

# Perceptions of erectile dysfunction among male tuberculosis patients in Ghana

(a case cross-sectional study)

<sup>1</sup>Ibrahim Ibn Saana, <sup>2</sup>Daniel N.A. Ankrah, <sup>3</sup>Isaiah Sagoe, <sup>4</sup>Patrick Adjei, <sup>5</sup>Kissinger Marfo

<sup>1</sup> B.Pharm. MPH, Ph.D., *MPSGH* <sup>2</sup> B. Pharm, M.Sc., Ph.D., Postdoc, FPCPharm, <sup>3</sup> B.Sc., MBCHB, Ph.D., FWACP, B. <sup>4</sup>Pharm, *MPSGH*, <sup>5</sup>B.Sc., MBCHB, M.sc

<sup>1</sup>Department of Pharmacy, Korle Bu Teaching Hospital, Ghana

<sup>2</sup>Department of Pharmacy, Korle Bu Teaching Hospital, Ghana

<sup>3</sup>Department of Pharmacy, Korle Bu Teaching Hospital, Ghana

<sup>4</sup>Department of Medicine, Korle Bu Teaching Hospital & University of Ghana Medical School, Ghana

<sup>5</sup>Department of Public Health, Korle Bu Teaching Hospital, Ghana

## Abstract

Perception of Erectile Dysfunction (ED) among patients can impact negatively medication adherence and worsen sexual performance. This study sought to assess the perceptions of erectile dysfunction among male tuberculosis patients in Ghana. The study also assessed other factors associated with TB patients. A descriptive cross-sectional study was carried out. 115 diagnosed TB patients attending Chest Clinic Pharmacy, Korle Bu Teaching Hospital were randomly selected. An interviewer administered modified international index of erectile dysfunction (IIEF-5) questionnaires used to collect data which was organized using Excel software and analyzed using Statistical Package for Social Sciences (SPSS) version 21. Patients' demographic data i.e., Gene X-pert results, x-rays, and sputum smear microscopy were evaluated. Results: Only 78 patients responded. The types of TB were pulmonary 84.6% (n=66) & extra pulmonary 15.4% (n=12), only 21.1% had the perception that TB medications could cause Erectile Dysfunction. Patients with pulmonary TB 84.6% (n=66) had a prevalence of ED 59.9% compared with extra-pulmonary TB 15.4% (n=12). 79.5% (n=62.0) were moderately sure that TB could cause their sexual function. Over 80% have the perception that the causative factor of ED was TB. A higher number of TB patients 92.3% (n=71) had poor medication adherence. The mean age was 40-49 group while the majority of them were among the ≥50 plus age group. A chi-square test indicated that age had a correlation with the perception of ED (L.R. P=0.001<0.05). The majority, thus, 62% of the patients experienced various degrees of ED. Perception has a negative impact on health outcomes and adherence; pharmacists and healthcare givers must intensify patient counseling and drug education campaigns

**Keywords:** *Erectile Dysfunction, Tuberculosis, Medications, perception*

## Introduction

This research explores ways of reducing the stigma associated with TB and patients' perception of erectile dysfunction which impacts negatively on drug adherence as well as their general well-being. Discussing Erectile dysfunction (ED) among patients can be quite difficult and embarrassing due to the social stigma attached to it. In view of the fact that Erectile dysfunction is considered a possible cause of low self-esteem, depressive symptoms, and psychological trauma leading to noncompliance to treatment regimen and health outcomes. It is currently believed that there are multiple causes of the erectile dysfunction which can be categorized into psychological, environmental as well as sociological. It is a widespread phenomenon and due to socio-cultural norms, it is often considered taboo to talk about. It is considered to have a high rate of prevalence rate within the general population which was found to vary from 27% to 86% [1]. Studying erectile dysfunction among men has been found to be difficult due to specific cultural influences that make it more difficult for them to admit to having it [2]. The Prevalence of erectile dysfunction among populations and its wide variance is usually attributed to its embarrassment as a subject and the difficulties involved in establishing a definition and diagnosis for it. In another study involving a healthy New England population, it was found that 52% of men aged between forty and seventy years of age had "impotence" to some degree of erectile dysfunction [3]. In a study that sought to investigate the prevalence and type of sexual dysfunction (SD) in 300 healthy sexually active Ghanaian men of fertile age, the presence of general sexual dysfunction including erectile dysfunction was found to be very high and it was related to age [4]. In yet another study that sought to investigate the prevalence and type of sexual disorders among 200 married couples, the prevalence of sexual dysfunction in married couples was found to be comparable to prevalence rates in the general male and female population and is further worsened by the duration of marriage [5]. Erectile dysfunction was found to impact significantly a couple's self-esteem and their overall quality of life. In another study that sought to assess the sexual Quality of Life (QoL) of individuals and their partners involving 130 and 116 diabetic males and females and their partners, it was revealed that male partners of diabetic females who have a higher perception of IELT had a reduced sexual quality of Life due to aging and longer duration of Diabetes [6]. A quantum of terminologies terms has been used interchangeably to describe erectile dysfunction and very often, the impotence is implied when

