

Original Research Article

Factors associated with delays in seeking tuberculosis treatment among patients at Muhima district hospital, Rwanda

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ABSTRACT

Background: Few studies exist in Rwanda to establish the reasons behind delays in seeking treatment in the health institutions which further affected timely diagnosis and case detection. The study investigated factors associated with delays in seeking treatment among tuberculosis (TB) patients at Muhima District Hospital, Rwanda.

Methods: The study adopted descriptive cross-sectional study of 49 smear-positive TB patients derived using proportion estimation of case registry (November 2016 to January 2017) newly-diagnosed patients, first and second months treatment. Systematic sampling technique used to select 60 TB patients from target population. Data collected by researcher and trained research assistant, using a close-ended questionnaire through a translation in local dialect.

Results: About 49% (24) of the smear-positive TB patients experienced delayed in seeking treatment for more than 180 days (6 months). Also 53% (26) were within the 36-45 age-cohort, while majority 75.5% (37) of the respondents was male. About 57% (28) of the respondents have poor knowledge of TB transmission. Similarly, about 51% (25) were the results on the perception of taking anti-TB medication, while median time interval from onset of symptoms and initiation of treatments was 45 days, average 71 days between 15 -180 days.

Conclusions: Statistically significant relationship exist between initial source of treatment using home remedies ($p=0.0$) and private insurance cover ($p=0.0$) in relation to delay, which further contributed to delay among majority. Recommendations of the study are strengthening medical services utilization, improving case detection, medical infrastructures and collaboration with non-formal healthcare practices.

Keywords: Factors associated, Delays in seeking tuberculosis treatment, Patients, Muhima district hospital

INTRODUCTION

Tuberculosis (TB) is second only to HIV/AIDS as the greatest killer worldwide due to a single infectious agent, *Mycobacterium tuberculosis* and occasionally by *Mycobacterium bovis*.¹ The disease is mainly transmitted through air by people with active pulmonary tuberculosis passing on infectious aerosol droplets by cough, sneeze, speak or singing.² If not treated, every person with active-tuberculosis infects an average of 10-15 people every year. The infectious bacterial disease generally affects the lungs (pulmonary tuberculosis) but can as well attack any other part of the body such as kidney, spine and brain

(extra-pulmonary tuberculosis). People sick with active pulmonary TB are able to pass infections to others, while those with extra-pulmonary TB are not infectious.

Early detection followed by effective therapy is extremely important in controlling TB. Delays in the diagnosis and treatment of TB may worsen the disease, result in more complications and lead to a higher mortality rate and infectivity in the community.³ These delays may partly explain the high mortality rates among people living with HIV (PLHIV) and may lead to a more advanced disease state at presentation which contributes to adverse sequelae and overall mortality.⁴ A recent TB study on

delay stressed that delays to diagnosis present a major obstacle to the control of TB epidemic although these factors may differ considerably among populations and their local settings.⁵ In addition, study in Angola, found that treatment delays within the province of Luanda suburban areas were due to the elapsing of time between onset of symptoms and the first consultation to a health care practitioner.⁶

The broad study objectives was to determine factors associated with delays in seeking treatment among TB patients in Muhima district hospital while the study specific objectives; to determine the level of knowledge of the patients with regard to TB illness, to identify the patients' perception on TB illness, to identify the initial treatment source of the patients with regard to TB illness and to determine the socio-economic and demographic factors which lead to delay of treatment among TB patients the study research questions; what is the level of knowledge of the patients with regard to TB illness? What is the level of patients' perception on TB illness? What are the initial treatment sources sought by the TB patients? Lastly, what are the socio-economic and demographic factors associated with delays in seeking TB treatment?

