# Patients Understanding of their Tuberculosis (TB) Medications and their Awareness of Lifestyle Modifications for Post TB Living

Ibrahim Ibn Saana[1*], Daniel N.A. Ankrah[2], Philip k. Amoo[3], Kissinger Marfoh[3], Francis A. Akum[4], Richard Achiak[3], Idrissu A. Yahaya[5], Farida N. Abdulai[6]

[1]*Department of Pharmacy, Chest Diseases, Korle Bu Teaching Hospital, Ghana*
[2]*Department of Pharmacy, Korle Bu Teaching Hospital, Ghana*
[3]*Department of Public Health, Korle Bu Teaching Hospital, Ghana*
[4]*Department of Orthopaedics/PT, Bawku Presbyterian Hospital, Ghana*
[5]*Department of Internal Medicine, Chest Clinic Tamale Teaching Hospital, Ghana*
[6]*Ghana Health Service, Greater Accra Region, Ghana*

## Abstract

*Medicine's availability, understanding their administration and radiational use are critical in drug therapeutic outcomes. Advancement in science has led to understanding of the etiology of several disease conditions, yet challenges remain due to patients' non-adherence to prescribed treatment (14). The purpose of this study was to assess patient's knowledge and understanding of their TB medications and their awareness of lifestyle modifications to adapt for post TB living. The study also assessed common factors affecting TB patients. A descriptive cross-sectional study was carried out. The study population consisted of 250 diagnosed TB patients attending the Clinic who were systematically selected. An Interviewer administered questionnaire with REDCAP was used to collect data, organized using Excel spreadsheet software and analysed using Statistical Package for Social Sciences (SPSS). Logistic regression was used to establish significance. Results: 63.2% (n=158) were males and 36.8% (n=92) were females with a 100% response rate. 62.8% (n=157) have pulmonary TB, 35.2% (n=88) Extra PTB whiles 2.0% (n=5) MDR-TB. 9.2% (n=23) of patients are aware that TB could reduce their sexual function. Only 20.4% (n=51) knew their medications and 2.7% (n=18) aware of lifestyle changes to adapt post treatment for an improved Quality of Life. 86.4% (n=216) out of the 250 patients received immediate care. Logistic regression showed that Odds ratio at 95% confident interval of the potential predictors were insignificant except age and marital status. Since less than 50% knew their medicines and lifestyle changes to adapt pharmacists and prescribers need to improve on patient education and counselling.*

*Keywords: Cost, Diagnosis, Knowledge, Medications, Therapy.*

## Introduction

Tuberculosis is a contagious bacterial disease caused by Mycobacterium tuberculosis. TB mostly attacks the lungs (pulmonary TB), but it can affect any organ in the body (extra Pulmonary TB). TB that affects other parts of the body is not as infectious as TB of the lungs. Pulmonary TB is transmitted from a sick TB patient as a droplet infection through coughing, singing, and sneezing [1]. Inhalation of these droplets by an uninfected person may cause infection. The risk of contracting TB increases with the frequency and duration of contact with people who have the disease [2].

A person who visits a hospital or clinic with symptoms of the disease is sent to the laboratory to do a sputum test. A sputum sample is taken and examined with a GeneXpert, and the result

*Corresponding Author: abugraogo@gmail.com*

is ready in two hours. If the patient is positive, he is counseled and commences treatment as soon as possible [3]. In order to prevent loss to follow up during treatment, home visits are done, and family members are counseled to serve as treatment supporters. Household members, including children under 5 years of age living in a smear-positive patient household, are screened for TB. If they are positive, they are put on treatment; if they are negative, they are put on Isoniazid preventive therapy (IPT) [4].

One-third of the world's population is infected with tuberculosis (TB), with nearly 2 million deaths occurring each year [5]. More than 1.5 million occur in Sub-Saharan Africa are among those infected annually. About 46,000 cases are reported in health facilities in Ghana yearly [6], but the treatment of the disease had been erratic since 1900 until the introduction of TB services in 1959.

Many infected people apply for both homeopathic and allopathic medicines as treatment since 1900, but the World Health Organization has recommended medicines for treatment [7].

