Original Research Article

Effect of training on frontline health workers' knowledge and attitude towards tuberculosis screening and case finding in Oyo state, Nigeria

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ABSTRACT

Background: Nigeria accounts for 11% of all undetected, 'missing' Tuberculosis cases. TB control is better achieved by improving the knowledge and attitude of frontline health workers (FLHWs) and this study aims to examine the effect of training on the level of knowledge and attitudinal disposition of FLHWs towards TB screening in Oyo State, Nigeria.
Methods: Fifty-one (51) FLHWs enrolled on both intervention and control arms were trained on TB and Hypertension respectively. Outcomes were scores from each construct of the questionnaire administered at baseline and 8 weeks post intervention. The study was approved by Babcock University and Oyo State Ministry of Health.
Results: Results showed that about 88% were females, CHOs were the most prominent cadre- 64%. At baseline, mean knowledge score at the intervention arm was 10.80 (control 10.61), range was 8-13 (control 7-13) and 61% had good knowledge (control 27%); this difference was however not statistically significant, p=0.55. Post intervention, all participants (100%) on the intervention arm had a good knowledge (control 73%), 47% of participants had good attitude score (control 12%). Mean knowledge score was 15.73 (control 11.92) and mean attitudinal score was 11.06 (control 8.86). Knowledge and attitude scores were statistically significantly higher in the intervention group <0.001.
Conclusions: The study provides valuable information on the existing training gap at the lower levels of care towards TB control. Further study would be required to determine the effect of a change in knowledge and attitude on TB case finding.

Keywords: Tuberculosis screening, Training, Knowledge, Attitude, Frontline health workers

INTRODUCTION

Tuberculosis (TB) is an infectious disease caused by Mycobacterium tuberculosis. It affects primarily the lungs (pulmonary tuberculosis) and it is a major infectious killer disease worldwide.[1]

Nigeria, ranks sixth globally among all the high burden countries for tuberculosis with an incidence rate of 219 per 100,000 population.[2] Over 400,000 new cases are reported annually and the country accounts for 11% of all undetected, undiagnosed or unreported 'missing' cases worldwide.[2] In 2020, only about 29% of estimated cases were detected, diagnosed and placed on treatment.[2]

Intensified efforts to improve TB diagnosis, treatment, and prevention are needed to meet global End TB targets. Noe et al opined that the control of Tuberculosis is better achieved by improving the knowledge of frontline health workers (FLHWs). Poor attitude towards TB screening and stigmatization has contributed to the ineffective control of the disease.[3] This poor attitude alongside poor knowledge of TB, had also been found to be responsible for over a 70 percent of the major barriers to patients' adherence to treatment.[4] Sub-optimal knowledge of

FLHWs on TB screening and triaging has also been observed to increase their risk of exposure to TB infection.[5]

This study aims to examine the effect of training on the level of knowledge and attitudinal disposition of frontline health workers (FLHWs) towards Tuberculosis screening in Oyo State, Nigeria.

METHODS

A quasi-experimental using a quantitative approach with comparisons made between the outcomes of two similar groups of frontline health workers. Multi-Stage sampling technique was employed in the selection of participating health facilities. Two (2) of the three (3) senatorial districts- Oyo South (intervention) and Oyo North (control) senatorial districts were purposively selected for this study. Fifty-one (51) front line health workers from selected health facilities across all the 9 Local Government Areas (LGAs) in Oyo South senatorial district that met the inclusion criteria; and consented to participating in the study were enrolled into the intervention arm. Health workers from the following LGAs were enrolled in the intervention group- Ibadan North, Ibadan North East, Ibadan North West, Ibadan South East, Ibadan South West, Ibarapa Central, Ibarapa North, Ibarapa East and Ido while Atisbo, Irepo, Iseyin, Itesiwaju, Iwajowa, Kajola, Ogbomoso North, Ogbomoso South, Olorunsogo, Orelope, Oriire, Saki East and Saki West were enrolled into the control group. The study was conducted between January and March, 2022. Ethical approval for the study was obtained from Babcock University Health Research Ethical Committee (BUHREC) and the Oyo State Ministry of Planning, Research and Statistics. Signed consent forms were also obtained from the respondents.

All FLHWs who expressed interest in the study after detailed information about the study had been provided were allowed to participate. These were also FLHWs from health facilities within the selected Senatorial district who had functional DOTS clinic and TB laboratory domiciled within their health facilities. Front-line health workers who declined to participate, who were not on day duty shift during the period of study, health workers from privately owned health facilities and others with low average daily clinic attendance (below 50 clients per day) were excluded from participating in the study.

