

Factors Contributing to Low Tuberculosis Case Detection in West Akim Municipality of the Eastern Region of Ghana; A Community and Health Facility Based Study

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Abstract

This research has a keen interest into assessing health and community related factors that contribute and influences low TB case detection rate in the West Akim Municipality of the Eastern region of Ghana. Data was collected from a target group of community members and health workers using a well-structured questionnaire. Data from the field was collected using Epi Info 7 and then, exported to Microsoft Excel and finally transferred to SPSS version 24 for the analysis. Some statistical techniques such as descriptive statistics, reliability of scale, t-test of independence, chi-square and analysis of variance was used to obtain results from the data analysis.

Community related factors that has been identified as possible contributors to low TB detection rate are as follows, the availability of alternative means of health care (traditional healers, prayer camps, and herbs to manage suspected cases of TB. This turns to keep people away from the health facilities. The long time (2 days) it takes for an individual to get tested and to receive his/her tested results (time of diagnostics). The high levels of experienced stigma associated with psychological distress on suspected people with TB and on friends and relatives living with TB patients. the low knowledge of TB among some reasonable number of community members. The study also identified the possible health related factors influencing low TB case detection rate such as, Low TB trained personals and low TB education during health talks in creating awareness that TB is preventable, curable and treatable and that suspected people with TB (cough for more than two weeks) should seek medical attention. Community health nurses not including TB screening as part of their home visitation program and low level of contact tracing could also contribute to the low case detection rate. The highly inadequate number Gene Xpert machines, DOT centres and laboratories for the diagnostics of TB. The study also found that, TB stigma even existed among health care providers against suspected patients. This negatively influence the health seeking behavior among suspected patients.

This study became necessary to generate information for the Ghana national TB control Programme for appropriate remedial actions to be taken to forestall any catastrophe that may result from undetected and untreated TB cases in the West Akim municipality.

Keywords: Gene Xpert machines, DOT Centres, Stigmatization, Psychological Distress, TB screening, Low TB Case Detection.

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1. Introduction

Anyone can be exposed to or get Tuberculosis. Tuberculosis is transmitted or spread from one person to another person through droplet of saliva or mucus explosion, sneezing, coughing, shouting, singing, as this may contain the T.B bacteria if the person has the disease and is out of stage.

If a healthy person breath in these droplets, the mycobacterium can lodge in the lungs resulting in the type of tuberculosis known as pulmonary tuberculosis. The mycobacterium can also migrate through the blood stream and also affect other organs of the body such as the skin, kidney, bone, joints, spine, brain or the urinary system resulting in the type of tuberculosis known as extra pulmonary tuberculosis. TB is not spread through sharing of food, drink, cloths, kissing, or shaking of hands. Each person with open pulmonary tuberculosis will infect on average between ten (10) and fifteen (15) people each year and about five to ten percent of people who are infected become sick during their lifetime.

There are two TB related conditions, latent TB infection and active TB infection. The TB bacteria can live in the body of an infected person without making the person sick and does not have any symptoms because the body is able to fight the bacteria to stop growing. This is called Latent TB infection. People with latent TB infection are not infectious and cannot spread TB bacteria to others. However, if TB bacteria become active in the body and multiply, where the immune system cannot stop it from growing, the person will go from having latent TB infection to Active TB. People with active TB are sick and can spread the bacteria to people.

People most susceptible or at greater risk of contracting the disease are people with weak hormone system, patients with HIV/AIDS, diabetes, smokers, elderly, patient with organ transplantation, alcoholics and drug uses. Addition risk factor is when people are exposed to frequent, prolong and close contact with persons with active TB.

The first symptoms of active TB are poor appetite, weight loss, cough accompanied by bloody spectrum, fever, night sweat, chest pains, fatigue, and shortness of breath. TB can be diagnosed with a simple skin test or Tuberculin test, chest radiography (X-ray), or Blood in Sputum (sputum culture) can be used. TB is treatable and curable, once diagnose, it can be addressed through a series of specific antibiotics. Standard anti-tuberculosis drugs are about 95% effective when prescribed and taken correctly for several months. However, owing to the side-effects of the drugs and their high cost, patients do not always complete the full course of treatment. Early treatment stands a chance of overcoming TB. Treatment can last several months. Even if one feels better, there is no reason to stop treatment until completed as prescribed by the doctor. Failure to treatment can cause the micro bacterium to become resistant to antibiotics, making TB more aggressive and dangerous, a condition known as drug resistance TB.

To prevent spread of tuberculosis, one must maintain good nutrition and take a lot of fluid to stay well hydrated, attend regular health checkup, avoid staying for long period of time at crowded places, when you cough or sneeze cover your nose and mouth with your hand or tissue. Also use face mask when possible. Another method to prevent tuberculosis is the use of a vaccine called bacilli calmette glerin (BCG), mostly for children and it's the mostly used vaccine worldwide.

In Ghana, tuberculosis is among the first ten killer diseases in the country and about 289 people out of 100,000 are infected with the disease. The incidence of TB in Ghana has risen dramatically in the last decade, currently there are about 30,000 TB cases each year and 15000 people die of the disease. Ghana is not among world health organization's high burden countries for TB, yet the disease is a major health problem in the country. Ghana is ranks 13th in Africa for the highest estimated number of new cases per year.