TB Preventive Therapy (TPT) is the administration of one or more anti-tuberculous drugs to individuals with latent TB infection to prevent progression to active disease [8]. WHO recommends the use of Isoniazid for 6 months in resource-limited settings for the prevention of TB in at risk populations living in high TB incidence, prevalence and transmission settings. The use of Isoniazid is one of the ways in which active TB disease is prevented among at-risk populations in high TB incidence settings [9].

Ghana adopted DOTS strategy in national TB control program (NTP) during fourth population & health plan (1992–1998) and integrated into essential service package under the health and populations sector program (HPSP) in 1998[10]. Although initially TB services were based in TB clinics and TB hospitals, under the DOTS strategy the services were expanded gradually to primary level of health facility incorporating GO-NGO partnership. Government and NGO

community health workers are involved in village level for case detection and awareness building activities. In 2002, DOTS was expanded to major city. By 2006 entire country has been covered by DOTS service [11]. The DOTS strategy relies greatly on passive case finding for TB treatment and its success depends on the patient's health awareness, ability to recognize early sign symptoms, and accessibility to health services for immediate self-reporting [12]. It is important that basic knowledge about the disease and the availability of treatment is clear among community to prevent any undue delay in availing the service. The perceptions of TB prevailing in the community influence the health seeking behavior of people for their symptoms. While care seeking behavior of chest symptomatic has been explored in different studies, there is dearth of information on community perceptions of TB [13]. The current study was done to determine patients understanding of their TB medications and their awareness of lifestyle modifications for post TB living. Medicine's availability and their rational use of plays critical roles in determining drug therapeutic outcomes. Despite the advancement in science and technology which has led to a greater understanding of their pathophysiology and etiology of a number of diseases, prescribers do not achieve the desired therapeutic outcome due to patient non-adherence or partial adherence towards prescribed treatment regimen (14).This study sought to assess patient's knowledge and understanding of their TB medications dispensed from the Chest Clinic Pharmacy and their awareness of the lifestyle changes to adapt for an improved quality of life after treatment , to determine the determine the lag time between TB diagnosis and initiation of antiknocks treatment and to asses patients are awareness of the potential of a reduced sexual function due to TB. Patients who clearly understand their healthcare information have better health outcomes, increased patient satisfaction and fewer hospitalizations (15).

## Methods

A descriptive cross-sectional study was carried out. The study population consisted of all diagnosed tuberculosis patients attending the department of chest diseases of the Korle bu Teaching Hospital. A patient attending the Chest Clinic for the management of tuberculosis during the study period was considered as the study unit. Patients who were under the age of twelve [12] years, patients who were not seen at the chest clinic and filled their medications with the Korle Bu Teaching hospital were not included.

Two hundred and fifty (250) patients with TB were identified as participants for this study. Systematic sampling was adopted as the sampling method where every third (3rd) TB patient identified from the daily clinic attendance register was selected. An Interviewer administered questionnaire design with REDCAP was used to collect the data. The questionnaire was designed after a thorough literature survey and the studies carried out in Ghana and other countries. Inputs from some programme managers, clinicians treating the TB patients were also taken into consideration.

Discussions were carried out by the Principal Investigator (PI) with patients to determine the real social and lifestyle issues that can occur as a result of the disease itself. The questionnaire was reviewed by a panel of experts consisting public health professionals, respiratory physicians, sociologist and a social worker.

The pre testing of the questionnaire was carried out among ten patients at the Chest Clinic in department of chest diseases, Korle Bu Teaching Hospital.

## Inclusion Criteria

All TB patients who attended the Chest Clinic and aged 13 years or above were selected for this study.

## Exclusion Criteria

All TB patients below the age of 13 years were excluded.

## Data Collection

Data collection was carried out for a period of eight weeks, starting from 1st October 2020 to 26th November 2020. Potential participants chosen from the daily clinic attendance register were approached by the PI. Informed written consent was obtained prior to data collection. Interviews were carried out in a separate location within the clinic, which did not disturb the routine clinic proceedings.

## Statistical Analysis

Data analysis was carried out by using the SPSS 25.0 statistical package. Descriptive data were presented as frequencies in tables. Using the Logistic Regression method, we assessed potential factors associated with Knowledge and understanding of TB medications as well as lifestyle modifications for post TB living.

We included information on age, gender, religion, marital status, education, employment status as possible predictors. These variables were selected based on a review of the literature and on our hypothesis. The results have been presented as Odds Ratios (OR) with 95% confidence interval (95% CI). Ethical clearance was obtained from the Ethics Review Committee of the Hospital.