Globally, of the estimated 9 million people who developed TB in 2013, 1.5 million died from the disease, 380,000 of whom were HIV- positive. An estimated 1 million (13%) who developed it were HIV- negative children and 140,000 children succumbed to the disease the same year.¹ Sub-Saharan Africa carries the greatest proportion of new tuberculosis cases per population with over 225 cases per 100,000 of the population in the year 2012.⁸⁻¹⁰ The tuberculosis burden has increased with the advent of HIV/AIDS with a rise in likelihood that those infected with HIV/AIDS are 21-34 times likely to be infected by tuberculosis.^{11, 12}

Though, Rwanda is close to achieving the WHO target for treatment success, it is still below the target for case detection which is currently at 86 per 100,000 population against the future target of 67 per 100,000 population which is a reduction of 23% of TB incidence rate.¹³

A recent study assessed the level of perceived stigma and discrimination facing people living with HIV/AIDS (PLHIV) in Gasabo district, indexed that 74% of the people who had TB/HIV co- infection faced stigma and discrimination hence, leading to significant barriers to appropriate diagnosis and treatment of TB.¹⁴ The rapid situation analysis (RSA) was undertaken with the overall goal of identifying current gaps and challenges in the detection, care and treatment of TB amongst people living with HIV/AIDS. Even so, people continue to shoulder a burden of increased cases of tuberculosis especially with TB/HIV co- infection as the major association that has led to a significant impact to access and desire to seek care for tuberculosis leading to delayed care seeking and rejection of care. Further efforts are needed to reach the

goals especially for case detection as TB detection among people living with HIV/AIDS (PLHIV), continues to pose a significant barrier to care and treatment as screening among them remains constantly low.^{15,16}

In 2013, Rwanda registered 6000 tuberculosis (TB) cases countrywide and 2000 of them were in Kigali alone. In the same year the TB mortality rate was at 12 people out of every 100,000 of the population died from TB.¹⁷ As in many other resource constrained settings, treatment outcomes for tuberculosis has not been satisfactory among patients mainly because of people contracting this infection delay diagnosis hence making the treatment procedure very difficult and may later on generate worse complications.¹⁸ Despite most doctors showing concern on finding cases with this disease, there is still no study done to establish the reasons behind such delays.¹⁹

Late diagnosis is still considered among the driving factors that lead to continuous spread of the disease with Rwanda recently ranked as third lowest on newly confirmed cases of TB at 58 cases regionally, behind Tanzania and Burundi at 42 and 24 cases respectively.²⁰ Although Rajendra et al did a study on perception and beliefs on TB illness in rural Rwanda, in which he viewed that most individuals resulted to formal medical treatment when alternative non- formal treatment failed.²¹ This study tried to cover perception alongside other factors which might contribute to delay in seeking TB treatment within a health facility in an urban district in order to come up with more baseline information as to why such delays may still be registered in Rwanda.

In Rwanda, tuberculosis (TB) still remains a threat to public health as it is evident that the level of timely treatment among suspected TB patients remains significantly low hence posing a great threat to its continued spread, delayed control and treatment of the disease.¹⁸

Although TB diagnosis and treatment coverage has improved in the low-income countries especially in Sub-Saharan Africa, delay in case detection and treatment seeking still remains very low.

Studies from different countries have shown that; the respective government bodies have managed to put up health care facilities close to the residents but not all the services offered by these facilities are to the expectations of the residents. Most health centres close to the residents do not offer diagnosis for TB thus; it becomes a matter of concern when the patients have to receive referrals to district hospital (which are mostly the DOTS centres) in order to receive these services. The major challenge may be; the distance to the district hospital, transportation cost and decision-making process of the patient when told about such referrals.

Delays in case detection and treatment of TB has been reported by many medical experts of Rwanda therefore,

the aim of this study will be to establish the duration of delay and factors associated with it in order to come up with comprehensive solutions with regard to it.

METHODS

The study was conducted at Muhima District Hospital in Nyarugenge District. Nyarugenge district is one of the three districts of Kigali City. Nyarugenge is the least populated district in Kigali City, with a population estimate of 284,561 habitants but has the highest population density of 2,179 habitants/km². Majority of the zones covered by the district are urban 82% while rural zones occupy the least at 18%.

