Acta Scientific Women's Health (ISSN: 2582-3205)

Volume 4 Issue 4 April 2022

Research Article

Knowledge, Attitudes and Practices on Tuberculosis Control Among Grass Root Level Community Health Care Workers in the Rathnapura District, Sri Lanka

Lalitha Indrani Malwenna[1]*, NK Chintha Gunarathna[2], Hemali Nanda Malvenna[3], Kapila Bimal Kannangara[4], CKB Jayawardana[5] and NB Gamini[6]

[1]*Consultant Community Physician, Deputy Director (Training), National Institute of Health Sciences, Kalutara, Sri Lanka*

[2]*Consultant Community Physician, Deputy Director, District General Hospital, Kalutara, Sri Lanka*

[3]*Medical Officer, District General Hospital, Kalutara, Sri Lanka*

[4]*Provincial Director of Health Services, Sabaragamuwa Province, Sri Lanka*

[5]*Medical Officer Planning, Sabaragamuwa Province, Sri Lanka*

[6]*Medical Officer of Health, Sabaragamuwa Province, Sri Lanka*

***Corresponding Author:** Lalitha Indrani Malwenna, Consultant Community Physician, Deputy Director (Training), National Institute of Health Sciences, Kalutara, Sri Lanka.

DOI: 10.31080/ASWH.2022.04.0353

Received: March 17, 2022

Published: March 31, 2022

Abstract

Background: Interruption of transmission of tuberculosis requires timely diagnosis and completion of the full course of treatment.

Objective: To study knowledge, attitudes and practices of field health workers on tuberculosis and its management

Methods: Institutional based descriptive cross sectional study was conducted among primary health care workers in the field setup in Rathnapura district in Sabaragamuwa province, Sri Lanka; using a self-administered questionnaire. Level of knowledge was assessed in percentages. Attitudes were assessed using total attitude score converting into percentages and the Inter Quartile Range. Associated factors were assessed using chi square test for significance with p value <0.05. Practices were expressed as percentages for each practice statement.

Results: Overall knowledge was poor in 41.5%, good in 44.3% and very good in 14.2%. Significant relationship was elicited in relation to designation of participant being in the Environment and Occupational Health category (χ^2 = 14.797; p = 0.001), while no significant association between knowledge with age, educational qualifications, duration of service or participation to training programmes.

Overall attitude was poor/average in 21.5%, good in 62.5% and very good in 16.0%. Statistically significant positive association could be elicited between ages above 40 years (χ^2 = 53.334; p = 0.000), educational qualifications being Advanced Level and above (χ^2 = 199.737; p = 0.000), being married (χ^2 = 313.307; p = 0.000), having service of 10 years and above (χ^2 = 125.560; p = 0.000).

Practices were very poor among participants. Statistically significance existed that; the Environment and Occupational Health category referring significantly higher number (χ^2 = 271.802; p = 0.000), providing of more Direct Observed Treatment (χ^2 = 49.579; p = 0.000). Simultaneously between referral for treatment and participation for training programmes (χ^2 = 19.596; p = 0. 000). No significant relationships were elicited with age, educational levels, duration of service and the assessed practices. No statistically significant association between levels of overall knowledge and overall attitudes (χ^2 = 6.375; p = 0.173). The practice of conduction of health education sessions to the community showed significant association with the knowledge (χ^2 = 9.775; p = 0.044).

Conclusion: The level of knowledge and practices isn't compatible with the expected role of field health workers.

Keywords: Tuberculosis; Knowledge; Attitudes; Practices; Field Health Care Workers

Abbreviations

DOT: Direct Observed Treatment; BCG: Bacillus Calmet and Guarine; HIV/AIDS: Human Immuno Deficiency Virus/Acquired Immuno Deficiency Syndrome; TB: Tuberculosis; EPTB: Extra Pulmonary Tuberculosis; NPTCCD: National Programme for tuberculosis Control and Chest Diseases; MOH: Medical Officer of Health; PHI: Public Health Inspector; JMM: Joint Monitoring Mission; DOTS: Direct Observed Treatment Short Course; WHO: World Health Organization; NGOs: Non-Governmental Organizations; PHM: Public Health Midwife; SPHM: Supervising Public Health Midwife; SPHI: Supervising Public Health Inspector; PHNS: Public Health Nursing Sister; MDR/RR TB: Multi Drug Resistant/Rifampicin Resistant Tuberculosis; DGHS: Director General of Health Services; OPD: Out Patient Department; MCH: Maternal and Child Health; FP: Family Planning; SAQ: Self Administered structured Questionnaire; SPSS: Statistical Package for the Social Sciences; IQR: Inter Quartile Range; E&OH: Environment and Occupational Health; GCE/AL: General Certificate of Education/Advanced Level; GCE/OL: General Certificate of Education/Ordinary Level