## Results

The study included 250 subjects with a response rate of 100%. In this study 63.2% (n= 158) were males and the rest (36.8%; n = 92) were females. The mean age was 42 years (SD = +/- 14.3) and the median age was 49 years. Of the total sample size of 250, majority of the respondents were between 19-39 years 44.0% (n=110) and 60 above years 11.2% (28). 24.8% (n=62) were found to be single, while 69.6% (n=174) were married. About 10.4% of the respondent had basic education. 19.6% (n=49), 18.4% (n=46), 47.6% (n=119), and 14.4% (n=36) of the study subjects identified themselves as unemployed, self-employed, employed and students respectively. Regarding

the religion, most of them were Christian 86.8% (n=217) followed by Muslim 12.8% (n=36).

More than half of the participants were diagnosed of pulmonary tuberculosis (PTB) 62.8% (n=157) 35.2% (n=88) with regard to dsthe Extra Pulmonary site, MDR TB recorded only 2.0% (n=5) out of the 250 patients. 84.0% (n=210) were put immediately on treatment while some 14.0% (n=35) and 2.0% (n=5) delayed for less than one month and one month or more due to some reasons.

The socio-demographic characteristics of the study population are described in Table 1.

**Table 1.** Socio-demographic Characteristics of Tb Patients

| Variables | N=250 |
|---|---|
| **Sex** | |
| Male | 63.2% (158) |
| Female | 36.8% (92) |
| **Age** | |
| Less than 18 | 2.8% (7) |
| 19 – 39 | 44% (110) |
| 40 – 59 | 42% (105) |
| 60 + | 11.2% (28) |
| **Marital status** | |
| Married | 69.6% (174) |
| Single | 24.8% (62) |
| Divorced | 3.6% (9) |
| Widowed | 2.0% (5) |
| **Employment status** | |
| Employed | 47.6% (119) |
| Unemployed | 19.6% (49) |
| Student | 14.4% (36) |
| Self employed | 18.4% (46) |
| **Educational level** | |
| Basic | 10.4% (26) |
| Secondary | 68% (170) |
| Tertiary | 20.8% (52) |
| No education | 0.8% (2) |
| **Religious background** | |
| Christianity | 86.8% (217) |
| Islam | 12.8% (32) |
| **Type of Tb** | |
| Pulmonary Tb | 62.8% (157) |
| Extra Pulmonary Tb | 35.2% (88) |
| MDR-Tb | 2% (5) |
| **Days delayed to start treatment** | |
| Without delay | 84% (210) |
| Less than 1 month | 14% (35) |
| 1 month and more | 2.0% (5) |

## Understanding of Tb Medications and Lifestyle Modification

Patients' knowledge and understanding on their TB medications, as well as their awareness of lifestyle modification for post TB living, was assessed, and out of the 250 patients, only 4.0% (n=10) agree that they know the names of their Tb medications. 92.4% (n=231) know how to take these TB medications, and 87.6% (n=219) know how long they are supposed to take the medication. When asked about side effects, only 18.8% (n=47) said they are aware, and 20.8% (n=52) also said they were of the precautions these medications came with. 12.8% (n=32) said they understand drug resistance.

Only 2.8% (n=7) out of the 250 understand breathing exercise, 10.8% (n=27) understand that they may realign to their work after diagnoses, and 9.2% (n=23) knows and understand that their sexual function could reduce following the diagnose of TB. The characteristics of knowledge, understanding, and lifestyle changes is presented in Table 2.

**Table 2.** Characteristics of Knowledge, Understanding, and Lifestyle Modifications

| Variables | N=250 |
|---|---|
| **Knows name(s) of Tb Medications** | |
| Yes | 4% (10) |
| No | 96% (240) |
| **Knows how to take Tb medications** | |
| Yes | 92.4% (231) |
| No | 7.6% (19) |
| **Knows duration of Tb medications** | |
| Yes | 87.6% (219) |
| No | 12.4% (31) |
| **Knows side effect of Tb medications** | |
| Yes | 18.8% (47) |
| No | 81.2% (203) |
| **Knows precaution of Tb medications** | |
| Yes | 20.8% (52) |
| No | 79.2% (198) |
| **Understands Tb drug resistance** | |
| Yes | 12.8% (32) |
| No | 87.2% (218) |
| **Knows and understands breathing exercise** | |
| Yes | 2.8% (7) |
| No | 97.2% (243) |
| **Understands he/she may realign work** | |
| Yes | 10.8% (27) |
| No | 89.2% (223) |
| **Understand post Tb relationship** | |
| Yes | 5.6% (14) |
| No | 94.4% (236) |
| **Knows Tb could reduce sexual function** | |
| Yes | 9.2% (23) |
| No | 90.8% (227) |