discussing a myriad of male sexual dysfunctions; premature ejaculation, retrograde ejaculation, loss of libido, and performance anxiety; all of which have different causes which can be as a result of pathophysiological or psychogenic processes, and as a result differing treatment [7]. According to Copland's Medical Dictionary of 1858, there are four subtypes of erectile dysfunction. (i) Organic due to hypogonadism (ii) Functional as a result of excessive or premature sexual indulgence and smoking (iii) Moral or mental impotence due to psychological causes such as fear of incapacity, of not being loved, timidity, shame, disgust, hatred, jealousy, suspense, terror, etc. (iv) Constitutional impotence inherited genetically [8] This definition was complex and used many descriptors, which practitioners and men alike found problematic. [7]. Erectile Dysfunction has been defined as the inability to achieve an erection that is adequate enough for intercourse to the mutual satisfaction of both partners [9]. Psychogenic ED is found to be caused by a variety of psychosocial factors which do not necessarily result in pathological changes but may impact the psychological components of sexual behaviors and therefore can manifest as ED [11]. Organic erectile dysfunction is thought to be caused by a disease process, or pathological causes, which affect the somatic elements required to achieve an erection [8]. The process of achieving an erection requires neurological, vascular, and hormonal processes to be intact; therefore, any disease process which causes damage to any of these can result in erectile dysfunction [13]. Tuberculosis has been thought to cause erectile dysfunction among pulmonary TB patients most of which is caused by perception. Perception is also influenced by behaviors and intern adherence to medication. This study was therefore set out to address this perception. This study sought to assess the perception of Erectile dysfunction (ED) among male TB patients who take their TB medications from the Chest Clinic Pharmacy, to determine the relationship between patient's perception of erectile dysfunction and they are sociodemographic and determine the relationship between patient's perception of erectile dysfunction and their medication adherence. It was also to determine the sub-TB types among the patients, to determine whether patients think their perception of ED is due to antituberculous medication or TB disease or, to assess the role of other factors that may cause erectile dysfunction in the male Tuberculosis patients, to determine the prevalence rate of erectile dysfunction among the study population and to propose remedies for policymakers that would help minimize erectile dysfunction among male tuberculosis patients

**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. One hundred and fifteen (115) patients with TB were identified as participants in this study. A random sampling method was adopted where every TB patient identified from the daily clinic attendance register has an equal chance of being selected. An Interviewer administered a modified international index of erectile function (IIEF-5) questionnaire designed with REDCAP was used to collect data. The questionnaire was designed after a thorough literature survey and studies carried out in Ghana and other countries. Inputs from some program managers and clinicians treating TB patients were also taken into consideration. Discussions were carried out by the Principal Investigator (PI) with patients to determine issues such as perception on of the disease, ED, and medications. The questionnaire was reviewed by a panel of experts consisting of public health professionals, respiratory physicians, sociologists, and social workers. The pre-testing of the questionnaire was carried out among ten patients at chest diseases, Korle Bu Teaching Hospital.

**Inclusion Criteria.** All male TB patients who attended the Chest Clinic and were aged 16 years or above were selected for this study. **Exclusion Criteria.** Patients who were under the age of sixteen [16] years, females, and patients who were not seen at the chest clinic and filled their medications with the Korle Bu Teaching hospital were not included.

**Data Collection:** Data collection was carried out for a period of twelve weeks, starting from 1<sup>st</sup> March 2021 to 31<sup>st</sup> May 2021. 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 without disturbance to the routine clinic proceeding

**Statistical Analysis:** Data analysis was carried out by using the SPSS 25.0 statistical package. Descriptive data were presented as frequencies in tables, bar charts, and pie charts. Using the Logistic Regression method, we assessed potential factors associated with Erectile Dysfunction, Tuberculosis, and TB medication adherence. We included information on age, gender, religion, marital status, education, and 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 frequency tables, bar charts, and pie charts with a 95 % confidence interval (95% CI). Ethical clearance was obtained from the Ethics Review Committee of the Hospital.

**Ethical considerations:** Ethical Clearance was sought from the Institutional Review Board of the Korle Bu Teaching Hospital.

**Results:** The study involved 115 subjects with a response rate of 67.83% (78). In this study 100% (n= 78) were all males and (0%) females. The mean age was 40-49 years age group and the median age was 49 years. Of the total sample size of 78, the majority of the respondents were above 50 years and above. 36.4% (n=28) were found to be single, while 48.7% (n=38) were married. About 25.64% (n=20) of the respondents had basic education, 51.28% (n=40) had secondary education and 17.95% (14) had tertiary education respectively., 18.4% (n=46) of the study subjects identified themselves as unemployed, 47.6% (n=119) were either self-employed or employed, and 14.4% (n=36) of the study subjects were students respectively. Regarding religion, most of them were Christian, 55.13% (n=43) followed by Muslim, 44.87% (n=35). Majority of the participants, 84.6% (n=66) were diagnosed of pulmonary tuberculosis (PTB) while 15.4% (n=12) had Extrapulmonary TB (XPTB). With regard to TB-subtypes, 69.2% had plural Effusion, 17.9% had disseminated kochs, 3.8% (pericardial effusion and TB meningitis), Lymphadenopathy (2.8%), Abdominal TB and cerebral (1.3%). The prevalence of the proportion of Tuberculosis patients having erectile dysfunction was 62.3%. Over 80% have the perception that the causative factor of ED was TB. A Chi-square test indicated that medication adherence had an association (LR;  $p=0.03 < 0.05$ ) with the perception of erectile dysfunction. A higher number of TB patients 92.3% (n=71) had poor medication

adherence. Age also had an association with the perception of ED (L.R.  $P=0.001 < 0.0$ ). The majority, thus 62% of the patients experienced various degrees of ED

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

One

Table 1: Respondent’s Demographic Characteristics

	Frequency(N)	Percent (%)
<b>Sex</b>		
Male	78	100.0
Females	0	
Total	78	
<b>Age (years)</b>		
16-19	10	12.8
20-29	4	5.2
30-39	8	10.2
40-49	22	28.2
50+	34	43.6
Total	78	100.0
<b>Marital Status</b>		
Married	38	48.72
Single	28	35.9
Divorced	6	7.69
Separated	6	7.69
Total	78	100.0

Considering their employment status, a greater proportion of the participants were working thus either employed or self-employed they aggregately formed 67.6% (thus 52 of the participants) of the entire participants. A few were unemployed 18.2% and the rest were students which formed 14.3% as seen in the figure 4.1 below.