Introduction

Background information

Tuberculosis is a communicable disease caused by the bacillus *Mycobacterium tuberculosis*. It commonly affects lungs, but can affect any other organ in the body except nails and hair. It has become the ninth leading cause of death worldwide. It has become the first reason to cause death due to single infectious agent, even above Human Immuno deficiency Virus/Acquired Immuno Deficiency Syndrome (HIV/AIDS) (leading cause of death due to a single infection). According to the global statistics in 2016, estimated number of cases of Tuberculosis (TB) was 10.4 million. Of them, 90% were adults, 65% were male, 10% were people living with HIV. Out of all cases, 56% were living in five countries in Asia; India, Indonesia, China, Philippines and Pakistan. Tuberculosis has been the cause of death among 1.3 million HIV negative people and among 374000 among HIV positive people [1].

With the comprehensive health care services provided free of charge at the service delivery point, Sri Lanka has combat communicable diseases like malaria and vaccine preventable diseases which are eradicated and eliminated or close for that. Further, provision of childhood immunizations, antenatal care and institutional deliveries are nearly 100% covered [1].

However, due to the increase of aging population together with increase of chronic non communicable diseases, chronic communicable diseases such as tuberculosis is in the increasing trend. Sri Lanka has been identified as middle burden country in relation to the disease tuberculosis in the global ranking. The estimates of the TB burden in Sri Lanka have been more or less static over the period from 2000 to 2016. In most years since 2000, case detection rates were below 70% (59 -74). The case detection levels vary widely among districts in the country. This could be related to either differences in underlying incidence, differences in the TB case detection or effectiveness of diagnostic procedures in health facilities. It could further be due to the fact that communities and field health staff are not well coordinated or systematically organized at grass root level for awareness and referral.

The estimated prevalence and incidence rates of all forms of TB were 109 and 66 per 100 000 population, respectively, in 2012 [1]. According to the epidemiological review conducted in 2017, the estimated number of cases for Sri Lanka for the year 2017 was 13000 [2]. However, about 4000 case are not notified leading to have a gap between the occurrence and identification of cases [2]. It has revealed that widening of this gap with reduction of notification from 10,329 to 8886 from 2011 to 2016. The case fatality rate (death rate) due to TB has been over 5% and the lost to follow up (lost to follow up rate) close to 4% in the last 3 years [3]. Total number of cases in the year 2019 is 8434 of which 7812 were new cases of which 2123 were Extra Pulmonary Tuberculosis (EPTB). Among retreatment cases, 374 were relapses, 110 treatment failures, 105 were loss to follow up.

The case fatality rate due to TB remains high especially in view of the low HIV prevalence. Although the rate of lost to follow-up among all TB patients decreased between 2008 and 2010 to 3.5%, it got increased in 2011 to 3.7%. In re-treatment cases, the lost to follow up represents 9.1%, thereby contributing to the low treatment success rate of 74.9% [3].

The proportion of Child TB cases was 3% (2012 and 2013) of all reported cases. These figures are not consistent with global expectations that TB in children could represent 5 to 8% of all cases [3].

Considered the characteristics of identified cases, two thirds of cases with pulmonary TB are smear positive; thus indicating the poor case identification on clinical grounds. Children seem to be more under diagnosed. According to the practicing disease surveil-

lance system in Sri Lanka, there is no active case finding at national level other than contact tracing of the diagnosed patients. It is also done by the involvement of both curative and preventive sectors. In order to identify the deficit of 4000 that undergoes un- notified, the existing six challengers have been identified in the Mid Term review 2017 by the Ministry of Health. Two major concerns are incomplete contact tracing and haphazardly conducted active case finding. These invariably lead to delay in diagnosis of active cases leading to high case fatality rate as well as further spread of the disease [4].

Considered Rathnapura district, the total number of cases identified in 2018 is 434. Within the district, 1148 contacts have been identified but screened only 557 (48.5%). Considered treatment success rate in all forms of TB in 2017, 43.6% cured while treatment completed in 89.9%. In the same year loss to follow-up is 3.6% while death rate is 3.6% [4].