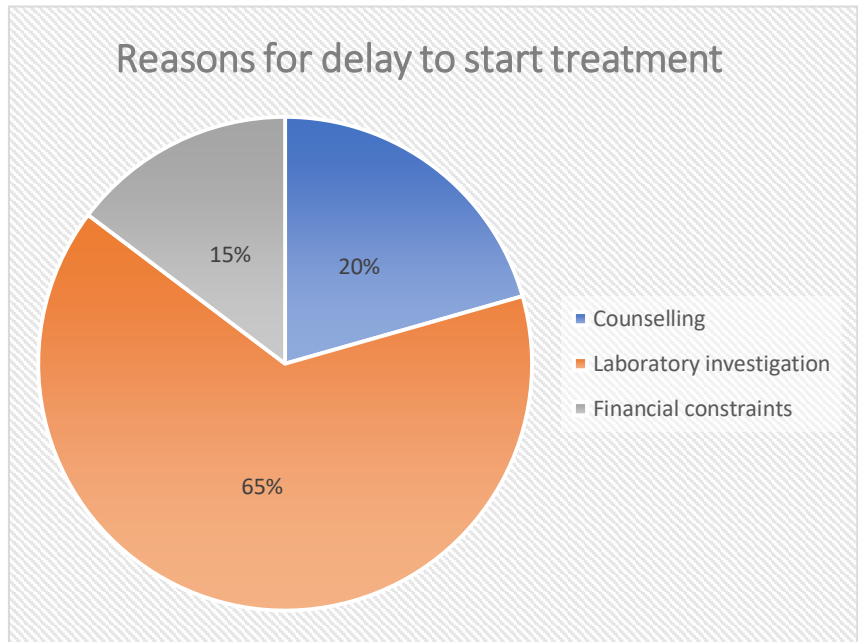| Aware covering mouth helps reduce Tb | |
|---|---|
| Yes | 75.6% (189) |
| No | 24.4% (61) |
| **Knows name of any accompanying drug** | |
| Yes | 11.2% (28) |
| No | 88.8% (222) |



**Figure 1.** Reasons why Patients Delay to Start Treatment after Diagnoses

The pie chart above shows the number of TB patients who delayed the start of their treatment. The following reasons were recorded. Out of the 250 patients, 216 of them started the treatment without delay. 20.0% (7) delayed due to counseling, 15.0% (5) delayed due to financial constraints, and 65.0% (22) delayed due to laboratory investigations.
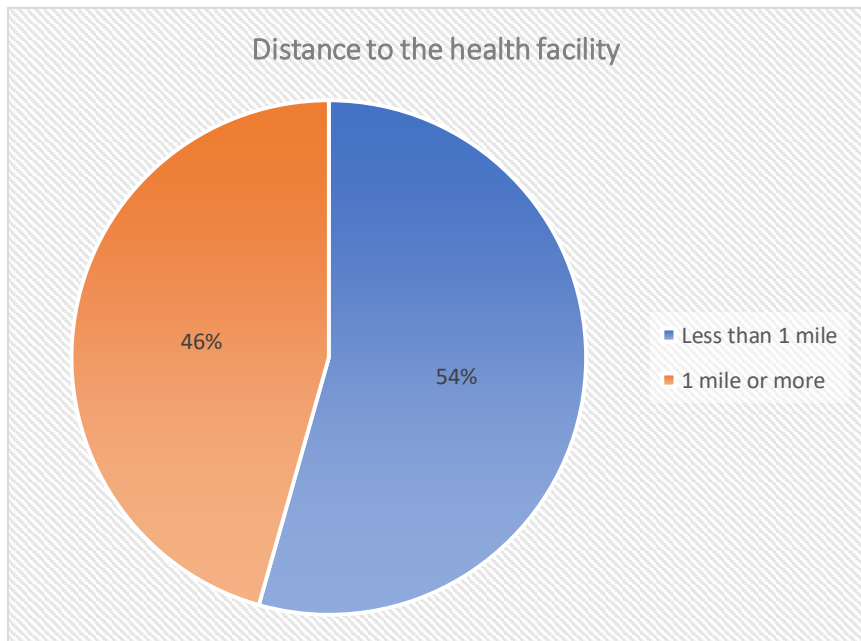