Muhima District Hospital sits on a 134 km² surface of land with a bed capacity of 128 and oversees the functionality of nine health centres within the district. Aside from the patient referrals received from the health centres within the district, it also receives patients from other regions of the country. The hospital functions as one of the major TB diagnostic service centres located in the district within the city often referred to as a centre for diagnosis and treatment (CDT) and a one-stop- service centre for HIV/TB co-infection. It offers complete diagnosis on TB patients using four complementary procedures; sputum culture, gene experts, chest X-ray and clinical diagnosis.

The study adopted a descriptive cross- sectional study approach for newly diagnosed smear- positive TB patients and patients who will have sought treatment two months before the actual period of study in order to generate more convenient information and better insights of the reasons behind the delays. The study variables included; dependent and independent study variables. Data on the findings were based on the duration taken by the patient in terms of time taken to receive treatment against the WHO recommended delay of two (2) weeks. The variables included; age, gender, education, occupation, residence, insurance cover, the type of initial health care treatment sought after the onset of TB related symptoms and alternative source of treatment.

The study duration was from March 2016 to April 2017. The study population included a total of 49 TB patients who had recently enrolled for diagnosis and treatment within a period of two months before the actual period of study and newly diagnosed smear- positive TB patients at Muhima District Hospital. The study included TB patients between the ages of 18-65 years who have been newly-diagnosed, not more than two months on treatment and who will have consent to participate in the study at Muhima District Hospital. This age group is chosen as it includes individuals who are considered as adults and are capable of making their own decisions.

Exclusion criteria in the study were patients below the age of 18years and above 65 years. Individuals on TB treatment for more than two months and those who will

not consent to participate in the study. Thus the sample calculation was determined using the formula for estimation of population proportion and then corrected using the finite correction formula.

$$n = \frac{[(Z1-a/2)^2 \times P \times (1-P)]}{d^2}$$

Hence, NF= [sample size (n)/n/(1+n/TTP)],

where; Z is the confidence interval of 95%, which corresponds to (1.96), P is the prevalence of TB in Kigali alone, D is the absolute level of precision which is 5% (error margin).

TTP is the total target population.

NF is the finite correction formula (which is a formula normally used for populations smaller than 10,000 people and used without replacement from more than 5% of a finite population).

$$n = \frac{[(1.96)^2 \times 0.18 \times (1-0.18)]}{0.05^2} = 227$$

10% of 227 = 22.7 227+22.7 = 250 n = 250

Finite Correction formula; NF= [(250)/1+ (250/60)] = 49

The total number of patients who took part in the study was 49 TB smear positive patients.

The study adopted the systematic sampling technique, which involved getting a list of 60 patients who attended the hospital and diagnosed with TB at the time of study and two months before the time of study. A skip interval of one was used to attain the 49 patients required for the study. Data was collected using close- ended questionnaire which contained questions as shown in appendices (Appendix 1). An ample time was given to the patients to allow careful probing of responses in order to minimize recall bias.

A pilot test was done on 10 TB patients in order to check on how effective the questionnaire was at in gathering the information and based on the results that they gave, the questionnaire proved to have been suitably modified and adjusted to suit local use. The 10 patients were selected from a different group outside the list of the participants in order to avoid sensitizing the actual group that the research on. Based on the answers that were provided, they allowed the research team to make modifications on them so that the instrument is more valid on collecting the data required.

Data was collected by the researcher for a period of one month using a questionnaire which was translated to Kinyarwanda. Data collected from the field was entered, edited and analyzed using the Microsoft Excel. Results are presented in the form of tables and figures.

The study was taken for approval from the Muhima District Hospital Ethics Committee to seek approval before data is collected. The research team explained fully possible benefits to the entire community and to the participants to assure them of privacy and confidentiality before requesting their consent into the study as per the procedures of the consent form. In addition to that, signed informed consent was obtained from each study participant and assured them that the information provided remained protected in accordance to the law. Any participant had the right to withdraw from the study at any time.