Justification

In Sri Lanka, annual toll of deaths due to TB is around 1200. The treatment success rate is 84.6% which is below the WHO End TB strategy of 90%, expected to be achieved by 2020. Along with that, the National Programme for tuberculosis Control and Chest Diseases (NPTCCD) aims at achieving 95% reduction of deaths and 90% reduction of incidence by 2035 taking levels of 2015 as baseline. The high death rate (6.8% in the 2015 cohort) was the main reason for having lower treatment success rate in the country. Increasing numbers of old aged getting the disease and the associated co morbidities among patients has been identified as contributing to high death rate. Further, majority (2/3) of cases are sputum positive at the time of presentation indicating the delayed diagnosis of the disease. In addition, late case detection causes the spread of the infection in the community [2].

According to the practicing disease surveillance system in Sri Lanka, the identified cases are notified to Medical Officer of Health (MOH) for further field investigations by the range Public Health Inspector (PHI). According to the Joint Monitoring Mission (JMM) report for Sri Lanka 2014, while Sri Lanka has reached 100% Direct Observed Treatment Short course (DOTS) coverage, the analysis has shown that there is poor referral of TB symptomatic from many health institutions partially due to lack of awareness among health staff, therefore TB is not considered as a reason for chronic cough. Meanwhile, the stigma is still present [3].

With the alignment with World Health Organization (WHO) global strategy for tuberculosis prevention, care and control after 2015, the NPTCCD has revised its National strategic plan for 2015 to 2020 with five objectives. The first objective is to improve the TB control by detecting at least 80% of incident TB cases (all forms) by 2017 and 90% incident cases by 2020. This objective is expected to be achieved through seventeen strategies; the first being the use primary health care workers, other field level government officers, Non-Governmental Organizations (NGOs) and volunteers at MOH level for community awareness and referral of individuals with suspected symptoms for sputum microscopy [5]. To achieve this objective, the most important category is health care workers because they are by profession are a part of control of respiratory tract infections including tuberculosis. The primary health care workers specially the Public Health Midwife (PHM) who deals with eligible families and the PHI who deals with the community, are continuously working with community and thus have the highest chance of getting to know about undiagnosed cases in the community. The supervisory staff (Supervising Public Health Midwife [SPHM], Supervising Public Health Inspector [SPHI] and Public Health Nursing Sister [PHNS]) is also very important to ensure the service provision by the PHM and the PHI. Apart from that, all of them are providing DOTS for diagnosed TB patients who are treated in hospitals for initial phase and sent them for continuation of treatment in the community. In order to overcome the stigma and to complete the full course of treatment, the knowledge, attitudes of these officers are very crucial because according to the existing data, only 85% of patients complete the full course of treatment. Defaulting leads not only to increase morbidity and mortality, but gives rise to the development of Multi Drug Resistant/Rifampicin Resistant Tuberculosis (MDR/RR TB) in the country.

According to the General circular 01-27/2019 by the Director General of Health Services (DGHS), the plan is to screen all presumptive TB cases (patients presenting with symptoms or signs suggestive of TB, particularly cough more than 2 weeks) in the Out Patient Department (OPD). To strengthen that, suspected cases should be referred to the OPD [6]. It is very effective if the field health staff is motivated for that because they are the knowledgeable category that has contact with the general population. Thus, it is utmost important to assess the level of knowledge, attitudes and practices of field staff to achieve the set targets of the NPTCCD to end TB by 2035.

The National Strategic Plan 2015 - 2020 developed according to the WHO's new global TB control strategy, focusing on the

post-2015 era taking the JMM report for Sri Lanka 2014 for consideration seeking to re-structure TB control activities. One of the strategies is to increase the community awareness through the primary health care staff by referring suspects having symptoms of TB to the health centre for investigations. For that, the health staff should have the knowledge, attitudes as well as practices at adequate level. Thus, in order to plan the programme for the health staff, assessment of their initial levels of knowledge, attitudes and practices is essential.

Considered Rathnapura district, annual cases detected during 2019 is 378, of which 115 (30%) cases were extra pulmonary TB. It is lower that of 2018. Among all, 242 (64%) were bacteriologically confirmed cases. Clinical diagnosis has been applied only for 21 (5.5%). This data raises an important issue that, before confirming the diagnosis, there is a high possibility of those cases to spread the disease because 64% bacteriologically confirmed [7]. Existence of the highest proportion of EPTB in the country in 2018 reveals the delay in identifying and diagnosing cases which further reason for the disease to spread [4]. Ratthnapura has been identified to conduct a pilot district to monitor the achievement of case detection according to the WHO estimates. It has been estimated to have 166 cases in Rathnapura district in each quarter of the year. The set target was 80% of the expected number of cases; that is 133 [8]. Assessment the level of public health staff is necessary prior to implementation of the set strategies. It would be most useful in the planning process to achieve set targets.