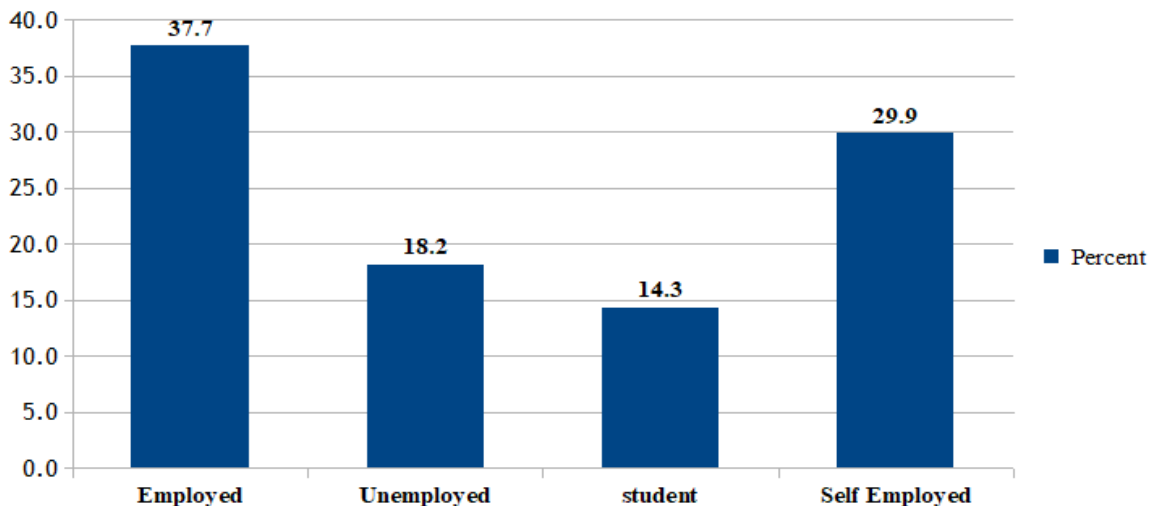


Figure 4.1 Participants Employment Status

Majority of the participants thus 40(51.9%) were secondary school levers, followed by Tertiary levers 14 (18.2%). A few of them had their basic education constituting 26.0% and the rest has no education at all. More than half of the participants were Christians with the rest Muslims as far as religion was concerned (Table 2)

Table 2: Participant's Characteristics Cont...

		Frequency	Percent (%)
Education	Basic	20	25.64
	Secondary	40	51.28
	Tertiary	14	17.95
	No Education	4	5.13
	Total	78	100.0
Religion	Christianity	43	55.13
	Islamic	35	44.87
	Traditional	0	0.0
	Free Thinker	0	0.0
	Total	78	100.0

## Diagnostics Data/Characteristics of Respondents

Table 4.3 below presents a summary of the diagnostics outcomes of the participants. All the participant's Chest X-ray results showed "Suggestive" and also their GeneXpert also showed "positive". The majority of them, thus 66 forming 84.6% had pulmonary TB with the rest having Extra Pulmonary TB (15.4%). Pleural effusion (69.2%) was the majority amongst those who had Extra Pulmonary TB.

Table 4.3: Diagnostics Data/Characteristics of Respondents

		Frequency(N)	Percent (%)
Chest Xray Results	Suggestive	78	100.0
	Not Suggestive		
	Not Done		
GeneXpert	Positive	78	100.0
	Negative	0	
	MTD not detected	0	
	Not Done	0	
Type of TB	Pulmonary TB	66	84.6
	Extra Pulmonary	12	15.4
	Total	78	100.0

Type of Extra Pulmonary	Pleural Effusion	54	69.2
	Disseminated Kochs	14	17.9
	Pericardial Effusion	3	3.8
	TB Meningitis	3	3.8
	Lymphadenitis	2	2.6
	Abdominal Lymphadenitis	1	1.3
	Cerebral Toxoplasmosis	1	1.3
	Total	78	100.0

**Prevalence of Erectile Dysfunction among Tuberculosis patients**

From fig.4.2 below, among all the 78 (100%) patients who tested positive for tuberculosis, 84.6% (66) diagnosed with Pulmonary Tuberculosis had 39(59.9%) of them having erectile dysfunction as against those who did not 27(40.9%). Of the patients which had Extra Pulmonary Tuberculosis 12(15.4%) had 9(75%) patients with erectile dysfunction. The prevalence of the proportion of Tuberculosis patients having erectile dysfunction was 62.3%.

