Sierra Leone and Uganda (Joshi *et al.* (2022) also had reported limited level of knowledge of TB in children among health workers (General practitioners, medical assistant, nurses, nursing assistants, midwives, laboratory technicians, radiology technicians, social assistants and community health workers

who were involved in the management of childhood TB). In contradiction, however, Waramlah *et al.* (2020) in a study conducted in Malaysia on TB infection control, reported good knowledge among PHC workers (Doctors, nurses, medical assistants, health inspectors, pharmacy personnel, laboratory personnel, radiology personnel, nutritionists and health attendants).

Training of health care providers has been identified as one of the priority activities in child and adolescent tuberculosis management (du Preez *et al.* 2022). Therefore, the knowledge gap revealed in this current study needs to be addressed more urgently through trainings and refresher trainings of health care workers especially at PHC level in order to build their capacity for childhood TB prevention, treatment and control at community level.

Furthermore, the findings of this study showed negative attitudes and poor practice toward prevention, treatment and control of childhood tuberculosis among majority of the participants. Poor practice was also found among majority of the participants who indicated that they had provided care for children with TB at one point or the other. These findings were contrary to previous findings in Cambodia (An *et al.* 2022) where participants had a good attitude regarding childhood tuberculosis detection and management. Joshi *et al.* (2022) also reported positive attitude of participants toward childhood TB case detection, diagnosis and management. However, findings from Vukugah *et al.* (2022) in Cameroon showed that the participants had suboptimal attitude towards Paediatric Tuberculosis Management. Meanwhile, the negative attitude of the participants might have been connected to their poor knowledge; perhaps having good knowledge might have impacted positively on their attitude also. Interventions should target improving both the knowledge and attitude of health workers towards childhood tuberculosis.

In this study, the practice concerning the prevention and control of childhood tuberculosis among the health workers was also found to be poor. This finding corroborates the findings of Joshi *et al.* (2022) in a study conducted in five African countries as well as the findings of Vukugah *et al.* (2022) in Cameroon. However, An *et al.* (2022) had reported good practice among healthcare providers in Cambodia.

This study showed no significant association found between ever attending any training on TB, level of education and years of working experience at PHC level and participants' knowledge and practice on prevention and control of childhood tuberculosis. Regarding practice, only good knowledge was found to have a significant association with good practice among the participants. This is an indication that positive outcome of childhood TB may depend on adequate knowledge among health providers. Similar findings were reported in Zaria, northern Nigeria (Olusola and Ahmadu 2019), where knowledge of general TB infection control also had a significant effect on good practice.

Contrary to the findings of this study, Vukugah *et al.* (2022) in Centre Region of Cameroon reported that having a bachelor's degree and above, working in the TB unit and having received training on paediatric TB management within five years had significant associations with good knowledge among health workers. Also in the same study, health workers who were general practitioners, nurses, and laboratory technicians were more likely to employ good practice on paediatric TB management compared to those in the other professional category.

It is worthy of note that the study of Vukugah *et al.* (2022) in Cameroon was conducted at secondary health care level and most of the participants were doctors and nurses, unlike this current study that was conducted at PHC level and many of the participants were PHC community health workers. This might have accounted for the differences in the level of knowledge and practice between the current study findings and the study of Vukugah *et al.* in Cameroon. The main strength of the study was that the respondents were requested to fill in the gaps provided on some of the question items to evaluate their knowledge and practice of the participants. These responses were then marked by the researchers using a marking guide which gave a more accurate picture of their knowledge and practice level.

However, the study also had some limitations. First, a purposive sampling technique was used for selecting eligible health care providers in each primary health centre. Secondly, there was no specific question item asking the participants whether they work in a TB Unit which might have probably positively influence their knowledge and practice level. Thirdly, the data for the study were collected in September 2020 when Covid-19 pandemic had disrupted the health care delivery system, perhaps the shift of focus to fighting Covid-19 pandemic distracted the health care workers from focusing on TB thereby negatively affected their knowledge and practice.

In conclusion, this study has revealed poor knowledge and practice and negative attitude of about primary health care providers on prevention and control of childhood tuberculosis in selected PHC centres in Ibadan, Nigeria. Only knowledge level was found to significantly influence good practice among the participants. Training and re-training of PHC health workers on TB is therefore recommended to improve the knowledge, attitude and practice of health providers who work at the grassroot.

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