There have been several interventions and preventive measures for TB control. However, it still continues to be one of the leading causes of mobility and mortality in the under developed world. A study conducted by the UN agency in Kenya depicts that there was a decline in TB case detection from 57% in 1996 to 43% in 2005. The WHO CIDA initiative reported that, 20,000 people developed active TB in 2011 of which majority were not detected and treated. Also, a study conducted in the Amansie central district in Ghana shows that an estimated number of 71.7% of nurses do not include TB screening services as part of their home visits activities, and, hence, this development can lead to low TB case detection (Afoakwa& Taylor, 2018). However, a study conducted by Amenuvegbe, Francis &Binka, (2016) greater part of the people who present with productive cough for two weeks and above at the OPD are mostly not tested for TB and made to go home (Amenuvegbe et al, 2016). This is, however, not different in the West Akim municipality. In 2015, 61 TB cases were seen as against a target of 81, in 2016, 64 against 105 and in 2017 56 TB cases was seen with a given target of 116, showing 75% 60% and 48% rates for the years respectively (West Akim Annual report, 2016). These statistics show that many TB cases are missed and suspected cases are also not reported to the health facilities for diagnosis and treatment.

Due to these problems associated with tuberculosis, this research has a keen interest into assessing factors that contribute to the low cases detection rate of TB among health workers and community members in the West Akim Municipality of the eastern region of Ghana.

1.1 Research Questions

The aim of this study seeks to delve into the following questions.

1. What are the health care related factors influencing low tuberculosis case detection in the West Akim Municipality?
2. What are the community related factors contributing to low tuberculosis case detection in the West Akim Municipality?

1.2 Scope of Study

Well-structured questionnaire for this study was administered to health care officers, community members and target focus persons within the West Akim Municipality. The Municipality is divided into 10 sub municipalities: the Asamankese sub municipal, Amanfrom sub municipal, Osenase sub municipal, Brekumanso, Blue Diamond Akanteng, Aworasa, Ekoso Quashie, sabon-Zongo and Pabi respectively. All respondents of the study were from these 10 sub municipalities of the West Akim Municipality. The study used community members which also included suspected people with TB, as well as friends and relatives of people living with TB who reside in the various communities selected as respondents of the questionnaire. It also involves health workers (physicians, physician assistants, nurses, community health nurses, enrolled nurses, midwives, as well as laboratory personnel who work within the selected health facilities in the West Akim Municipality. The study also included TB focal persons within the Municipality.

Poor TB case detection leads to increased transmission and high TB prevalence rate as each active case has the capacity to infect 10-15 persons per year. This study will provide information which will serve as a guide to ensure that all patients who experience prolonged cough (two weeks or more) will be screened for TB to help address the setbacks to low TB case detections. Findings from the study will also provide information on TB case detection in the West Akim Municipality. Overall, this work will serve as a basis for planning and decision making on this contagious disease that continues to afflict people although it remains a curable disease.

2. Material and Methods

2.1 Data Collection Technique

A well-structured questionnaire will be used to collect data on respondents. Data from the field will be checked by the principal investigator before entry. Epi data version 4.0.2 will be used to create the database template for questionnaire and also for the entry. Data will then be exported to Microsoft Excel and finally transferred to SPSS version 24 for the analysis. The Statistical packages to be used for the research analysis is SPSS and for all statistical tests, were two sided and an alpha level of P-value less than 0.05 are considered statistically significant. The 95 % confidence intervals were also used where appropriate. The results will be presented in graphs and tables.

The descriptive analysis includes the use of statistical technique, charts (line graphs), percentage, and averages to determine the empirical justification for utilizing the specified statistical technique for data analysis. It also included finding the mean, standard deviation, range of scores, skewness and kurtosis of the continuous variables.

There are a number of assumptions common to all the techniques. These assumptions must be considered when performing any of the analyses using the techniques. (Levels of Measurement, Independence of Observations, Normal Distribution, Homogeneity of Variance).

2.2 Likert Scale and Reliability Test

Based on the item-response theory in identifying items that made maximal discrimination of respondents and literatures' reviews about stigma scales, the nine-item stigma questionnaire was developed, taking into consideration the social and cultural backgrounds that exist in Ghana. The items were rated on the five-point Likert scale ranging from 1 to 5 (strongly disagree/disagree/neutral/agree/strongly agree), respectively. The obtained total scores ranged from 9 to 45. As comparison, stigma levels were categorized according to the same definition. High stigma level was defined if the summed score was more than the median score of 27. Qi, Xu, Zhou et al. (2014).

The reliability and validity of the scale will be validated using the Cronbach's α and the corrected item-total correlations. Both scales must show good internal consistency, and the unidimensional constructed validity in measurement. The reliability of a scale indicates how free it is from random error. With values range from (0 to 1), with higher values indicating greater reliability, If the Cronbach's alpha value is above 0.7, then the scale can be considered reliable with our sample.

2.3 One-way analysis of variance (ANOVA)

One-way analysis of variance is similar to a t-test, but is used when you have two or more groups and you wish to compare their mean scores on a continuous variable. It is called one-way because you are looking at the impact of only one independent variable on your dependent variable.

A one-way analysis of variance (ANOVA) will let you know whether your groups differ, but it won't tell you where the significant difference is (group1/group3, group2/gp3 etc.).

Assumption (Levene's Test of Equality of Error Variances)

To test for one of the assumptions underlying analysis of variance. The study run the Levene's Test of Equality of Error Variances.

The table of results gives you information about each group (number in each group, means, standard deviation, minimum and maximum, etc.)

- Test of homogeneity of variances

The homogeneity of variance option gives you Levene's test for homogeneity of variances, which tests whether the variance in scores is the same for each of the three groups.

Null hypothesis: the variances are equal.