Thus the objective was to study the Knowledge, attitudes and practices on tuberculosis and its management among primary health care workers in the Sabaragamuwa province because it is essential assess the baseline information affecting the service provision to construct local level strategies to achieve National targets.

Materials and Methods

This is an institutional based descriptive cross sectional study conducted to assess the knowledge, attitudes and practices on tuberculosis and its management among primary health care workers in the the Ratnapura district of in the Sabaragamuwa province in Sri Lanka. The study was conducted in all the MOH divisions of the Ratnapura district. The population of the Ratnapura district was 1226916 distributed among twenty MOH areas. The MOH is the authorized health unit and consists of field officers providing all preventive health services under the guidance of the MOH. The staff can be divided mainly to two broad categories; those involve service provision in relation to Maternal and Child Health and Family Planning (MCH) services which included PHM, SPHM, and PHNS; and among those involve in disease surveillance and environmental and occupational health activities (E&OH); that is PHI and SPHI.

Study population consisted of all the field officers other than doctors of the health unit staff with the total of 489 with 364 PHM, 17 SPHM, 14 PHNS, 86 PHI and 13 SPHI. All the staff members are included with the exclusion of those who are absent on the day of data collection.

The calculated sample size was 430 and thus all the available staff members (489) were included.

Study instrument was a Self-Administered structured Questionnaire (SAQ) consisted of socio demographic information of participants, questions on knowledge on TB, ten attitude statements on TB and five statements to assess practices of participants on TB management. The questionnaire was pre tested using 25 primary health care workers in an MOH division in the Kalutara district in the Western province in Sri Lanka.

Data was collected by all the members of the research team. All the members of the team were through on the questionnaire. Data collection was conducted on the monthly conference day of each MOH division within a short duration.

Considered the quality of data, the validity was ensured by training the team by the principal investigator to ensure uniformity of collecting information, to ensure completeness of the questionnaire, to develop a friendly atmosphere and build up a good rapport with the respondents.

Data analysis was carried out by using SPSS version 20. Categorical differences between knowledge and attitude groups were assessed using Chi-square test. $P < 0.05$ (95% confidence interval) was considered as statistically significant.

Knowledge on TB was assessed using 20 questions (single response multiple choice questions and open ended questions) on epidemiology, prevention and management of TB. The number of correct responses was converted to percentages; then the overall knowledge score was divided into three levels as poor (<40%), good (40-65%) and very good (>65%). The level of knowledge of each section was assessed as good (>40%) and poor (<40%). The relationship between socio demographic characteristics and the level of knowledge was assessed using chi-square test.

Attitudes on TB were assessed using total attitude score converting into percentages. The relationship between socio demographic characteristics and the level of attitudes was assessed using the grouped officers' levels of attitudes as 'Favorable (<40%), Neutral (40-86%) and unfavorable (87-100%) and the Inter Quartile Range (IQR).

Considered practices in relation to management of TB as a field health officer, the percentage of participants was expressed as a percentage for each practice statement. The different relationships between socio demographic characteristics and the level of knowledge, attitudes and practices were assessed using chi-square test.

Considered administrative requirements and ethical issues, permission from the Provincial Director of Health Services of the Sabaragamuwa Province and the Regional Director of Health Services of the Rathnapura District was obtained. Confidentiality was strictly maintained in such a way that data sheets were kept under lock and key and only the research team will handle data.

Ethical clearance was obtained from the Ethical Review Committee, National Institute of Health Sciences, Kalutara, Sri Lanka. After the interview, the participants were given a feedback on any problem identified with regard to the existing respiratory illness services etc. with necessary referrals.

Results

Data collection covered all the MOH areas in the district. The rate of participation was 451 (92.2%) and satisfactory. The participated group consisted of PHMs, SPHMs, PHNSs, PHIs and SPHIs. The two broad groups identified as services providing in Maternal and Child Health and Family Planning (MCH) and the number was 356 (78.9%), while the group providing Epidemiology, Environment and Occupational Health services (E&OH) and the number was 95(21.1%). All the participants are Sinhalese in ethnicity and Buddhist in religion. The age range of the participants was 25-65 years with mostly represented age group being 31-40 years (34.1) while 20.2% is more than 50 years old. Considered educational qualifications other than the Diploma which is achieved all of them to be qualified for all the posts they hold, 91.1% have passed in General Certificate of Education/Advanced Level (GCE/AL) only 1.1% were with General Certificate of Education/Ordinary Level (GCE/OL). There were 4.4% additional diploma holders while 3.3% of the participants had university degrees. Majority of the participants were married 84.0% while 14.2% unmarried. Considered the duration of service, majority (31.3%) were with service of 10-20 years while 27.1% were more than 20 years in service.