RESULTS

There is considerable delay in TB detection mainly due to patients’ delay in seeking treatment from a health care facility. The factors associated with patient delays included; insurance cover and initial contact of TB treatment sources. Analysis of factors associated with patient delay is an important step to identifying how to improve the quality of TB care and control. Relationships were assessed using regression analyses each independent variable against the dependent variable (duration of treatment delay) taken as a continuous variable. The level of statistical significance used was (p<0.05 alpha value).

The study findings on the distribution of responses with regards to delay in seeking TB treatment showed that 24 out of the total 49 TB patients delayed for more than 180 days in seeking TB treatment while a small number of about 5 study participants delayed by at-least 15days. The median time interval between the onset of symptoms and initiation of seeking treatment among the study population was 45 days with a mean of 71.25 days, within a range of 15-180 days (Figure 4.1: distribution of delay in seeking TB treatment)

Furthermore, the socio- demographic characteristics of the study participants showed that out of a total of 49 patients interviewed, 37 (75.51%) were male while 12 (24%) were female. A total of 37 (76%) of the respondents were married while quite a small number 6 (12%) of the respondents were each single and divorced. Slightly over half the patients 26 (53%) had attained primary education while 5 (10%) had no schooling. The study also found that slightly more than half of the respondents 29 (59%) lived in urban areas while 20 (41%) lived in rural areas. The results also showed that the highest number of respondents age cohort were between 35-45 years 26 (53%), with the oldest respondent being 65 years and the youngest 18 years accounting for 6 (12%).

The study finding with regards to the socio-economic characteristics: Majority of the respondents as in table 4.3: were self-employed (65%) while a very small number (8%) were employed by the government. Most of them were insured by the Community Health Insurance (mutuelle) (63%) while few of them had private insurance

coverage (4%). Majority of the participants earned at-least more than US\$30 per month (61%).

Table 1: Socio-demographic characteristics of the study population) and (Figure 1: Respondents' monthly income)

Table 1: Summary table of the socio-demographic characteristics of the study population.

Characteristic	Number	Percentage
Gender		
Male	37	75.51
Female	12	24
Total	49	100
Age(years)		
18-26	3	6
27-35	6	12
36-45	26	53
46-55	8	16
56-65	6	12
Total	49	100
Marital status		
Single	3	6
Married	37	76
Widowed	6	12
Divorced	3	6
Total	49	100
Residence		
Rural	29	59
Urban	20	41
Total	49	100
Education level		
No schooling	5	10
Primary	26	53
Secondary	11	22
Tertiary	7	14
Total	49	100

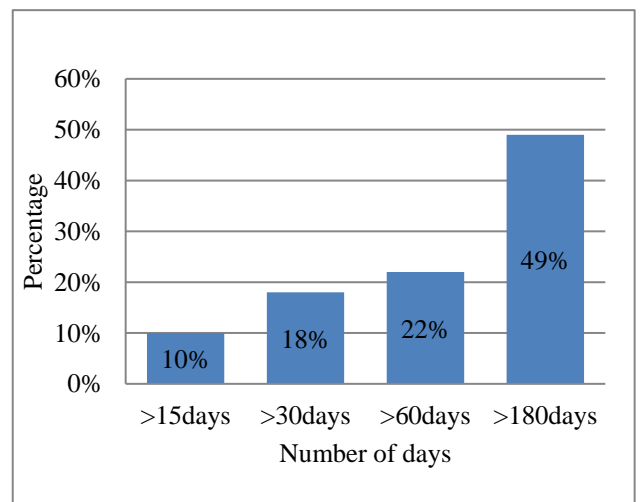


Figure 1: Distribution of delay in seeking TB treatment.

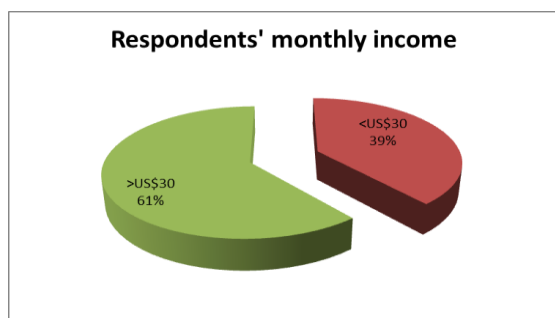


Figure 2: Respondents' monthly income.