Against an alternate hypothesis: the variances are not equal

Check the significance value (Sig.) for Levene's test from the Levene's table. If this number is greater than .05 (e.g. .08, .12, .28), then you have not violated the assumption of homogeneity of variance.

If you have found that you violated this assumption you will need to consult the table in the output headed Robust Tests of Equality of Means. The two tests shown there (Welsh and Brown-Forsythe) are preferable when the assumption of the homogeneity of variance is violated.

- ANOVA

The table gives both between-groups and within-groups sums of squares, degrees of freedom etc. If the Sig. value is less than or equal to .05 (e.g. .03, .01, .001), then there is a significant difference somewhere among the mean scores on your dependent variable for the three groups. This does not tell you which group is different from which another group.

The statistical significance of the differences between each pair of groups is provided in the table labelled Multiple Comparisons, which gives the results of the post-hoc tests.

The posthoc tests in this table will tell you exactly where the differences among the groups occur. Check the significance value (Sig.). If the Sig. value is less than or equal to .05 (e.g. .03, .01, .001) within the groups, then there is a significant difference within these groups. Thus, only group 1 and group 3 are statistically significantly different from one another. That is, the 18–29 age group and the 45+ age group differ significantly in terms of their time of diagnostics scores.

2.4 Two-Way analysis of variance (ANOVA)

In order to find out if there is a difference between males and females across different age groups in terms of experienced stigma score, the study needs to run a two-way ANOVA. Then we will be able answer a question, if there is a difference in experienced stigma score for males and females in different age groups.

Assumption (Levene's Test of Equality of Error Variances)

To test for one of the assumptions underlying analysis of variance. The study run the Levene's Test of Equality of Error Variances. If the significant value is greater than .05, means that it is not significant and thus the variance of dependent variable across the groups is are equal. And if the variances are equal, then we can conclude that we have not violated the homogeneity of variances assumption.

Main Output from Two-Way ANOVA (Tests of Between-Subjects Effects)

Interaction Effects

This is to check for the possibility of an interaction effect (e.g. that the influence of age on experienced stigma score depends on whether you are a male or a female).

ANOVA is a table labelled Tests of Between-Subjects Effects. we need to look at the label AGE*SEX. To find out whether the interaction is significant, check the Sig. column for that line. If the value is less than or equal to .05 (e.g. .03, .01, .001), then there is a significant interaction effect. However, if the Sig. value is greater than 0.5, then this indicates that there is no significant difference in the effect of age on experienced stigma for males and females.

If from the ANOVA results, we know that any of our independent variables (age groups or sex) differ. For instance, if age groups differ, we do not know where these differences occur: Is group1 different from group2, is group2 different from group3, is group1 different from group3? To investigate these questions, we need to conduct post-hoc tests. Post-hoc tests are relevant only if you have more than two levels (groups) to your independent variable. The results of the post-hoc tests are provided in the table labelled Multiple Comparisons. We have requested the Tukey Honestly Significant Difference test, as this is one of the more commonly used tests. Look down the column labelled Sig. for any values less than .05, then there is a significant difference within these groups.

2.5 Chi-square test

The chi-square test for independence is used to determine whether two categorical variables are related. It compares the frequency of cases found in the various categories of one variable across the different categories of another variable.

In order to determine if there is a relationship between the different age groups and awareness of TB, to find out if youth or middle age respondents are more likely to be aware of TB than old age and vice versa, the study had to run a chi-square test for independence.

Assumptions

From the chi-square test, the first thing you should check is whether you have violated one of the assumptions of chi-square concerning the 'minimum expected cell frequency', which should be 5 or greater (or at least 80 per cent of cells have expected frequencies of 5 or more). This information is given in a footnote below the final table (labelled Chi-Square Tests). For example: Footnote b in table provided indicates that '0 cells (.0%) have expected count less than 5'. This means that we have not violated the assumption, as all our expected cell sizes are greater than 5 (in our example case greater than 35.87).

Reporting/Interpretation of output of chi-square test

The test statistic, as we've seen, is denoted by χ^2 . The output tells us that the value of χ^2 was 25.36, There was a significant association between the two variables as $\chi^2(1) = 25.36, p < .001$.

The main value that you are interested in from the output is the Pearson chi-square value.

Also, if you have a 2 by 2 table (i.e. each variable has only two categories), then you should use the value in the second row (Continuity Correction). If for example, the corrected value is .337, with an associated significance level of .56 (this is presented in the column labelled Asymp. Sig.(2-sided). To be significant the Sig. value needs to be .05 or smaller. In this case the value of .56 is larger than the alpha value of .05, so we can conclude that our result is not significant. This means that the proportion of males that are aware of TB is not significantly different from the proportion of females that are aware of TB.

phi and Cramer's V

In the case where both of your variables have only two categories (resulting in a 2 by 2 table), some writers suggest that it may be more appropriate to use the phi coefficient to describe the relationship between the variables. Phi can be requested using the same procedure as that used to obtain chi-square. Phi and Cramer's V ranges from 0 to 1 and provides an indication of the strength of the relationship or association between the variables. With a Cramer's statistic is 0.11, 0.36 and 0.89 out of a possible maximum value of 1. This represents a low, medium and high association respectively between two variables. These results will confirm what the chi-square test has already told us but also give us some idea of the size of effect.

3. Results and Discussion

3.1 Community Members

Data consist of three hundred and twenty-two, 322 community members, of which two hundred, 200 are exactly suspected people with TB and friends or relatives of people living with TB.