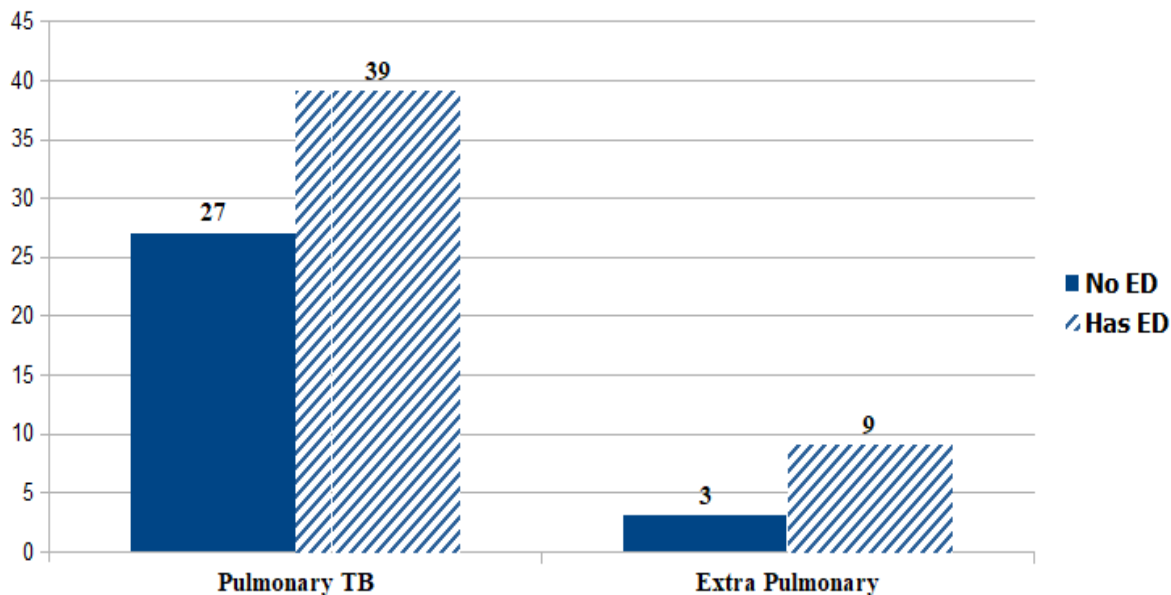


Figure 4.2 Proportion of TB patients with Erectile Dysfunction

**Erectile Dysfunction Responses by Participants**

Participants reported that they were able to have an erection during sexual activity. Only “a few times” 92.3% as contrasted against “always having” and it was difficult “sometimes” to maintain their erection even when it came, 84.6% (Table 4.4).

Table 4.4: Erectile Dysfunction Responses by Participants

Questions	Scale	Freq(N)	Percent (%)
How often were you able to get an erection during sexual activity?	Almost never	1	1.3
	A few times	72	92.3
	Sometimes	4	5.1
	Almost always	1	1.3
	Total	78	100.0
When you had erections with sexual stimulation, how Q2 often were your erections hard enough for	A few times	1	1.3
	Sometimes	77	98.7

Penetration	Total	78	100.0
When you attempted intercourse, how often are you able to penetrate (enter) your partner?	A few times	1	1.3
	Sometimes	77	98.7
	Total	78	100.0
During sexual intercourse, how often were you able to maintain your erection after you had Penetrated (entered) your partner?	Sometimes	78	100.0
	Sometimes	66	84.6
	Most times	11	14.1
During sexual intercourse, how difficult was it to maintain your erection to completion of intercourse?	Almost always	1	1.3
	Total	78	100.0

Table 4.5: Erectile Dysfunction Responses by Participants *Cont....*

Questions	Scale	Freq(N)	Percent (%)
How many times have you attempted sexual Intercourse?	A few times	17	21.8
	Sometimes	61	78.2
	Total	78	100.0
When you attempted sexual intercourse, how often was it satisfactory for you?	A few times	60	76.9
	Sometimes	17	21.8
	Almost always	1	1.3
	Total	78	100.0
How much have you enjoyed sexual Intercourse?	Sometimes	76	97.4
	Most times	2	2.6
	Total	78	100.0
When you had sexual stimulation or intercourse, how Did you ejaculate?	A few times	1	1.3
	Sometimes	77	98.7
	Total	78	100.0
When you had sexual stimulation or intercourse, how often did you have the feeling of Orgasm or climax?	A few times	73	93.6
	Sometimes	4	5.1
	Most times	1	1.3

Total                      78                      100.0

### Perception of Erectile Dysfunction Responses by Participants

80.8% of Participants responded about their perception of erectile dysfunction saying that they “sometimes” feel sexual desire and 16.7% responded they mostly also feel for sex They reported that despite the erectile dysfunction they were “moderately satisfied” 96.2% with the sexual relationship with their partners (Table 4.6). The majority of them were “moderately sure” that TB could cause Erectile 79.5% and a few 21.1% claimed TB medications could cause Erectile Dysfunction (Table 4.7)

Table 4.6: Perception of Erectile Dysfunction Responses by Participants

Questions	Scale	Freq(N)	Percent (%)
How often have you felt sexual desire?	A few times	1	1.3
	Sometimes	63	80.8
	Most times	13	16.7
	Almost always	1	1.3
	Total	78	100.0
How would you rate your level of sexual desire?	Low	2	2.6
	Moderate	72	92.3
	High	3	3.8
	Very high	1	1.3
	Total	78	100.0
How satisfied have you been with your overall sex life?	Moderately dissatisfied	72	92.3
	Eq. Sat.& dissatisfied	5	6.4
	Very satisfied	1	1.3
	Total	78	100.0
How satisfied have you been with your sexual relationship with your partner?	Moderately dissatisfied	1	1.3
	Eq. Sat.& Dissatisfied	2	2.6
	Moderately Satisfied	75	96.2
	Total	78	100.0

Table 4.7: Perception of Erectile Dysfunction Responses by Participants *Cont....*

Questions	Scale	Freq(N)	Percent (%)
How do you rate your confidence that you could get and keep an erection?	Low	69	88.5
	Moderate	6	7.7
	High	2	2.6
	very high	1	1.3
	Total	78	100.0
How sure are you that TB could cause Erectile	not sure	3	3.8

Dysfunction?	moderately sure	62	79.5
	very sure	13	16.7
	Total	78	100.0
How sure are you that your TB medications could cause Erectile Dysfunction?	not sure	1	1.3
	moderately sure	16	21.1
	very sure	59	77.6
	Total	76	100.0
How many times have you missed a dose over the past four weeks?	no answer	1	1.3
	don't know	1	1.3
	Once	40	51.3
	Twice	36	46.2
	Total	78	100.0

### 3.4 Relationship between sociodemographic and Perception of Erectile Dysfunction

Table 4.8 summarizes the relationship between demographic characteristics and Perception of erectile dysfunction. A Chi-square test indicated the demographic characteristics of the participants thus Age was the only demographic characteristic that had an association with the Perception of erectile dysfunction. Education, Marital Status, Occupation and did not have an association with the perception of erectile dysfunction. Age had statistically significant (LR=11.29;  $p < 0.05$ ) with a perception of erectile dysfunction.