**Figure 2.** Location Distance of Patient to the Health Facility

The investigator also wants to know how long it will take a patient to get to the health facility and this is presented by the pie chart above. He found out that 54.0% (124) of the patients reside not more than one mile from the health facility, and 46.0% (104) resides a distance of one mile or more. 22 of the patients' distances could not be determined.
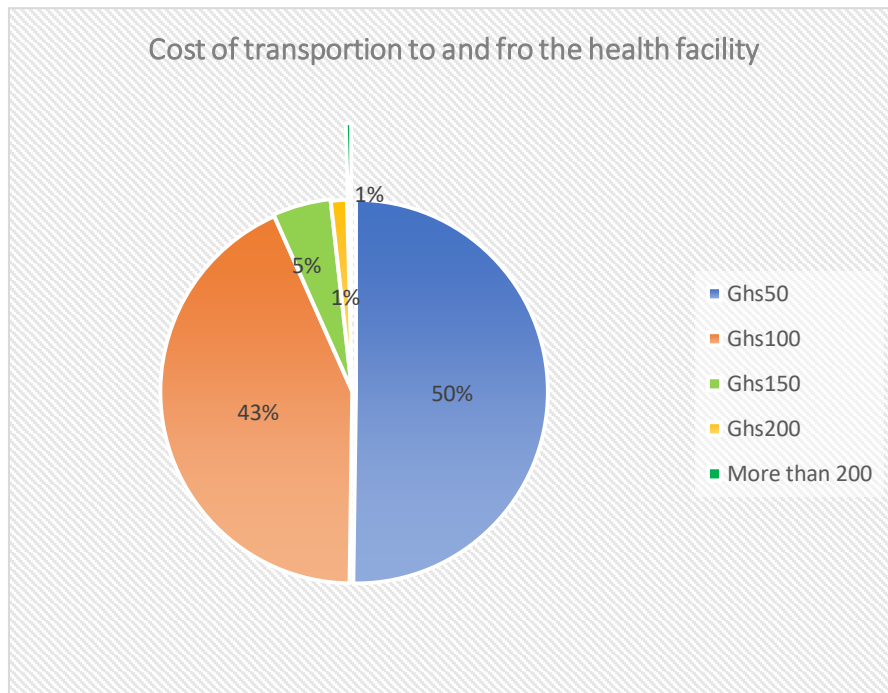


**Figure 3.** Financial Cost of Transportation of Patient

In terms of cost to and from the hospital, 50.0% (113) said they spend around 50 cedis, 43.0% (97) said they spend around 100 cedis, and only 5.0% (11) spend up to 150 cedis as shown in the pie chart above.

## Knowledge and Understanding of Tb Medications

There was a 100% response to questions as to whether patients know the names of their medications, knows how to take the medication, know duration of medication, knows the side effects of medication. Knows precautions of medication, understands drug resistance, and knows the name of any accompanying drug.

In all seven questions were asked, the variables were recomputed into a single variable 20.4% (n=51) out of 250 patients said they had knowledge and understanding of their TB medication, and logistic regression analysis performed to determine the odds ratio at 95% confidence interval of the potential predictors such as sex, age, marital status, employment status, educational level, and religion. Most of the predictors were insignificant except age and marital status, which show some level of significance.

The predictor age shows significancy at 60 years and above vs. those who were less or equal to 18 years with an odds ratio of 4.5 and p-value of 0.052, respectively. This can be interpreted as patients 18 years and below are almost 5 times higher in knowledge and understanding in their TB medication than patients 60 years and above.

When it comes to marital status, married patients were about 70% increase in knowledge and understanding of their TB medication compared to singles. Table 3 shows the logistic regression of odds ratio at 95% CI below.