Respondents on the intervention arm were trained on TB and TB screening using the Federal Ministry of Health and National Tuberculosis and Leprosy Control Program Module for training of General Health care workers, sixth edition.[6] They were also trained on COVID-19 Infection prevention and control (IPC) measures based on WHO/NCDC guidelines.[7] The control arm was trained on basic information and management of Hypertension making use of the CDC manual for the training of district health workers.[8] The primary outcomes were the knowledge level and attitudinal disposition scores from each construct of the questionnaire administered at baseline and at 8 weeks post training.

Sample size determination

The following parameters were considered in the computation of sample size for the study. The documented prevalence for TB notification of 24% and a relative difference of 30% in case finding was accepted to be significant.[9] Hence the mean difference between the treatment and control arm (μT-μC) was set at 0.3.[10] The level of significance (p value) and Power of the study were set at 5% and 80% respectively. Hence, Standard normal deviates (z score) $Z\alpha$ and $Z\beta$ were 1.960 and 0.84 respectively at a Confidence interval of 95%. The sample size was computed using the sample size formula for a quasi-experimental superiority trial as described in the literature and arrived at 46 participants for each study groups.[11] Ten percent (10%) was added for attrition. Fifty-one front-line health workers were assigned to each group. At the end of the enrolment process, 2 participants from the control group withdrew from the study. Therefore, based on these, a total of 100 participants were enrolled for the study, 51 on the intervention group and 49 on the control group within the 2 senatorial zones.

Instrumentation

The instrument deployed for this study was a semi-structured, questionnaire constructed based on the validated WHO Advocacy, communication and social mobilization for TB control: A guide to developing knowledge, attitude and practice surveys instrument.[12] It contains 3 sections. Section A captured socio-demographic characteristics of the participants. This included the age, gender, marital status, professional cade, highest educational qualification, level of health facility, OPD unit and questions related to previous TB trainings. Section B captured questions related to personal level characteristics of participants that drive behaviour and antecedents to behaviour towards TB screening. These include questions related to knowledge that are capable of influencing behaviour in a specific direction; and in the context of this study, TB screening.[13] The third section asked attitudinal questions that 'reinforce' and 'enable' the adoption of the health behaviour, that is, TB screening. The instrument was also translated to Yoruba language and disseminated before the commencement of training and at week 8 post training. The average questionnaire filling time was estimated to be 12 minutes.

The face validation was done by the Project Supervisor, a Professor of Public Health and other lecturers at the School of Public and Allied Health. The contents of the questionnaires were strengthened by ensuring that they are items extracted from peer reviewed literatures and WHO validated TB Survey questionnaire.

The internal consistency of the questionnaire was assured through test retest with equivalent groups (n=10) away from intervention area. Content and item analysis was conducted with Cronbach alpha range of 0.70 to 0.78 computed.

Data management and analysis

IBM® Statistical package for social sciences (SPSS) statistical software (version 20) was used for data analysis. Test for symmetry to establish the necessary conditions for normality were performed and the results led to the choice of non-parametric methods (Mann-Whitney U test and Wilcoxon-Signed Rank test) for statistical test of hypotheses. Descriptive analysis of the sums for the answers of each section was done and the mean values and standard deviation computed. Results are presented in tables, frequencies, proportions and percentages.

Knowledge of TB was analyzed by assigning 1 to each correct answer to 14 knowledge questions and '0' to each incorrect answer. One question was assigned a maximum of 2 points for correct answers, 1 point and zero for partially correct and incorrect answers respectively. The sum obtained by each respondent ranging from 0 to 16 was used in assessing level of knowledge. A score of 0-6, poor, 7-11, fair while 12-16 was accepted to be optimal. This also was applied to attitudinal disposition to TB where expected sum also ranged from 0 to 16.[14]

SPSS® statistical software (version 20) was used for statistical analysis. Descriptive analyses of baseline scores were presented in percentages and proportions. The association between knowledge and attitude was tested using chi-square. Significance was considered at a p<0.05. Test for asymmetry was performed and non-parametric methods were employed to compare the mean differences between the 2 groups. Mann-Whitney U test was used to test the mean difference between the two groups. Wilcoxon-signed rank test was applied to test the degree of relationship and statistical significance between the mean scores at each arm comparing pre and post intervention for each arm.

RESULTS

One hundred questionnaires were submitted by the respondents out of a hundred and two expected. This gave a response rate of 98 percent which was considered good enough for the study. The modal age group was 41-50 years (38%) with 74% (74/99) being aged 40 years and above. The data shows that there was no significant difference in the age distribution between both arms (p=0.28). There were more females 88% (88/100) than males 12% (12/100) in both arms and the difference in sex distribution between both arms was not statistically significant (p=0.94). The CHOs were the most prominent cadre- 64% (64/100) distantly followed by the Registered Nurses/Midwives (20%). The difference in distribution of

cadres among the respondents in both arms was not statistically significant (p=0.39). Almost all respondents (97%) were from the Primary Health Centres, mostly at the general out-patient departments (91%). Ninety percent (90%) had paid employments while 10% were ad hoc or volunteer workers. Only 4% reported a chronic illness and Hypertension was the most prominent of all reported chronic illnesses 66.7% (Table 1).