Table 4.8 Relationship between sociodemographic and Perception of Erectile Dysfunction

Demographics	Perception of ED		X <sup>2</sup> (P- value)	Df	LR (P-value)	
	Poor	Good				
Age	Youth	16(72.7)	6(27.3)	-	1	11.29(0.001)
	Adult	55(98.2)	1(1.8)			
	Total	71(91.0)	7(9.0)			
Education	Basic	21(91.3)	2(8.7)	-	2	3.18(0.2)
	Secondary	35(48.5)	5(12.5)			
	Tertiary	14(100)	0(0.0)			
	Total	70(90.9)	7(9.1)			
Occupation	Employed	47(90.4)	5(9.6)	-	1	0.05(0.82)
	Unemployed	23(92.3)	2(8.0)			
	Total	70(90.9)	7(9.1)			
Marital status	Single	25(89.3)	3(10.7)	-	2	2.49(0.28)
	Married	33(89.2)	4(10.8)			
	Divorce/Separated	12(100.0)	0(0.0)			
	Total	70(90.9)	7(9.1)			



Religion	Christianity	38(88.4)	5(11.6)	-	1	0.65(0.42)
	Islamic	30(93.8)	2(6.3)			
	Total	68(90.7)	7(9.3)			

4.7 Relationship between Medication Adherence and Perception of Erectile Dysfunction

Table 4.9 summarizes the relationship between Medication Adherence by the participants and perception of erectile dysfunction. Almost all the participants did not adhere to the prescribed pattern of taking the medication (Figure 4.3). A Chi-square test indicated that medication adherence had an association (LR; p=0.03<0.05) with a perception of erectile dysfunction.

Table 4.9 Relationship between Medication Adherence and Perception of Erectile Dysfunction

		Perception of ED		X <sup>2</sup> (P- value)	df	LR (P-value)
		Poor	Good			
Medication Adherence	No Answer	0(0.0)	0(0.0)	-	1	0.18(0.03)
	Non- Adherence	71(92.3)	6(7.8)			
Total		71(92.3)	6(7.8)			

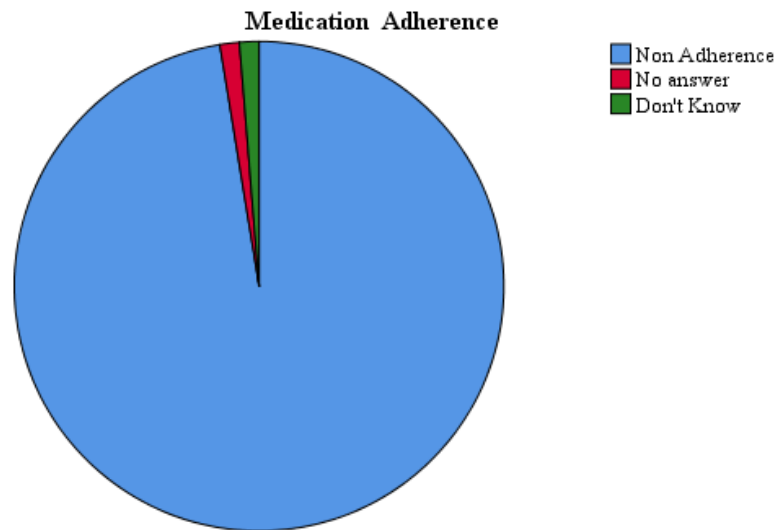


Figure 4.3: Medication Adherence by TB patients

Discussion

From the results of this study, it was evident that the perception of Erectile dysfunction (ED) Among Male TB patients is influenced by a number of factors such as age, level of education, co-morbidities, appropriate counseling, and other such factors. Even though One hundred and fifteen (115) respondents were the actual sample size to be studied but seventy-eight participants (78) participated in the study. The mean age group of the respondents was among the 40-49years age group with the majority age group being those who were 50 years and above which contributed 43.6% of the total participants. All the participants were males due to the topic under study. A greater proportion (44%) of the participants were married thus constituting 48.1% (37) of the entire participants followed by those who were single 28(36.4%), separated 6(7.8%), and divorced 6(7.8%). It was found out that 80.8% of Participants responded about their perception of erectile dysfunction saying that they “sometimes” feel sexual desire and 16.7% responded they mostly also feel for sex They reported that despite the erectile dysfunction they were “moderately satisfied” 96.2% with the sexual relationship with their partners (Table 4.6). The majority of them were “moderately sure” that TB could cause Erectile 79.5% and a few 21.1% claimed TB medications could cause Erectile Dysfunction. On the effects of sociodemographic characteristics on the patient’s Perception of erectile dysfunction, a Chi-square test indicated that the demographic characteristics of the participants thus Age were the only demographic characteristics that had an association (LR=11.29; p=0.001<0.05) with the perception of erectile dysfunction. Education, marital status, and occupation did not have an association with the perception of erectile dysfunction. For the Relationship between patients’ perception of ED and their drug adherence, the results indicated that almost all the participants did not adhere to the prescribed pattern of taking the medication (Figure 4.3). A Chi-square test indicated that medication adherence