**Table 3.** Logistic Regression Analysis of Odds Ratio (OR) Knowledge and Understanding of TB Medication in Relation to Potential Predictors, (n = 250)

| Characteristics | OR | 95% CI | P-value |
|---|---|---|---|
| **Sex** | | | |
| Female vs Male | 1.5 | (0.68 - 3.21) | 0.319 |
| **Age** | | | |
| 19 - 39 vs <= 18 | | | 0.999 |
| 40 - 59 vs <= 18 | 1.9 | (0.39 - 9.38) | 0.422 |
| 60+ vs <=18 | 4.5 | (0.99 - 20.31) | 0.052 |
| **Marital status** | | | |
| Single vs married | 0.7 | (0.01 - 0.72) | 0.025 |
| Divorced vs married | 0.3 | (0.03 - 3.43) | 0.334 |
| Widowed vs married | 0.4 | (0.03 - 5.88) | 0.501 |
| **Employment status** | | | |
| Unemployed vs Employed | 0.9 | (0.33 - 2.68) | 0.897 |
| Student vs Employed | 2.4 | (0.70 - 8.07) | 0.163 |
| Self-employed vs Employed | 0.4 | (0.07 - 1.94) | 0.244 |
| **Educational level** | | | |
| Secondary vs Basic | 0.3 | (0.01 - 7.23) | 0.431 |
| Tertiary vs Basic | 0.5 | (0.02 - 11.28) | 0.670 |
| No Education vs Basic | 1.1 | (0.05 -25.11) | 0.953 |
| **Religious background** | | | |
| Islam vs Christianity | | | 1.000 |
| Others vs Christianity | | | 1.000 |

## Lifestyle Modification for post TB Patients

Variables such as patients knowing how to take breathing exercise, realign to their work, relationship with others, sexual function, and covering their mouth to reduce the spread of TB were also recomputed into a single variable. Only 7.2% (n=18) out of 250 patients agreed that they are aware of lifestyle changes that will occur, and logistic regression was used to determine the odds ratio (OR) at 95% confidence interval, and none of the predictors were significant. P > 0.05 was obtained from all predictors for this variable.

**Table 4.** Logistic Regression Analysis of Odds Ratio (OR) for Lifestyle Modification in Relation to Potential Predictors, (n = 250)

| Characteristics | OR | 95% CI | P-value |
|---|---|---|---|
| **Sex** | | | |
| Female vs Male | 2.2 | (0.48 - 10.20) | 0.305 |
| **Age** | | | |
| 19 - 39 vs <= 18 | 0.5 | | 1.000 |
| 40 - 59 vs <= 18 | 0.5 | (0.05 - 4.41) | 0.507 |
| 60+ vs <=18 | 1.5 | (0.24 - 9.72) | 0.650 |
| **Marital status** | | | |
| Single vs married | 0.2 | (0.02 - 2.09) | 0.172 |

| | | | |
|---|---|---|---|
| Divorced vs married | 0.2 | (0.01 - 3.92) | 0.284 |
| Widowed vs married | 0.9 | (0.05 - 15.95) | 0.918 |
| **Employment status** | | | |
| Unemployed vs Employed | 0.6 | (0.08 - 4.07) | 0.582 |
| Student vs Employed | 3.3 | (0.60 - 18.28) | 0.171 |
| Self-employed vs Employed | | | 0.998 |
| **Educational level** | | | |
| Secondary vs Basic | | | 0.999 |
| Tertiary vs Basic | | | 0.999 |
| No Education vs Basic | | | 0.999 |
| **Religious background** | | | |
| Islam vs Christianity | | | 1.000 |
| Others vs Christianity | | | 1.000 |

## Discussions

Modification of lifestyle is a complex concept, which is influenced by various internal and external factors [16]. Lifestyle change has not been explored much among TB patients, and studies done on this concept in Ghana have been rare. Nevertheless, it is necessary to explore these lifestyle aspects in the local context, considering underlying various socio-economic and cultural backgrounds. Studies would help in developing tailor-made public health interventions and strategies for preventing lifestyle impacts among TB patients in Ghana.

The study assessed the understanding of TB medications and lifestyle modification of TB patients attending the Chest Clinic, Korle Bu Teaching Hospital. A descriptive cross-sectional study was conducted to achieve this objective, and the data generated is useful for healthcare policy-makers in determining the impact of lifestyle changes among TB patients due to their disease status as a public health problem.