Among the participants, 58.1% had participated training programmes related to tuberculosis management and 25.6% within last three years. However, 49.3% participants had not read about tuberculosis within the last year. Further analysis revealed that a significant relationship exists between the category being E&OH group and the participation for training programmes on tuberculosis management (χ^2 = 25.550; p = 0.000). Simultaneously, significant relationship exists between the category being E and OH group and Reading on TB within last year (χ^2 = 38.948; p = 0.000).

Considered overall knowledge, it was poor in 41.5%, good in 44.3% and very good in 14.2% of participants. However, the knowledge among field health care workers seems highly inadequate many of the times. Among all 98.0% knew the disease causing agent as a bacterium and 97.1% knew the scientific name of the bacterium causing tuberculosis. Among all, 93.8% knew the mode of transmission of tuberculosis as respiratory. Knowledge on nature of infection (affecting organs, risk groups and favorable conditions for the spread of tuberculosis and signs and symptoms) was poor in 46.3% and good among 53.6% of participants. Knowledge on investigations done for diagnosis of TB was poor among majority (52.8%). Further, that of on treatment regime was unbelievably poor among 74.2% of participants. However, knowledge on DOT was good and very good in 59%, on giving correct advices for patients in 53.6%. Knowledge on side effects of anti TB drugs was poor in 57.9% of participants. Further, 62.3% had good knowledge on outcomes of discontinuation of treatment including emergence of MDR TB while 57.6% were knowledgeable about preventive measures of TB. However, 93.1% did not know about the exact role of BCG in prevention of TB. Knowledge on the occurrence of MDR was good in all and management of TB in pregnancy was correctly stated by 66.5% of participants.

Further analysis was carried out to assess the relationships between level of knowledge, with category of participants, educational level, duration of service, Participation for training programmes on TB. Significant relationship was elicited in relation to designation of participant being in the E&OH category (χ^2 = 14.797; p = 0.001), while no significant association between knowledge and age (χ^2 = 1.569; p = 0.456), educational qualifications (χ^2 = 6.872; p = 0.333), duration of service (χ^2 = 4.278; p = 0.370) and participation to training programmes (χ^2 = 0.659; p = 0.719).

Attitudes of the field staff on TB was assessed using 10 statements. Overall attitude was poor/average in 21.5%, good in 62.5% and very good in 16.0% of the participants. Having a patient with tuberculosis is a reason for stigma and discrimination was agreed by 7.2% and disagreed by 87.5%. The statement of most of people with chronic cough have tuberculosis was agreed by 69.1% and disagreed by 20.0%. For the statement of although patients with suspected tuberculosis are referred to hospital, they are not given proper care at hospital was agreed by 4.7% and disagreed by 88.1% meanwhile 8.8% have considered that referring patients with suspected tuberculosis is not of their duty. But 89.0% have considered it as a part of their duty. Among the participants 13.4% believed that the knowledge on tuberculosis and its management is adequate in patients with tuberculosis while 69.2% did not. Further 74.1% did not consider giving DOT has become a problem for them but 1.8% considered it. Among all, 63.4% did not have the fear of having tuberculosis when patients come for them for DOTS, but 4.2% were fear of that. Not only that, 32.4% was not in either category. Among the participants 7.9% believed that it is better to give drugs for the patient to take home than giving as DOTS while 67.6% disagreed for that. Considered the support given by the National control programme, 19.6% believe that they are not given adequate support and facilities to provide DOTS by the control programme while 24.4% did not. However majority (55.6%) did not have any idea about the support given by the National control programme.

Further analysis was carried out to assess the relationships between level attitudes with category of participants, age of the participant, educational level, duration of service, marital status and participation for training programmes on TB. Attitudes did not show significant relationship with the category of participants being either MCH or E& OH group ($\chi^2 = 1.041$; $p = 0.594$) and participation to training programmes on TB ($\chi^2 = 5.623$; $p = 0.060$). However, statistically significant association could be elicited between ages above 40 years having more favorable attitudes ($\chi^2 = 53.334$; $p = 0.000$), educational qualifications more than GCE (A/L) having more favorable attitudes ($\chi^2 = 199.737$; $p = 0.000$), being married to have better attitudes ($\chi^2 = 313.307$; $p = 0.000$), duration of service being more than 10 years to have better attitudes ($\chi^2 = 125.560$; $p = 0.000$).