had an association (LR;  $p=0.03>0.05$ ) with the perception of erectile dysfunction. With regard to the Prevalence of Erectile Dysfunction among Tuberculosis patients, the results indicated that all the patients, 100% ( $n=78$ ) who participated in the study tested positive for tuberculosis, 84.6% ( $n=66$ ) who had Pulmonary Tuberculosis had 39 (59.9%) who resulted in having erectile dysfunction as against those who did not 27 (40.9%). Of the patients which had Extra Pulmonary Tuberculosis 12 (15.4%) had 9 (75%) patients with erectile dysfunction. The prevalence of the proportion of Tuberculosis patients having erectile dysfunction was 62.3%. Research has proven that A number of diseased conditions have long been associated with erectile dysfunction such as TB, hypertension, diabetes, asthma, atherosclerosis, and many others. This is due to many Factors such as Age. Increasing age has been found to consistently worsen the prevalence of Erectile dysfunction [14][15] However, there has been a variation in prevalence rates according to the age difference [16] The rise in a number of risk factors and cardiovascular disease was also found to correlate with increasing age [17] Many aspects of sexual function are thought to decrease sharply with each decade after the age of 50 years [18] and [19] Pulmonary TB has been found negatively impact male sexual function and reproduction [20] This confirms that indeed TB erectile dysfunction among TB patients is real and must be taken seriously by healthcare providers. Studies have found that men who are diagnosed with cystic fibrosis (CF), a condition prevalent in most TB cases, are almost always infertile due to the congenital bilateral absence of the vas deferens [21]. Another study indicated infertility as an increasingly common reason for the diagnosis of Cystic Fibrosis (CF) in adults [22] Smoking is thought to lead to substance abuse and results in reduced lung function. Substance abuse and cigarette smoking are thought to also affect male performance in the long run. The polycyclic chains of tobacco are well known for their effect on the lungs. According to Heitzer, smoking has been found to potentiate endothelial dysfunction by inhibiting Nitric Oxide (NO) production [23] In another study carried out it was revealed that 64% of men experiencing erectile dysfunction smoked, which they felt was a significant finding. Depression is also a major factor in ED. [24] In a particular study, Erectile dysfunction (ED) has been found to correlate with depression [25] In another similar study, depression was found to be linked with cardiovascular disease and depressive symptoms which is an independent risk factor for reduced sexual activity [26] Diabetes is a major culprit when it comes to ED. In a scientific study in 2003, Diabetes Mellitus (DM) was found to positively correlate with erectile dysfunction [27] Another study [28], revealed a crude prevalence rate of 51.3% among men with diabetes and much higher than in the general population studies. Hypertension in men is thought to be a serious risk factor for erectile dysfunction. Evidence suggests that erectile dysfunction is more prevalent in men with hypertension and more severe than in the general population of men with ED [29] In a study carried out it was established that there exist significant correlations between Hypercholesterolemia and erectile dysfunction. [25] In a similar study by Barrett-Connor, hypercholesterolemia was found to be the most prevalent risk factor at baseline [31] lack of Exercise or physical inactivity, and Obesity has been found to be significantly and independently associated with erectile dysfunction [16] On the other hand, research has revealed that increased physical activity results in a lower risk of erectile dysfunction [33]. Another contributory factor is Immobile Cilia Syndrome (Kartagener's syndrome). It is a rare congenital disorder consisting of sinusitis, and bronchiectasis with situs inversus and is associated with infertility. It is the subgroup of the disorder called primary ciliary dyskinesia in which well-defined morphological or functional abnormalities of cilia result in sinopulmonary involvement with varying severity. Clinical manifestations involve chronic and/or recurrent respiratory infections with much heterogeneity in multisystem involvement. Pseudostratified ciliated columnar cells line the nasopharynx, middle ear, paranasal sinuses, larynx, trachea, and bronchi. Any functional disruption of mucociliary clearance due to uncoordinated and ineffective ciliary movement can progress to the connotation of long-standing sinonasal, aural, and pulmonary problems. More than 200 proteins and polypeptides are involved in ciliary formation and structure [34]. Another factor is the Psychological Impact and Societal Attitude towards it. The fact that one has to accept erectile dysfunction as a normal and inevitable part of aging is a challenge to many whose attitudes to erectile dysfunction is hostile. This acceptance causes some men to feel that resources should be focused on younger men due to sympathy for them [35]. In the end, there is a lot of physiological revolution in the mind of many men at this stage due to societal attitudes toward erectile dysfunction. There is also Stigma, Loss of identity, and self-worth due to Socio-cultural norms towards men with erectile dysfunction and this is the driving force in stigma creation. In fact, stigma has been identified as having an undesirable difference in an individual which leaves the person feeling discredited and having a sense of loss of identity and self-worth [36]. Research has identified a Lack of drug adherence as another factor that could cause a psychosocial disturbance. Psychosocial disturbance has the capacity to throw an individual out of line. In a study carried out by the United Nations, it was revealed that 50% of patients failed to take their medications correctly [37]. Another critical factor is the Lack of knowledge and time. It is important to have knowledge of counseling and of time in order to adequately attend to patients because it was shown to be a common barrier to entering discussions about erectile dysfunction [38] It is, therefore, important to prevent erectile dysfunction. It is realized that many healthcare providers find it embarrassing to deal with the subject of erectile dysfunction and this must be overcome as it constitutes a barrier that should be dealt with in order to reduce its incidence [39]. This study is relevant to improving the pharmaceutical care needs of patients. Patients need the assistance of an astute healthcare team to ensure that treatment regimens are properly explained to patients in order to improve health outcomes. In a study by Lincoln, it was revealed that 94% of healthcare staff were not likely to ask patients about sexual issues [40]. However, it was realized that only 15% of clinicians routinely asked men over 40 years of age about their sexual issues [41]

#### Limitations of the study

Some variables in the data were missing.

#### Conclusion

Over 62% of the patients in this study confirmed experiencing various degrees of erectile dysfunction. 80% of the participants have the perception that their erectile dysfunction was caused by the tuberculosis disease as well as medications. Their Perception can be said to have negatively impacted on their health outcomes since 92.3% of tuberculosis patients were non-adherent to their medications. Acknowledgement: The study team would like to acknowledge Michael D. Ashaley, Theophilus O. Agyemang, Winfred Agblo, Juliana Ashong, Department of Pharmacy, the staff of the Chest Clinic, Korle Bu Teaching Hospital (Ghana) and all participants for their immense support. Recommendations: Pharmacists and other caregivers must intensify patient counselling and drug education campaigns. Conflict of Interest: The team declare that they have no conflict of interest.