When medical treatment is complicated or lasts for a long time, as in the treatment for TB disease, patients often do not take their medication as instructed [17]. This behavior is one of the biggest problems in TB control and can lead to serious consequences. A nonadherent patient with TB disease may remain sick longer or have a more severe illness, spread TB to others, develop and spread drug-resistant TB or even die as the result of interrupted treatment.

It is also important that persons with latent TB infection (LTBI) who have prescribed a regimen for LTBI had knowledge and understanding to the regimen. Completion of therapy for LTBI can prevent people with TB infection from developing TB disease [18].

As part of patient education, health care workers should explain the importance of why people with TB disease need to take their medicine. Health care workers should explain how adhering to TB treatment can be good for the patient and for others. For example, adhering to therapy can help a patient feel better sooner, cure their TB, and help them return to normal activities. Likewise, a patient's adherence to therapy can prevent the further spread of TB to family, friends, coworkers, and the general public and can prevent the development and spread of multidrug-resistant TB [19].

The total study sample consisted of 63.2% (n= 158) males and (36.8%; n = 92) females with mean age of 42 years. Ages between 19 -39 years 44% (n=115) were the majority follow closely by 40-59 years 42% (n=105) and the least was those 18 years and below 2.8% (n=7) respectively.[20] proves that the disease is associated with the male sex.

In the present study, 10.4% of the patients had only basic education,0.8% no education, and

68% with some secondary education. Shetty et al. in their case-control study, have identified low education level as an important determinant of TB.[21] reported that education up to grade 8 or below had a significant association with pulmonary TB.

Tuberculosis can have an effect on employment status, as some will lose their jobs due to work realignment, and some stopped their work voluntarily. In our study, the majority of the participants, 47.6% were still in employment, 19.6% were unemployed, and 14.4% were students.[22] stated that 31% had to stop their work purely due to the disease, and the average duration of work absenteeism was 48 days. People working in the state sector are entitled to special leave but not in the private sector. Ideally, paid leave should be granted until the patient is not infected. Adjustments within the workplace could be arranged to suit the patient's needs. However, the study revealed that job security was threatened in some participants. The influence of the job has directly affected the income not only at the individual level but also at the family level. This is most relevant when the victim is the breadwinner of the family.

Although there were many lifestyle changes within the family environment, interestingly, there was no significant association between the marital status and the negative lifestyle changes. Social interactions of the patients have changed purely due to the disease. The most common reason to avoid social gatherings was the patients" belief that he/ she was not healthier enough to behave as usual [23]. The causes of the stigma associated with TB studied in Ghana have identified the following factors: fear of infection with TB by others, outdated social beliefs and practices, physical inability, blaming and shaming, association with HIV, and self-stigmatization by TB patients [24].

It was also found out that most patients, 86.8% were of the Christian religion and 12.8% Islam. This was not surprising as Ghana is made up of almost 80% Christianity.

## Limitations of the Study

Some data variables from the study unit were incomplete in the TB registry.

## Conclusion

Only 20.4% (n=51) had knowledge of their medications, while only 2.7% (n=18) being aware of lifestyle changes to adapt post-treatment for an improved Quality of Life.

Written information should match the patient's reading level, and health care workers should give instructions orally and leave visual cues or reminders, such as a snapshot of each medication.

Logistic regression indicated that the Odds ratio at 95% confident interval of the potential predictors was insignificant except age and marital status, which showed some level of significance. 86.4% (n=216) out of the 250 patients started treatment without delay. The results also revealed that 62.8% of them have pulmonary TB, 35.2% (n=88) had Extrapulmonary TB while 2.0% (n=5) have MDR-TB with 9.2% (n=23) patients being aware that they cloud experience a reduced sexual functionality due to TB. The results also indicated that 43.0% (n=97) spent a hundred Ghana Cedis and above as cost to access treat to and from the hospital.

## Acknowledgement

## Conflict of Interest

Ibrahim Ibn Saana, Daniel N.A. Ankrah, Philip k. Amoo, Kissinger Marfoh, Francis A. Akum, Richard Achiak, Idrissu A. Yahaya, Farida N. Abdulai, declare that we have no conflict of interest.

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