Practices expected by primary health care workers were assessed in relation to conduction of health promotion programmes in the field, referring suspected patients for treatment, giving DOT, refusing giving DOT, contact tracing, participation in defaulter tracing and increasing awareness among contacts. Among all, only 33.9% have conducted regular health promotion programmes in the field while 56.1% have conducted on and off. Considered referring contacts and suspected for treatment 71.0% have not referred even a single case while 29.0% have done. Majority of them have referred to the district chest clinic (24.4%). Among participants only 11.9% have ever given DOT during their service while 88.1% has not got any chance. Among all only 5.2% have not given DOT due to fear of contacting the disease while 93.6% has not responded to that statement. Only 8% has participated in default tracing while only 25.6% have done contact tracing. Among all, only 22.2% have involved in increasing awareness among contacts.

Considered practices Among all, significant association found between the category and the referral of symptomatic individuals for treatment; the E and OH category referring significantly higher number of patient ($\chi^2 = 271.802$; $p = 0.000$) and provision of DOT by the E& OH category compared to MCH group ($\chi^2 = 49.579$; $p = 0.000$). Significant association could not be elicited in relation to category of workers and the conduction of health education in the community ($\chi^2 = 4.029$; $p = 0.133$), defaulter tracing ($\chi^2 = 2.217$; $p = 0.137$). Simultaneously statistical significance with the age of the participants in relation to conduction of health education sessions in the community ($\chi^2 = 0.088$; $p = 0.957$), referring for symptomatic patients for treatment ($\chi^2 = 0.562$; $p = 0.755$), giving DOT ($\chi^2 = 1.709$; $p = 0..425$), participate in default tracing ($\chi^2 = 0.298$; $p = 0..585$). Further, the age of the participant did not have any statistically significant association with the conduction of health education in the community ($\chi^2 = 0.088$; $p = 0.957$), referral for treatment ($\chi^2 = 0.562$; $p = 0.755$), giving DOT ($\chi^2 = 1.709$; $p = 0.425$) and participate in default tracing ($\chi^2 = 0.298$; $p = 0.585$). It was tested for the significant association between educational levels and the same practices. Educational level of the participant did not have any statistically significant association with the conduction of health education in the community ($\chi^2 = 7.795$; $p = 0.254$), referral for treatment ($\chi^2 = 4.851$; $p = 0.563$), giving DOT ($\chi^2 = 2.898$; $p = 0.822$) and participate in default tracing ($\chi^2 = 2.090$; $p = 0.554$). Further, the duration of service was also did not show any statistically significant association with any of the practices as with the conduction of health education in the community ($\chi^2 = 1.799$; $p = 0.773$), referral for treatment ($\chi^2 = 3.705$; $p = 0.447$), giving DOT ($\chi^2 = 2.898$; $p = 0.822$) and participate in default tracing ($\chi^2 = 2.337$; $p = 0.311$). Next, above mentioned practices were assessed for the presence of significant relationship with the participation for

training programs by the study individuals. There was a significant relationship for referral for treatment and participation for training programmes (χ^2 = 19.596; p = 0. 000). However, could not elicit significant relationship for any other practices and participation for training programmes: health education in the community (χ^2 = 3.037; p = 0. 219), giving DOT (χ^2 = 5.763; p = 0. 056) and participate in default tracing (χ^2 = 3.640; p = 0. 056).

Finally, the associations between the level of knowledge, attitudes and practices were also assessed. However, statistically significant association could not br fount between the levels of overall knowledge and overall attitudes (χ^2 = 6.375; p = 0.173). considered practices, only the practice of conduction of health education sessions to the community showed significant association with the knowledge (χ^2 = 9.775; p = 0.044).

Discussion

In Sri Lanka, management of TB consists of identification of symptomatic individuals and contacts of diagnosed patients for further investigations, inward treatment of infective cases and home based care for non infective patients until completion of the full course of antibiotics including Direct Observe Treatment (DOT) as well. Both studied groups involve in activates related to prevention and control of TB. However, the MCH group attends basically during immunization with BCG and referring children under five years if found having acute respiratory tract infection. Both groups involve giving DOT for non -infective patients. Prevention and control of TB belongs to the E&OH group who are dealing with epidemiology. Therefore the E& OH group has been identified as field level health care workers performing investigations of notified TB cases from hospitals, implementation of preventive activities, defaulter tracing and contact tracing. Further, they involve all the field level preventive activities including health promotion. This would be the reason for them to have more training programmes on TB. Since TB is directly related to their service provision they would have read more on the topic than those in the MCH group; thus showing statistically significant association. However, the alarming pandemic of Covid 19 would have exerted a big effect on the feasibility of the staff to read on the subject and also to conduct continuous training programmes during 2020 and 2021. All categories of field staff were overburdened with Covid 19 preventive activities, limiting the chances of having such activities. This would have affected the levels of knowledge and practices as well.