Acknowledgement: Pharmacy Department, Korle Bu Teaching Hospital, Department of Medicine, (KBTH), Staff of Chest Diseases Unit (KBTH), Department of Surgery (KBTH) and participants

## References:

- [1] J. Prins, "Review Prevalence of erectile dysfunction: a systematic review of population-based studies.," *International Journal of Impotence Research* , pp. pp. 422-432., 2002.
- [2] S. Sookdeb, "An investigation of factors that determine when men with erectile disorder present for treatment.," *Nurse Researcher 14(4)*, pp. 76-88., vol. 14, no. 4, pp. pp. 76-88., 2007.
- [3] H. Feldman, "Impotence and its psychosocial correlates: results of the Massachusetts Male Aging Study.," *Journal of Urology (151)*, pp. Journal of Urology (151), pp. 54-61, 1994.
- [4] N. Amidu, W. Owiredu, E. Woode, O. Addai-Mensah, K. Gyasi-Sarpong and A. Alhassan, "Prevalence of male sexual dysfunction among Ghanaian populace: myth or reality?," *Int J Impot Res.* , vol. 22, no. 6, pp. 337-42, 2010.
- [5] N. O. Amidu, G.-S. WK, W. CK and Q. L. E, "Sexual dysfunction among married couples living in Kumasi metropolis, Ghana.," *BMC Urol.*, 2011.
- [6] W. Owiredu, H. Alidu, A. N, C. Obirikorang, C. Gyasi-Sarpong, A. Bawah, P. Dapare and L. AT, "Sexual dysfunction among diabetics and its impact on the SQoL of their partners.," *Int J Impot Res.* , pp. 29(6):250-257., November 2017.
- [7] W. MG., The underlying pathophysiology and causes of erectile dysfunction. Clin Cornerstone, Wyllie MG. The underlying pathophysiology and causes7(1):19-27. doi: 10.1016/s1098-3597(05)80045-6. PMID: 16156420., 2005.
- [8] J. Copland, A Dictionary of Practical Medicine. London: Longman., London: Brown, Green, Longmans and Roberts., 1858.
- [9] R. e. a. DeBusk, "Management of sexual dysfunction in patients with," 2000.
- [10] I. e. a. Eardley, Erectile Dysfunction: A Guide to Management in, London: Primary Care. London: Mosby-Wolfe., 1999.
- [11] B. e. a. Davis-Joseph, Accuracy of the Initial History and Physical Examination to Establish the Etiology of Erectile Dysfunction. Urology, Davis-Joseph, B. et al. 1995. Accuracy of the Initial History and Physical: Urology 45 (3),pp. 498-502., 1995.
- [12] D. Sakheim, "Distinguishing Between Organogenic and Psychogenic Erectile Dysfunction.," *Behaviour Research and Therapy* , pp. Behaviour Research and Therapy 25(2), pp. 379-390, 1987.
- [13] D. e. a. Sakheim, Distinguishing Between Organogenic andPsychogenic Erectile Dysfunction., Behaviour Research and Therapy 25(2), pp. 379-390., 1987.
- [14] C. e. a. Bacon, Sexual Function in Men Older than 50 years of Age:Results from the Health Professionals Follow-up Study. Annals of Internal, Results from the Health Professionals Follow-up Study. Annals of Internal , 2003.
- [15] B. a. S. E. O'Sullivan, Erectile dysfunction and CHD: Related risk factors and implications for nursing practice., UK: British Journal of Nursing Practice 4(4), pp. 170-176., 2009.
- [16] E. e. a. Selvin, Prevalence and risk factors for ED in the US. The Prevalence and risk factors for ED in the US., US: American Journal of Medicine (120), pp. 151-157., 2007.
- [17] H. e. a. Feldman, Impotence and its psychosocial correlates: resultsof the Massachusetts Male Aging Study., Massacheussetts: Journal of Urology (151), pp. 54-61, 1994.
- [18] W. e. a. Bortz, Sexual Function in 1,202 Aging Males: Differentiating Aspects., Journal of Gerontology 54A (5), pp. M237-241, 1999..