The 322 respondents (community members) involved in the study were taken from 9 sub-districts in the West Akim municipality and 10 communities in all within the municipality. The age distribution shows that the respondents have a mean age of 35.45, ranging from age 18 to 60, with a standard deviation of 9.5.

The male and female respondents are of almost equal number with 157 males representing 48.8 % and 165 females representing 51.2 % in the sample, giving a total of 322 respondents.

The various ages were grouped into three, 3 categories, consisting of youth (18 to 29), middle age (30 to 44) and old age (45+). middle age has the highest number of respondents, 158 representing 49.1%, followed by the youth, 100 respondents representing 31.1% and old age with the least number of 64 respondents representing 19.9%.

Frequency distribution across various demographic information about the respondents were taken. This includes the level of education, marital status, occupation, religion, ethnicity and residential area of the respondents.

3.1.1 Knowledge on TB by Community Members

Various knowledge-based questions on TB were administered to the respondents to find out how informed they are on TB, some of the variables on the knowledge base include, causes of TB, mode of transmission of TB, signs and symptoms of TB, TB treatment options available, cost of TB treatment, among others. Results show that the respondent's knowledge on the cause of TB is very low with over half of the respondents choosing spirituality (a wrong answer) as a cause of TB. A total of 299 (92%), a massive majority of the respondents knowing the right mode of transmission for TB. A massive majority of 306 (95%) of the respondents also know the right signs and symptoms of TB. (Table 1)

202 (62.7%) of respondents say that hospital is the right place to go when you suspect TB. However, a total of 120 (37.3), over one third (1/3) of the respondents know and chose alternative means of seeking for health care (herbalist and prayer camp) when one has TB. Similarly, the study captured a total of 199 (36.9%), over one third (1/3) of the respondents knowing and choosing alternative means of medication (herbs and prayers) to be used in the treatment of TB away from TB drugs. (Table 1)

Even though with the use of the health insurance card, people assume it is free to seek treatment while insurance caters for the real bill, in the case of TB treatment, the whole treatment process is free, so the notion of without health insurance card, you can't seek for TB treatment is wrong. This means that a majority of the respondents (60.9 %) don't know the right cost of TB treatment. (Table 1)

3.1.2 Causes of TB

The study showed that when it comes to wrong response on the causes of TB (spirituality, germs and virus), more females answered wrongly than males. And with the right response on the cause of TB (bacteria), more males answered correctly than females.

3.1.3 TB treatment options available

The study showed that both males and females chose drugs as the highest choice of medication that should be used in the treatment of TB. Also, almost equal number of males and females chose herbs and prayers as alternative treatment options available for the treatment of TB. Due to this perception, there are also alternative facilities people visit, such as the prayer camps and herbal centres/herbalist apart from the hospital. (Figure 1)

3.1.4 Cost of TB treatment

Among the majority (60.9%) of the respondents who think that insurance is used to pay for the cost of TB treatment, the females are more than the males by almost 5%. This means that more females are misinformed than males. However, when it comes to the right choice (free) as the cost of treatment, the males are more than the females.

3.1.5 Awareness of TB

A massive majority (84.78%), over four fifth (4/5) of the respondents are aware of TB, they have heard of TB, and know that TB is a disease that affect humans. The rest (15.22%) of the respondents says they are not aware or have not heard of TB.

3.1.6 Awareness of TB Across Gender (The Chi-Square Test)

From the chi-square table, (table 2) the test statistic, $\chi^2(1) = 1.626, p < .05$. The value in the second row (Continuity Correction) is 1.255, with an associated significance level of 0.263. To be significant, the Sig. value needs to be .05 or smaller. In this case the value of 0.263 is larger than the alpha value of .05, so we can conclude that our result is not significant and this means that the proportion of males that are aware of TB is not significantly different from the proportion of females that are aware of TB. Therefore, males are not likely to be aware of TB than females. (Table 2)

From the (phi and Cramer's V test) table 3, with a Phi and Cramer's V statistic of 0.071 out of a possible maximum value of 1. This represents a low association between the two variables. These results confirm what the chi-square test has already told us but also give us some idea of the size of effect. (no significantly different in the proportion of males and females on the awareness of TB. (Table 3)

3.1.7 Awareness of TB Across Age Groups (The Chi-Square Test)

From the chi-square table 4, the test statistic, $\chi^2(2) = 5.775, p < .05$, with an associated significance level of 0.056. To be significant, the Sig. value needs to be .05 or smaller. In this case the value of 0.056 is larger than the alpha value of .05, so we can conclude that our result is not significant and this means that the proportion of youth or middle age respondents aware of TB is not significantly different from the proportion of old age respondents that are aware of TB and vice versa. Therefore, youth are not likely to be aware of TB than middle age or old age and middle age are not likely to be aware of TB than youth and old age respondents. (Table 4)

From the (phi and Cramer's V test), table 5 with a Phi and Cramer's V statistic of 0.134 out of a possible maximum value of 1. This represents a low association between the two variables. These results confirm what the chi-square test has already told us but also give us some idea of the size of effect. (no significant different in the proportion of youth, middle and old age respondents on the awareness of TB. (Table 5)

3.1.8 Time of TB diagnostics (Days)

The study found out how long it takes for respondents to get tested and how long it takes for respondents to receive their results (time of diagnostics). The results recorded a mean time of diagnostics score as 41.80, and the times ranging from 8 to 60 hours. The time of diagnostics score was grouped into three, 3 categories, consisting of one day (0 to 24), two days (>24 to 48) and three days (>48 to 60). A higher number of respondents 131 (40.7%), saying it takes two days to get diagnosed. Followed by 104 (32.3%) of respondents saying it takes one day to get diagnosed. Three, 3 days has the least number of respondents 87 representing 27%.