In any service category, the knowledge should be upto date to provide expected services. In Sri Lanka, training curricular of both groups consist of prevention and control of TB including treatment regimens as well. During their field work, they must know the assessed subject areas in the study to provide services including health promotion. Since they are considered as the most important grass root level field workers communicating directly with the community, lack of required knowledge would greatly affect their expected performance. Having even a single service provider who doesn't know the causative organism should be considered as a serious issue. Further, having such poor knowledge around 40-50% in relation to the nature of the infection, investigations and drug management including DOT should be considered a serious issue as this knowledge is essential for field level management of TB. Further, not knowing the role of BCG is alarming issue related to the communication of correct health messages to the community. Not knowing about management of TB during pregnancy will greatly affect the quality of service as almost 79% of participants in the MCH group who are directly dealing with maternal care. Considered significant associations to knowledge, higher level of knowledge in E&OH group can be due to more reading and involving in field activities by them compared to the MCH group as elicited previous finding. However, not having significant association even in relation to duration of service or to the factor of participation to training programmes raises the issue in selecting the appropriate methodologies in updating their knowledge.

Compared to knowledge, the level of attitudes seems to be better than the level of knowledge among all the participants. However, having poor attitudes among 21.5% will exert a direct effect on the quality of service because these attitudes are related to service provision at field level including providing DOT. According to the findings of associations of relationships, having poor attitudes among young field workers, short duration of service will exert a significant effect because they have to work for 2-3 decades in the service and the quality of service will be badly affected for such long duration causing further worsening of the situation. Most of the youngers are still unmarried and had no chance of doing further studies, thus the same group is having poor attitudes compared to married and more qualified individuals. If we are to achieve 95% reduction of deaths and 90% reduction of incidence by 2035 taking levels of 2015 as baseline, knowledge as well as attitudes must be favorable towards active involvement on prevention of TB.

Considered practices, both categories in the study are supposed to do referral of symptomatic and provision of DOT. Investigation of

notified cases, contact tracing and defaulter tracing is considered as a main responsibility of the PHIs. All the assessed items in the study pertaining to practices are in the national guidelines of prevention and control of TB, to be fulfilled by the field health workers. However, performances in all the items checked are very poor, thus giving room for poor preventive activities. This would invariably affect the case detection, treatment completion and finally the national targets set to be achieved by 2035.

Finally the not detection of significant association between the overall knowledge and attitudes reveals that knowledge does not depend only with good attitudes, but it needs regular continuous professional development activities which is lacking in the country's health system in relation to the subject at the moment. Further, the presence of significant association between knowledge and the practice of conduction of health education activities in the community reveals that the confidence gets developed in the professionals so that they involve those preventive activities highlighting the importance of continuous updating of knowledge and the need of planning such programmes.

Variable	Frequency (N = 451)	%
Age		
21-30	98	21.8
31-40	154	34.2
41-50	108	24.0
51-60	91	20.0
Race		
Sinhala	451	100%
Religion		
Buddhist	451	100%
Marital Status		
Un Married	64	14.2
Married	379	84.0
Divorced	2	.4
Separated	1	.2
Widowed	5	1.1
Education qualifications		
GCE O/L completed	5	1.1
GCE A/L completed	411	91.1
Diploma	20	4.4
Degree	15	3.3
Designation of participant		
MCH group (PHM, SPHM and PHNS)	356	78.9
E&OH group (PHI and SPHI)	95	21.1
Period of health service		
< 1yrs	15	3.3
1-5 yrs	104	23.1
6-10 yrs	69	15.3
11-20 yrs	141	31.3
> 20 yrs	122	27.1
Participation for training programs		
Yes	262	58.4
No	187	41.6
Reading on TB within last year		
Yes	217	47.1
No	221	49.3

Table 1: Distribution by socio demographic characteristics of participants.

Variable	Yes	No	Significance
Participation for training programs*			
MCH group	185	169	$\chi^2 = 25.550$
E&OH group	77	18	df = 1, p = 0.000
Reading on TB within last year**			
MCH group	144	209	$\chi^2 = 38.948$
E&OH group	73	22	df = 1, p = 0.000

Table 2: Distribution by socio demographic characteristics of participants.

* Two participants have not responded.