The study of the relationship between the socio-demographic characteristics and delay in seeking TB treatment. The study established that there was no

statistical significance in delay among the respondents regardless of their gender ($p>0.05$). This was equally similar to other socio-demographic characteristics which were found not to have any significant influence on delay in seeking treatment. The percentage values indicate respondents' who responded with answers for each set computed column wise.

Also, the relationship between the socio-economic characteristics and delay in seeking TB treatment: The study found that there was statistical significance ($p=0.0$) between private insurance cover and delay. The study also established that there was no statistical significance ($p>0.05$) based on, employment status and monthly income and delay. The percentage values indicate number of respondents' computed column wise.

Table 2: Socio-demographic characteristics versus delay.

Variable category	Delay in seeking TB treatment (n=49)	P value	95% CI	
	Delayed (%)		Lower	Upper
Age (in years)				
18-26	6	0.5	0.0	0.2
27-35	12	0.8	0.1	0.3
36-45	53	0.5	0.4	0.7
46-55	16	0.2	0.1	0.3
56-65	12	0.8	0.1	0.3
Gender				
Male	75.51	0.6	0.6	0.9
Female	24	0.2	0.1	0.4
Marital status				
Single	6	0.6	0.0	0.2
Married	76	0.9	0.6	0.9
Widowed	12	0.8	0.1	0.3
Divorced	6	0.5	0.0	0.2
Residence				
Rural	59	0.4	0.4	0.7
Urban	41	0.2	0.3	0.6
Education level				
No schooling	10	0.1	0.0	0.2
Primary	53	0.3	0.4	0.7
Secondary	22	0.2	0.1	0.4
Tertiary	14	0.1	0.1	0.3

*Note: The percentage values indicate respondents' who responded with answers for each set computed column wise.

Table 3: Socio-economic characteristics of the study population.

Characteristic	Number	Percentage
Employment status		
Self	32	65
Private	13	27
Government	4	8
Total	49	100
Insurance cover		
Mutuelle	31	63
RAMA	10	20
MMI	6	12
Private insurance	2	4
Total	49	100

Table 4: Socio-demographic characteristics versus delay.

Variable category	Delay in seeking TB treatment (n=49)		P value	95% CI	
	Delayed (%)			Lower	Upper
Employment status					
Self-employed	65		0.8	0.6	0.8
Private	27		0.6	0.2	0.4
Government	8		0.4	0.0	0.2
Insurance cover					
Mutuelle	63		0.3	0.5	0.8
RAMA	20		0.9	0.1	0.3
MMI	12		0.8	0.1	0.3
Private	4		0.0	0.0	0.1
Monthly income					
<US\$ 30	39		0.5	0.3	0.5
>US\$ 30	61		0.7	0.5	0.8

*Note: The percentage values indicate number of respondents' computed column wise.

Table 5: Initial source of treatment sought by respondents.

Initial source of treatment	Number	Percentage
First action taken when TB symptoms are noticed		
Herbalist	2	4
Home remedies	27	55
Pharmacy	8	16
Health care center	12	24
Total	49	100

Table 6: Initial treatment sources versus delay.

Variable category	Delay in seeking TB treatment (n=49)		P value	95% CI	
	Delayed	Not delayed		Lower	Upper
First action taken on noticing TB					
Home remedies	55%	0	0.0	0.0	0.1
Herbalist	4%	0	0.8	0.4	0.7
Pharmacy	16%	0	0.6	0.1	0.3
Health care centre	24%	0	0.9	0.1	0.4

*Note: The percentage values indicate respondents who responded with answers for each set computed column wise.