3.1.9 Experienced Stigma

Reliability Test (Scale: All Variable items)

The study used Cronbach's alpha coefficient as an indicator of internal consistency. This is done to find out the reliability of the scales used on the variable from the questionnaire. The Cronbach's alpha value is 0.873. this value is above 0.7, hence the scale can be considered reliable with our sample. (Table 6)

Experienced stigma was conceptualized as individual experiences from treatment by community members, neighbors, health workers and friends in daily life since their suspected case of TB was identified or confirmed. The results show a mean stigma score of 29.89, ranging from 9 to 45 hours, with a median stigma of 33 and a standard deviation of 7.628. It also shows a skewness value of -0.857, a negative skewness values indicate negative skew (scores clustered to the right at the low values). Clustered right values indicate high stigma scores.

Categorizing Experienced Stigma Scores

The various stigma scores were grouped into two, 2 categories, consisting of high-level stigma and low-level stigma. High stigma level was defined if the summed score for a respondent was more than the median score of 27 and a low-level stigma, if the summed score was equal to 27 or less. Qi, Xu, Zhou et al. (2014). High stigma level has the highest number of respondents, 137 representing 68.5%, while 63 respondents representing 31.5% experience low stigma levels. This means that over two-thirds (2/3) of the respondents feel they experience high levels of stigma while a little below one third (1/3) of the respondents experience low levels of stigma. (Figure 2)

Experienced stigma was taken according to the sex of the respondents. There were 98 males representing 49% and 102 females representing 51 % in the sample, giving a total of 200 respondents. Both males and females have high stigma level than low stigma level. A bar chart also shows that when it comes to high stigma levels, males are more stigmatized than females by just one respondent. When it comes to low stigma levels, females are more stigmatized than males by 3%.

However, Using the Chi square test to find out if there is a relationship between gender and experienced stigma level, The Chi square test statistic, $\chi^2 (1) = 0.324, p < .05$. The value in the second row (Continuity Correction) is 0.174, with an associated significance level of 0.677. In this case the value of 0.677 is larger than the alpha value of .05, so we can conclude that our result is not significant, there is no significant difference in the proportion of males and females with regards to experienced stigma levels, (high and low stigma levels). Therefore, males are not likely to experience high or low stigma levels than females. (Table 7)

Also, the same Chi square test was run to find out if the different age group of respondents are more likely to be experience different stigma levels than each other. the results show a test statistic, $\chi^2 (2) = 0.683, p < .05$, with an associated significance level of 0.711. In this case the value of 0.711 is larger than the alpha value of .05, so we can conclude that there is no significant difference in the proportion of youth, middle and old age respondents across the different experienced stigma levels. Therefore, youth are not likely to experience high or low stigma level than middle age or old age. And middle age is not likely to experience high or low stigma levels than youth or middle age.

3.2 Health Workers

Data consists of responses of the questionnaire administered to eighty-one (81) health workers (community health nurses, enrolled nurses, laboratory technician, among others) and personal interview granted to three (3) TB focal persons all within the 9 sub-districts and 10 communities in the West Akim Municipality.

The age distribution shows that the respondents have a mean age of 27.88, ranging from age 20 to 55, with a median age of 28 and a standard deviation of 5.033. There is a vast difference in the sex distribution of the health workers. There were 25 males involved, representing 30.9% of the sample and 56 females representing 69.1%. the females are twice the number of male health workers involved in the study.

Frequency distribution of the clinical categories of the various health workers from which the data was collected. 50 of the health workers were community health nurses, 13 of them were laboratory technicians, 11 of them were enrolled nurses. Registered general nurse were the least with 7 of them.

3.2.1 Knowledge on TB by Health Workers

Various knowledge-based question on TB were administered the respondents (health workers) to be informed about some operations and practices that are performed by the health workers or goes on in the health facilities.

Responses on TB suspect indicates that, all health workers, 81 (100%) agree that both males and females can be suspected for TB. This means all health workers made the right choice on who to suspect for TB. (Table 8)

Responses on where to suspect TB revealed that health workers are prepared to suspect TB at everywhere, they are and not only in the health facility. (Table 8)

Responses on what specimen is used for TB diagnostics shows that a massive majority of 74 (91.4%) of the health workers says sputum is the specimen to be taken when you have to test for TB. Seven 7 of the health workers disagree with this notion, thereby five 5 of them (6.2%) saying that blood is the specimen to use and two 2 of them (2.5%) choosing stool at the specimen for TB diagnostics. A massive majority knows the right specimen to be used in the diagnostics of TB. (Table 8)

Health workers also considers everyone especially HIV patients to be the people likely to contract TB.

When it comes to the response on the first TB lab test to be conducted, there was a huge division in choice with almost equal choices across all the alternatives. 34 (42%) of the health workers chose AFB. Followed by 27 (33.3%) saying that Gene Xpert is the first TB lab test. TB culture had the least number of choice form health worker with 20 (24.7%) choosing it. (Table 8)

3.2.2 TB Related Activities of Health Care Workers

Various questions on some TB related activities were asked of the respondents to be informed about some operations and practices that are performed by the health workers or goes on in the health facilities.