**Three participants not responded.

Knowledge component	Response	
	Good	Poor
Disease causing agent	98.0	2.0
Scientific name	97.1	2.9
Mode of transmission	93.8	6.2
Knowledge on nature of infection	44.5	55.4
Risk groups/conditions	53.6	46.3
Knowledge on investigations done for diagnosis of TB	47.2	52.5
Knowledge on treatment regime	25.5	74.5
knowledge on DOT	59.0	41.0
Knowledge on giving correct advices for patients	53.7	46.3
Knowledge on drug side effects	42.1	57.9
Knowledge on outcomes of discontinuation of treatment	42.3	37.7
Knowledgeable about preventive measures of TB	57.6	42.4
Knowledge on role of BCG in prevention of TB	6.9	93.1
Knowledge on MDR	100.0	0.0
m Knowledge on management of TB in pregnancy	66.5	34.5
Total	58.5	41.5

Table 3: Distribution by the level of knowledge of participants.

Attitude component	Response	
	Agreed	Disagreed
Having a patient with tuberculosis is a reason for stigma and discrimination	7.2%	87.5%.
Most of people with chronic cough have tuberculosis	69.1%	20.0%.
Although patients with suspected tuberculosis are referred to hospital, they are not given proper care at hospital	4.7%	88.1%
referring patients with suspected tuberculosis is not of their duty	8.8%	89.0%
Knowledge on tuberculosis and its management is adequate in patients with tuberculosis	13.4%	69.2%
giving DOT has become a problem for them	74.1%	1.8%
Have fear of having tuberculosis when patients come for them for DOTS	4.2%	63.4%
It is better to give drugs for the patient to take home than giving as DOTS	7.9%	67.6%
They are not given adequate support and facilities to provide DOTS by the control programme	19.6%	24.4%

Table 4: Distribution by the level of attitudes of participants.

Practice component	Response	
	Yes	No
Conduction of health promotion programmes in the field frequently	33.9%	66.1%
Referring suspected patients for treatment	29.0%	71.0%
Giving DOT	11.9%	88.1%
refusing giving DOT	5.2%	Not responded
Contact tracing	25.6	74.4%
Participation in defaulter tracing	8.0%	92.0%
Engage in increasing awareness among contacts	22.2	77.8%

Table 5: Distribution by the level of practices of participants.

Variable	χ^2	df	Significance (p value)
Designation of participant and the knowledge	14.797	2	0.001
Age of participant and the knowledge	1.569	2	0.456
Education and the knowledge	6.872	6	0.333
Service and the knowledge	4.278	4	0.370
Participation in training and the knowledge	0.659	2	0.719

Table 6: Significant associations in relation to knowledge of participants.

Variable	χ^2	df	Significance (p value)
Designation of participant and attitudes	1.041	2	0.594
Participation in training and attitudes	5.623	2	0.060
Age of participant and attitudes	53.334	2	0.000
educational qualifications and attitudes	199.737	2	0.000
duration of service and attitudes	125.560	2	0.000
Marital status and attitudes	313.307	4	0.000
Participation in training and attitudes	5.623	2	0. 060

Table 7: Significant associations in relation to attitudes of participants.

Variable	χ^2	df	Significance (p value)
Designation of participant and health education to community	4.029	2	0.133
Designation of participant and referral of symptomatic individuals for treatment	271.802	2	0.000
Designation of participant and provision of DOT	49.579	2	0.000
Designation of participant and defaulter tracing	2.217	1	0.137
Age of participant and health education to community	0.88	2	0.957
Age of participant and referral of symptomatic individuals for treatment	0.562	2	0.755
Age of participant and given DOT	1.709	2	0.425
Age of participant and Participate in default tracing	0.298	1	0.585
Educational level of participant and health education to community	7.795	6	0.254
Educational level of participant and referral of symptomatic individuals for treatment	4.851	6	0.563
Educational level of participant and provision of DOT	2.898	6	0.822
Educational level of participant and defaulter tracing	2.090	3	0.554
Service and health education to community	1.799	4	0.773
Service and referral of symptomatic individuals for treatment	3.705	4	0.447
Service and given DOT	2.898	4	0.822
Service and Participate in default tracing	2.337	2	0.311
Training receiving and health education to community	3.037	2	0.219
Training receiving and referral of symptomatic individuals for treatment	19.596	2	0.000
Training receiving and given DOT	5.763	2	.056
Training receiving and Participate in default tracing	3.640	1	.056

Table 8: Significant associations in relation to practices of participants.

Conclusion

Although attitudes were favorable, the levels of knowledge as well as practices among field level preventive health care workers are not satisfactory to achieve the set targets and it requires continuous professional development programmes and updates of the health system frequently.

Acknowledgements

The support extended by the District Director of Health Services, all the Medical Officers of Health in the Ratnapura district and all the participants are highly appreciated.

Conflict of Interest

No any conflict of interest exists.

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