The initial sources of treatment sought: with regards to the first action to the symptoms of TB, only (24%) of the patients contacted a health care facility while a large percentage (55%) of them resorted to home remedies. The reason cited by the (55%) patients on why they resorted to home remedies when they noticed that the symptoms did not subside after two weeks was that they felt that it was a normal cough just like many others. Although (24%) sought medical advice from a health care facility, most of them delayed getting into contact with them for more than two weeks (>15 days).

Also the relationship between the initial treatment sources and delay in seeking TB treatment; All 49 respondents showed considerable TB treatment delays especially in relation to the first action each of them took when they first noticed TB signs and symptoms. There was statistical significance ($p=0.0$) among those sought initial treatment through home remedies.

The study participants' knowledge about TB was assessed by reviewing six fundamental statements on; cause, important signs and symptoms, mode of transmission, diagnosis, prevention and recovery from TB infection. Categorization of knowledge into good and poor was dependent according to the number of individuals who responded with correct answers for each set of questions. Out of each segment distributed those who scored greater than or equal to 3 of the totals were considered to have good knowledge while those below the same number had poor knowledge. Overall assessment of knowledge with regard to the study, found that quite good knowledge was seen on the causes of TB, 29 of the 49 respondents knew the causes of the illness. Similar cases on good knowledge were also seen on the TB symptoms (41) and method of prevention (45) of the total 49 respondents. Such responses help to show that the participants are aware on the condition they are facing and are able to control its continued spread to others. On the other hand,

similar cases cannot be reported on knowledge on transmission as the respondents showed poor knowledge with (30) of them having very high misconception on sharing food with an infected individual. This result may

be a way of preserving better hygiene but might also be an influence of stigmatization which may cause a disruption in diagnosis.

Table 7: Knowledge on TB versus delay.

Variable category	Delay in seeking TB treatment (n=49)		95% CI	
	Delayed (%)	P value	Lower	Upper
Causes				
Good	60	0.7	0.4	0.7
Poor	40	0.1	0.3	0.6
Signs and symptoms				
Good	83	0.7	0.7	0.9
Poor	17	0.3	0.1	0.3
Transmission				
Good	43	0.6	0.3	0.6
Poor	57	0.5	0.4	0.7
Diagnosis				
Good	66	0.9	0.5	0.8
Poor	34	0.9	0.2	0.5
Prevention				
Good	91	0.2	0.8	1.0
Poor	9	0.3	0.0	0.2
Cure and recovery				
Good	63	0.9	0.5	0.8
Poor	37	0.6	0.2	0.5

*Note: The percentage values of the individuals with good or poor knowledge computed column wise.

Table 8: Respondents' level of perception on TB.

Item	Level of perception (%) (n=49)			Perception category (%) (n=49)	
	Agree	Disagree	Uncertain	Good	Poor
Perceived susceptibility	-	-	-	45	55
Sharing food with a TB infected individual	11	61	28	-	-
Living in a crowded and unventilated area	79	11	1	-	-
Perceived severity of TB illness	-	-	-	71	29
TB patients hardly engage in social activities	68	29	3	-	-
TB can be fatal if not treated	74	23	3	-	-
Perceived benefits of drugs	-	-	-	59	41
Poor/rich have equal chances of Anti- TB treatment	57	39	4	-	-
completion of TB drugs leads to normal happy lives	61	33	6	-	-
Perceived barriers in taking TB drugs	-	-	-	48	51
it is difficult to take TB drugs	87	9	4	-	-
TB treatment is expensive, costly and time consuming	4	91	5	-	-

*Note: The percentage values of the individuals with good or poor perception computed column wise.

The study further investigated the relationship between Knowledge on TB with delay in seeking TB treatment: The results showed no statistical relationship with one another. The overall relationship for each set of question was (p>0.05).