TB algorithm is the resource that provide a procedural content on the diagnostics of TB. finding out how many health workers have or follow or use this algorithm in their health facility A massive majority of 67 (82.7%) of health workers have the algorithm for use. Only 14 (17.3) of the health workers says they have no idea of the presence of an algorithm in their health facility. (Table 9)

TB education is an integral part of health education which must the included in the health talks by health facilities in the health programs. Results shows that 22 (27.2%) almost one third (1/3) of the health workers say they do not include TB education in their health talks program. (Table 9)

Since not all health facilities have laboratory for TB diagnostics, the study asked the health worker if they receive referral cases from other health facilities concerning TB cases. Question on TB referral cases indicates that 64 (79%) of the health workers admit that they receive referrals on TB cases. (Table 9)

Prayer camps top the list of possible places where referral cases may come from with 32 (39%) of respondents choosing it as a referral point. This is followed by TB referral cases from the community or homes with 19 (23.5%) of the health workers choosing it. 17 (21%) of the health workers chose the prison as a point for referral cases. Private clinics was assessed as the least point that brings out TB referral cases with 13 (16%) of health workers choosing it. This is perhaps as a result of the fact that most of the private health sectors have their own laboratories for the diagnostics of TB. Results also proves or through more light on the opinion which community members shared that prayer camps are alternative health seeking options available when one suspects TB, and for that matter, prayer camp was chosen to be the highest point to receive TB referral cases. (Table 9)

A special questionnaire was administered to only community health nurses within the clinician category to find out whether they include TB screening as part of their home visitation program. Out of the possible 51 community health nurses, 31 of them representing 60.8 % include TB screening as part of their home visitation while 20 of them (39.2), thus over one third (1/3) of the community health nurses do not include TB screening as part of their home visitation program. This is not a good result since those who did not include this for several periods will fail to capture people that will have passed the screening test to further go on for TB diagnostics at the health centres.

3.2.3 Availability of TB Related Resources for Health Workers at their Facility (By TB Focal Persons)

This section of the research was conducted through interview with TB focal persons in the West Akim Municipality. The study required to find out the availability of some TB related resources within the nine 9 health facilities in the West Akim municipality.

Results show that, two third (2/3) of the health facilities have no trained TB personnel and that there are four 4 trained TB personnel within 3 of the health facilities leaving six 6 of the health facilities without a trained TB personnel. (Table 10)

Only one 1 out of the nine 9 health facilities has a Gene Xpert Machine, meaning there are 8 facilities representing 88.9 % of the sample are not having a Gene Xpert machine for the diagnostics of TB. One facility indicated that it has to send specimen to Asamankese Government hospital in order to use the Gene Xpert machine. One facility indicated that it has to send specimen to Asamankese Government hospital in order to use the Gene Xpert machine.

Also, there is only one 1 health facility having a DOTS centre among the nine 9 health facilities of the sample. The remaining eight of the health facilities do not have DOTS centres. (Table 10)

4. Conclusion

4.1 Community Related Factors

The study captured that respondents knowing and choosing alternative means of medication (herbs and prayers) to be used in the treatment of TB, keep them away from using TB drugs. Some respondents said that, TB patients who seek traditional healing had been treated and cured of TB completely and in some cases partially. They also admitted that, just like in biomedicine, some suspected TB patients who went for traditional healing did not receive complete cure.

They were of the view that some of the patients require treatment for a shorter time using the herbs from traditional healers than in biomedicine.

These respondents said that most TB patients sought help from traditional healers when they suspect that they have TB. Hence the availability of alternative means of health care (traditional healers, prayer camps, and herbs to manage suspected cases of TB whether wrongly or rightfully turns to keep people away from the health facilities.

The lack of community members willingness to get tested for TB after they have passed screening test, and given referral to get tested at the health facility but prefers to seek for traditional healing or prayer camps and also to use herbs and prayers as medication influences low TB case detection at the health facilities.

The lack of willingness of the community members to have their TB status checked. The fact that a high proportion of those who had their status checked before misinformed community members of how long it takes for an individual to get tested and how long it takes receive his/her tested results (time of diagnostics), also taking into consideration the distance from the persons house to the health facility. It turns out that most of these people feel that it takes a long time to get diagnosed of TB (over today's), compared to other sickness such as malaria. Which in itself a wrong comparison to do. This affected their willingness to have themselves availed to be tested for TB infection. And hence leads to low TB case detection in the municipality.

Having TB, the disease itself already impose a psychological burden on suspected TB patients. This study also found out that, there is high stigmatization (individuals' experiences from attitudes and behaviors of the surrounding neighbors in the community) among community members and this experienced stigma is associated with the psychological distress on the TB patients. There is no significant difference in this high level of stigmatization among males and females across different age groups. Due to this massive stigma on suspected people with TB and on friends and relatives living with TB patients, others within the community who are supposed to be screened and go for TB test refuse to do so due to the fear of being stigmatized, hence there is low detection of TB due to low turnout for screening and testing. It is quite understandable that the degree of stigmatization within the community had make suspected patients worried and frustrated, and this could result in distress and fear. This could deter others from seeking medical help when they really need to. The study also found that, TB stigma even existed among health care providers against suspected patients. This negatively influence the health seeking behavior among suspected patients. Once being diagnosed with TB, patients with the label could experience various stigma from the surroundings in daily life.

Results revealed that, responses to some questions imply the low knowledge of TB among community members. Some respondents are not aware of what TB is. Majority of the respondent's knowledge on the cause of TB is very low. Also, most of the respondents (60.9 %) don't know the right cost of TB treatment. These three low knowledge base factors among respondents on TB can hinder their willingness to access the health center to be screened, tested and treated for TB and that can influence low detection of TB cases within the municipality.