Table 1: Demographic characteristics of the study participants.

Variables	Control group (n=49)	Intervention group (n=51)	Total (n=100)	P
Age (years)				
<20	0	0	0	0.28
21-30	14	12	26	
31-40	2	1	3	
41-50	14	24	38	
>50	19	19	3	
Gender				
Male	6	6	12	0.94
Female	43	45	88	
Cadre				
CHEW	4	9	13	0.39
CHO	32	32	64	
RN/RM	12	8	20	
Others	1	23	3	

About 53% of the CHEWs (7/13) had good knowledge of TB followed by the CHOs with 42% (27/64) and RN/RM, 0% (0/20). Forty-two (42) percent (17/40) of respondents who were once DOTS officers had good knowledge of TB compared with 27% (16/59) who were never DOTS officers. Forty-six (46) percent (46%, 30/65) of respondents with previous formal training on TB had good knowledge compared with 11% among those without any previous formal training. However, there seem to be no difference in attitude between these two groups (10.7% versus 11%). Chi-square test of association was performed to assess the relationship between knowledge and attitude. There was a significant relationship between the two variables, X2 (2, n=100)=9.992, p=0.007, effect size was however small (0.25).

Total knowledge score ranged from 7 to 13 with an average total knowledge score of 10.7 (SD 1.4) with only 34% (34/100) having good knowledge of Tuberculosis. Attitudinal scores ranged from 5 to 13, mean attitudinal score was 8.59 (SD 2.225). Only 11 percent (11/100) of the respondents had a good attitude towards TB screening, a larger proportion (80%) had fair attitude while 9% had poor attitude.

All respondents (100%, 51/51) on the intervention arm had a good knowledge after the training compared with 73% (36/49) of respondents on the control arm.

Forty-seven percent (47% 24/51) of respondents on the intervention arm had good attitude score compared with 12% (6/49) among the control.

Non-parametric Mann-Whitney U test was used to compare the knowledge and attitude categories among the two groups eight weeks post intervention at p<0.05. The mean knowledge rank for the intervention group was 74.79 and the control group, 25.21 (U=10.5, p=0.000). Mean attitude score rank was 63.03 for the intervention group and 37.47 for the control group (U=611, p=0.000). It can be concluded that knowledge and attitude score at the intervention group was statistically significantly higher than the control group after the intervention.

DISCUSSION

Similar to many other studies, the knowledge of TB among frontline health care workers is generally poor.[4,17] Ibrahim et al 2014 reported that only 43.3% of FLHWs in Plateau State, Nigeria had good knowledge of TB care and Sima et al reported only 36% at a district in Ethiopia.[4] A similar study conducted in Ogbomoso town Oyo State reported 40% inadequate knowledge of the TB treatment guidelines and 30% of the health workers having poor attitude towards TB services.[16]

This is not very different from similar countries in Africa with high TB burden (HBCs) like Uganda and Mozambique. Health care workers (HCWs) in Uganda, in a study, showed 38% of HCWs had inadequate basic knowledge of TB and this inadequacy was associated with not attending TB Infection Control (TBIC) training.[17] This was also observed to have contributed to the poor attitude towards TB Infection Control. The study called for the need to train HCWs in TBIC in order to improve their knowledge and attitudes.[17] This also buttresses the importance of periodic and institutionalized training for front-line health workers in HBCs in order to achieve an epidemic control of Tuberculosis.[16]

Observation of TB knowledge, attitude and practice among health workers in Southern Mozambique also revealed that midwives had the lowest knowledge of TB and those that had never worked with TB patients had lower practice scores than those that had been working.[3] Only 26.4% of the health workers could correctly identify TB as one of the most likely diagnoses in a patient vignette with a persistent cough, night sweats and fatigue in the context of a close relative with similar symptoms. The study identified key areas for training on TB and stressed the need for continuous re-training of all TB front-line health personne.[13]

Limitation of study

This study has some identified limitations. Firstly, the external validity might be affected by its relatively small sample size. This study was also unable to establish the missing link between the acquisition of good knowledge about TB by the participants and the persistent poor attitude towards TB screening. The timeframe allowed for the completion of the study did not also allow the exploration of the secondary outcomes of confirmed TB case detection. Nonetheless, this study offers novel findings that may be applied to similar settings and TB control program implementation.

CONCLUSION

The study to determine of the effect of training on FLHWs' knowledge and attitude towards TB and TB screening, provides valuable information on the existing gap at the lower levels of care towards TB control. This study provides impetus for the need for periodic training that is tailored towards the building of FLHWs capacity regarding TB. Further study would be required to determine the effect of a change in knowledge and attitude on TB case finding.

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