- [19] A. e. a. Araujo, Changes in Sexual Function in Middle-Aged and Older Men: Longitudinal data from the Massachusetts male Aging Study, Araujo, A. et al. 2004. Changes in Sexual Function in Middle-Aged and Older Men: LongitudinalMassachusetts : Araujo, A. et al. 2004. Changes in Sexual Function in Middle-Aged and Older Men: Longitudinal dJournal of the American Geriatrics Society 15, pp. 1502-1509, 2004.
- [20] D. M. A. & E. Z. R. Magdy, Erectile dysfunction in pulmonary tuberculosis: is it a common association., Egypt: . Magdy, D.M., Metwally, A. & El Zohne, R.A. Erectile dysfunction in pulmonary J Bronchol 13, 105–108 (2019). [https://doi.org/10.4103/ejb.ejb\\_15\\_18](https://doi.org/10.4103/ejb.ejb_15_18), 2019.
- [21] O. CM, Fertility in patients with cystic fibrosis. Chest., Oct;118(4):893-4. doi: 10.1378/chest.118.4.893. PMID: 11035652., 2000.
- [22] E. L. C. M. Z. J. D. P. T. D. Gilljam M, Gilljam M, Ellis L, Corey M, ZielenClinical manifestations of cystic fibrosis among patients with diagnosis in adulthood. Chest., Gilljam M, Ellis L, Corey M, Zielenski J, Durie P, Tullis DE. Clinical manifestations of cystic fibrosis among patieOct;126(4):1215-24. doi: 10.1378/chest.126.4.1215. PMID: 15486385., 2004.
- [23] T. e. a. Heitzer, Cigarette smoking potentiates endothelial dysfunction of forearm resistance vessels in patients with hypercholesterolemia., Circulation 93, pp. 1346-1353., 1996.
- [24] V. C. etal, Prevalence of Asymptomatic Coronary artery disease in Men with Vasculogenic Erectile Dysfunction: A prospective Angiographic Study, European Urology (48), pp. 996-1003., 2005.
- [25] A. e. a. Araujo, Changes in Sexual Function in Middle-Aged and Older Men: Longitudinal data from the Massachusetts male Aging Study., USA: Araujo, A. et al. 2004. Changes in Sexual Function in Middle-Aged and Older MenJournal of the American Geriatrics Society 15, pp. 1502-1509, 2004.
- [26] G. e. a. Corona, Sexual function of the aging male. Best Practice and Research, Clinical Endocrinology and Metabolism 27, pp. 581-601., 2013.
- [27] M. M. K. I. G. E. G. D. R. E. Bacon CG, Bacon CG, Mittle Sexual function in men older than 50 years of age: results from the health professionals follow-up study., Bacon CG, Mittleman MA, Kawachi I, Giovannucci E, Glasser DB, Rimm EB. Sexual function in men older than 50 years of age: results from th Ann Intern Med. 2003 Aug 5;139(3):161-8. doi: 10.7326/0003-4819-139-3-20030805, 2003.
- [28] B. A. P. E. Selvin E, Selvin, E. et al. 2007. Prevalence and risk factors for ED iPrevalence and risk factors for erectile dysfunction in the US., USA: Selvin E, Burnett AL, Platz EA. Prevalence and risk factors for Am J Med. 2007 Feb;120(2):151-7. doi: 10.1016/j.amjmed.2006.06.010. PMID: 17275456., 2007.
- [29] B. T. B. L. K. A. P. R. S. A. d. I. T. A. H. O. S. R. Burchardt M, Burchardt M, Burchardt T, Baer L, Kiss AJ, Pawar RV, Shabsigh A,Hypertension is associated with severe erectile dysfunction., USA: Burchardt M, Burchardt T, Baer L, Kiss AJ, Pawar RV, Shabsigh A, de la Taille A, Hayek OR, Sha J Urol. 2000 Oct;164(4):1188-91. PMID: 10992363., 2000.
- [30] V. C. et, Prevalence of Asymptomatic Coronary artery disease in Men with Vasculogenic Erectile Dysfunction: A prospective Angiographic Study, European Urology (48), pp. 996-1003., 2005.
- [31] E. Barrett-Connor, Cardiovascular risk stratification and cardiovascular risk factors associated with erectile dysfunction: Assessing cardiovascular risk in men with erectile dysfunction., USA: Barrett-Connor, E. (2004), Cardiovascular risk stratification and cardiovascular risk factors associated with erectile dysfunction: AssesClin Cardiol, 27: 8-13. <https://doi.org/10.1002/clc.4960271>, 2004.
- [32] E. e. a. 2. Selvin, Prevalence and risk factors for ED in the US. The, US., 2007.
- [33] M. M. K. I. G. E. G. D. R. E. . Bacon CG, . Bacon CG, Mittleman M Sexual function in men older than 50 years of age: results from the health professionals follow-up study., . Bacon CG, Mittleman MA, Kawachi I, Giovannucci E, Glasser DB, Rimm EB. Sexual function in men older than 50 years of age: results from the heal Ann Intern Med. 2003 Aug 5;139(3):161-8. doi: 10.7326/0003-4819-139-3-200308, . Bacon CG, Mittleman MA, Kawachi I, Giovannucci E, Glasser DB, Rimm EB. Sexual function in men older than 50 years of age: results from the health pr 2003 .
- [34] T. A. C. P. A. R. C. S. G. N. A. V. C. S. A. S. P. A. K. D. A. A. M. Gupta, Assessment of erectile dysfunction and other sexual dysfunction in men with type 2 diabetes mellitus: A multicenter observational study in North India., India: 101136,ISSN 2213-3984,<https://doi.org/10.1016/j.cegh.2022.101136>., 2014.
- [35] W. Y. Z. S. T. H. Low WY, Low WYMalaysian cultural differences in knowledge, attitudes and practices related to erectile dysfunction: focus group discussions., Malaysia: Low WY, Wong YL, Zulkifli SN, Tan HM. Malaysian cultural differences

- in knowledge, attitudes and practices related to erectile dysfunction. *Int J Impot Res.* 2002 Dec;14(6):440-5. doi: 10.1038/sj.ijir.3900837. PMID: 12494275., 2002.
- [36] E. Goffman, *Notes on the Management of Spoiled Identity*. London, : Penguin Books, 1963.
- [37] C. G. F. World Health Organization, *Improving access to and appropriate use of medicines for mental disorders.*, Geneva:: World Health Organization; 2017. Licence: CC BY-NC-SA 3.0 IGO, 2017.
- [38] S. e. a. Doherty, *Cardiac Rehabilitation Staff Views about Discussing Sexual Issues with Coronary Heart Disease Patients: A National Survey in Ireland*, Ireland: *European Journal of Cardiovascular Nursing* 10, pp. 101-107.229, 2011.
- [39] W. e. a. Fisher, *Communication about erectile dysfunction among men with ED, partners of men with ED, and physicians: the Strike Up a conversation Study (Part 1)*, *Journal of Men's Health and Gender* 2(1), pp. 64-, 2005.
- [40] L. N. Haboubi NH, *Views of health professionals on discussing sexual issues with patients.*, Haboubi NH, Lincoln N. *Views of health professionals on discussing sexual Disabil Rehabil.* 2003 Mar 18;25(6):291-6. doi: 10.1080/0963828021000031188. PMID: 12623620., 2003.
- [41] S. e. a. Rutchik, *Practice Patterns in the Diagnosis and Treatment of Erectile Dysfunction among Family Practice Physicians.*, *Urology* (57), pp. 146-, 2001.