4.2 Health Related Factors

With Low TB trained personals and low TB education during health talks in creating awareness that TB is preventable, curable and treatable and that suspected people with TB (cough for more than two weeks) should seek medical attention, there is low knowledge of TB among community members and hence turnout for screening and testing of TB are low within the municipality which will automatically lead to low detection of TB cases

This current study has revealed that over one third (1/3) of the community health nurses do not include TB screening as part of their home visitation program. This is not a good result since those who did not include this for several periods will fail to capture people that will have passed the screening test to further go on for TB diagnostics at the health centres. This low level of contact tracing could also contribute to the low case detection rate.

The availability and distribution of Gene Xpert machine and DOTS centre across the municipality was found to be highly inadequate since only 1 out of the 9 health facilities involved in the study has a Gene Xpert machine and also a DOTS centre. Some of these health centres do not also have laboratories for the diagnostics of TB. Moreover, this single diagnostic centres with the Gene Xpert machine and the DOTS centre is located far from some communities. Patients from other locations in the district needing quiet laboratory test using the Gene Xpert machine and those to use the DOTS centre had to travel long distances to the diagnostics centres for TB testing and later come back for the results. Travelling long distances from difficult- to-reach communities for the results could be a serious challenge and may lead to primary high defaulting and low case detection in that district.

4.3 Policy Implementation and Recommendations

The following recommendations are made in order to enhance effective TB case detection techniques and to increase TB case detection.

Measure must be taken by stake holders of the Ghana health service and the Ghana national TB control Programme for provide a lot of TB trained personals within the municipality so that various health facilities will have TB trained personals at their disposal, they will also help to boost the TB education within that health facility to the community members.

Stakeholders of the Ghana health service and the Ghana national TB control Programme must also provide and make available the new and modern Gene Xpert machine to most health facilities within the municipality to aid them the diagnostics of TB. This will massively reduce time of diagnostics from 2 days to 3 or 4 hours. This will encourage people to go for testing of TB, since they won't have any problem with spending so much time in the process.

Experienced stigma was associated with the low detection of TB, which implied the necessities of reducing TB related stigma through intervention studies about attitude or behavior changes of everyone in public, and self-efficiency in patients. Basically, in order to increase low TB case detection and TB control for public health management, measures must be put in place to remove barriers of stigma surrounding TB.

The health directorate and the health workers must be mandated to include TB education in their health talk programs to educate the public that TB is treatable and curable once diagnosed. The education must also cover the issue on the best alternative health care to seek when it comes to TB, so that people will stay away from the traditional herbalist and the prayer camps and instead visit the hospital and clinics for testing of TB.

Community health nurses adhere to the contact tracing strategy from the national TB program. They must make sure that the TB screening process is included in the home visitation program in order to capture a lot of community members under the potential people for TB detection.

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Appendix

Community Members

Table 1. Knowledge on TB by Community Members

Knowledge on TB by Community Members		Count	Sub table Total N %
Causes of TB	Germs	27	8.4%
	Virus	17	5.3%
	Bacteria	100	31.1%
	Spiritual	178	55.3%
	Don't Know	0	0.0%
	Total	322	100.0%
Mode of TB Transmission	Blood	1	0.3%
	Close contact with Infected Person	253	78.6%
	Air Borne	46	14.3%
	Sexual Intercourse	22	6.8%
	Total	322	100.0%
Signs and Symptoms of TB	Cough	246	76.4%
	Chest Pain	60	18.6%
	Fever	16	5.0%
	Total	322	100.0%
Awareness of TB Treatment	Yes	202	62.7%
	No	120	37.3%
	Total	322	100.0%
Where does one goes to when he/she suspects TB	Hospital	202	62.7%
	Prayer Camp	38	11.8%
	Herbalist	82	25.5%

	Total	322	100.0%
TB Treatments Options available	Drugs	203	63.0%
	Herbs	86	26.7%
	Prayers	33	10.2%
	Total	322	100.0%
Cost of TB treatment	Free	35	10.9%
	Insurance	196	60.9%
	Don't Know	91	28.3%
	Total	322	100.0%
Have you ever been screened for TB	Yes	101	31.4%
	No	221	68.6%
	Total	322	100.0%

Table 2. Chi-Square Test (Sex * Awareness of TB)

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	1.626 ^a	1	.202		
Continuity Correction ^b	1.255	1	.263		
Likelihood Ratio	1.629	1	.202		
Fisher's Exact Test				.217	.131
Linear-by-Linear Association	1.621	1	.203		
N of Valid Cases	322				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 23.89.

b. Computed only for a 2x2 table

Table 3. Cramer's V and Phi test (Sex * Awareness of TB)

Symmetric Measures			
		Value	Approximate Significance
Nominal by Nominal	Phi	.071	.202
	Cramer's V	.071	.202
N of Valid Cases		322	

Table 4. Chi-Square Test (Age Group * Awareness of TB)

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	5.775 ^a	2	.056
Likelihood Ratio	5.789	2	.055
Linear-by-Linear Association	5.669	1	.017
N of Valid Cases		322	

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 23.85.

Table 5. Cramer's V and Phi test (Age Group * Awareness of TB)

Symmetric Measures			
		Value	Approximate Significance
Nominal by Nominal	Phi	.134	.056
	Cramer's V	.134	.056
N of Valid Cases		322	

Table 6. Test of Reliability

Reliability Statistics	
Cronbach's Alpha	N of Items
.873	9

Table 7. Chi-Square Test (Sex * Experienced Stigma Level)

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.324 ^a	1	.569		
Continuity Correction ^b	.174	1	.677		
Likelihood Ratio	.325	1	.569		
Fisher's Exact Test				.648	.338
Linear-by-Linear Association	.323	1	.570		
N of Valid Cases	200				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 30.87.

b. Computed only for a 2x2 table

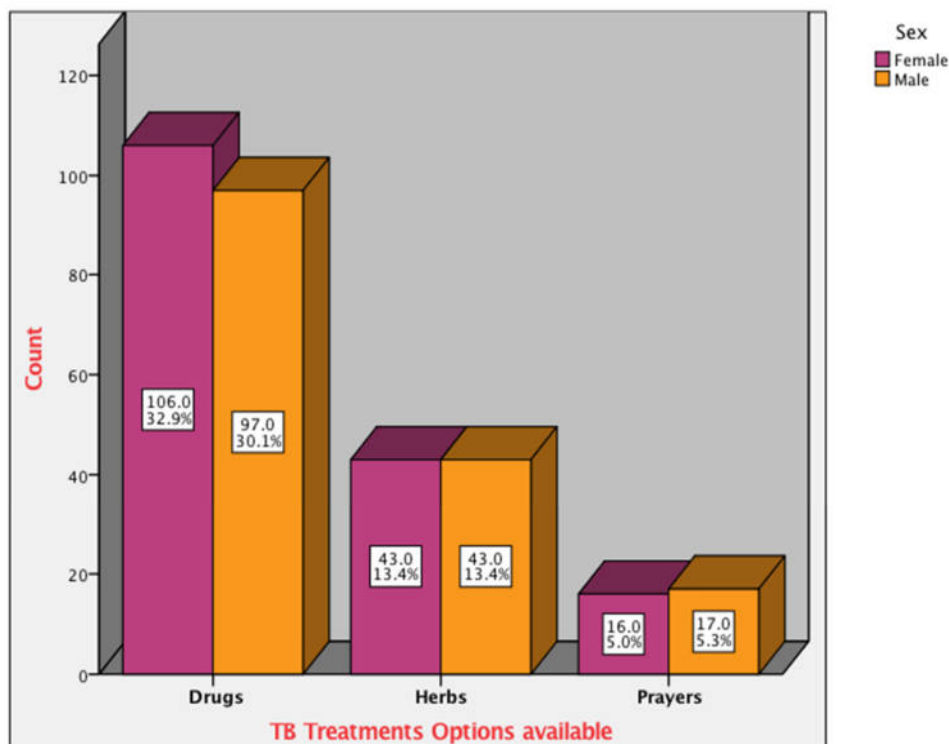


Figure 1. Clustered Bar Chart showing distribution of TB treatments available

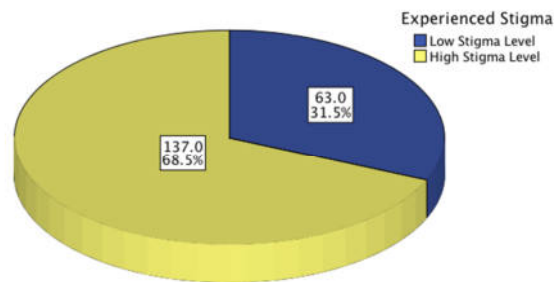


Figure 2. Pie Chart showing Stigma level distribution

Health Workers

Table 8. Knowledge on TB by Health Workers

Knowledge on TB by Health Workers		Count	Sub table Total N %
TB Suspect	Male	0	0.0%
	Female	0	0.0%
	Both	81	100.0%
Where to Suspect TB	Lab	0	0.0%
	Ward	10	12.3%
	Anywhere	71	87.7%
	OPD	0	0.0%
Specimen for TB Diagnostics	Blood	5	6.2%
	Sputum	74	91.4%
	Stool	2	2.5%
	Saliva	0	0.0%
Likely to contract TB	HIV Patients	17	21.0%
	Anyone	47	58.0%
	Adults	16	19.8%
	Children	1	1.2%
First TB lab Test	AFB	34	42.0%
	Gene Xpert	27	33.3%
	TB Culture	20	24.7%

Table 9. TB Related Activities of Health Care Workers

TB Related Activities		Count	Sub table Total N %
TB Algorithm Available	Yes	67	82.7%
	No	14	17.3%
	Total	81	100.0%
TB Education in Health Talks	Yes	59	72.8%
	No	22	27.2%
	Total	81	100.0%
TB Referral Cases	Yes	64	79.0%
	No	17	21.0%
	Total	81	100.0%
Where Referrals comes from	Prayer Camps	32	39.5%
	Private Clinics	13	16.0%
	Community/Homes	19	23.5%
	Prison	17	21.0%
	Total	81	100.0%

Table 10. Availability of TB Related Resources

	Trained TB Personnel	Gene Xpert Machine Available	TB DOTS Centre Available
Yes	33.3%	11.1%	11.1%
	3	1	1
No	66.7%	88.9%	88.9%
	6	8	8

Interview Guide for Data Collection

This Stigma Questionnaire

Questionnaire to be administered to suspected people with tb or friends and relatives living with tb patients in the West Akim municipality

1. The local residents are unwilling to chat or have a talk with TB patients
2. Many residents keep their distance from TB patients
3. The neighbors will treat the TB patients differently once they get the news
4. Many people walk away from facing TB patients
5. My family members feel that they have lost face after knowing my illness with TB
6. Local residents will not let their kids come close to TB patients
7. People will not have dinner together with relatives or friends of TB patients
8. TB patients are not welcome by their local villagers or community residents
9. I think it is no good to inform the others of my suspected TB infection.