Moreover, findings on TB perceptions assessed by determining the patients' response about susceptibility, severity, drug benefits and barriers to taking the drugs and responses ranked into good and poor perception. Categorization of perception into good and poor was

dependent according to the number of individuals who responded with correct answers for each set of statement. Those who scored 1 out of the 2, showed poor perception while those who scored 2, showed good perception. Generally, result showed the respondents had good perception on TB based on severity (35) and (30) on the benefits of taking anti- TB drugs. Meaning that they are well aware of the consequences the disease has on their health and well- being. Contrary results were recorded on susceptibility and barriers to taking drugs as majority of the respondents feared sharing food with others (27) and majority found it difficult to take TB medication (25).

Table 9: Perception on TB versus delay.

Variable category	Delay in seeking TB treatment (n=49)		95% CI	
	Delayed (%)	P value	Lower	Upper
Susceptibility				
Good	45	0.8	0.3	0.6
Poor	55	0.9	0.6	0.8
Severity				
Good	71	1.0	0.2	0.4
Poor	29	0.2	0.4	0.7
Benefits				
Good	59	0.9	0.3	0.6
Poor	41	0.5	0.2	0.5
Barriers				
Good	48	0.9	0.3	0.6
Poor	51	0.5	0.4	0.7

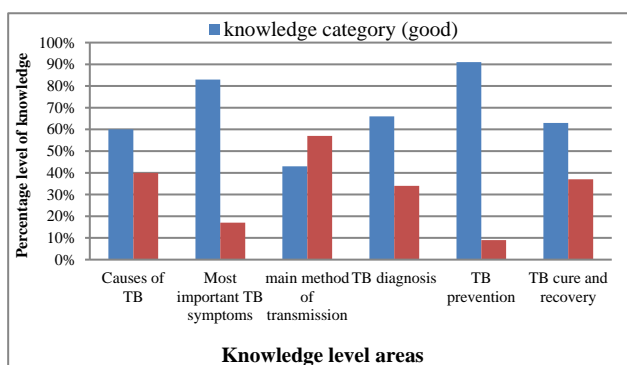


Figure 3: Level of knowledge of respondents.

Lastly, the relationship between perception of TB and the delay in seeking TB treatment overall perception on the four sets of questions showed no statistical significance in relation to delay in seeking TB treatment with ($p>0.05$).

DISCUSSION

Early diagnosis of disease and prompt initiation of treatment is essential for an effective TB control program. Delay in diagnosis may worsen the disease, increase risk of poor clinical outcome including death and enhance transmission of TB in the community. In the study, a total of 49 Smear- positive TB patients were interviewed. The number included a high number of males than females (75.51%: 24%). This finding was found to be similar to study carried in Ethiopia, where more males (63%) seemed to suffer from TB than females (37%).²³

Most of the respondents in the study were in the age cohort of 36-45 years (53%) indicating that most of the study participants included young adults. The overall number of patients who delayed seeking treatment was high among the same age group. Treatment delay was significantly higher among the same age 36-45 years, 46-55 years and 56-65 years. Delay significantly increased with an increase in age of the patient.

A large proportion of the patients 53% had attained primary level of education, unlike the small proportion of them 10% that had not gone to school. Majority of the delay in seeking TB treatment was seen among this group. This evidence supports a similar finding in a study conducted Malawi, which showed that there was longer delay in primary school level individuals than those with higher level.²⁴

Although slightly more than half 59% of the respondents were urban residents there was no significant relation to this with delay even with those from rural areas. This evidence was in contradiction with other studies in Ethiopia which showed longer delays among rural respondents due to different factors associated with delay but were not considered relevant to this study.²⁵

The study finding on socio economic characteristics equally contradicts other studies done, this study had no group of individuals who were unemployed, major difference was that the respondents had different job descriptions although there was no statistical significance in relationship with delay in seeking treatment ($p>0.05$). Hence, there was no strong relation with other studies that were previously done, an example of a study in rural setting of Nepal, India showed longer delay among the farmers who made up 65% of the total respondents.²⁶

Private insurance cover was seen to be an issue with regard to delay ($p<0.05$). Most of the participants cited the reason behind this was that there was delay in deciding when to seek treatment hence they took time to reach the health care facilities for proper treatment. Compared to another study done in China, it showed that respondents who were uninsured showed long delay in seeking treatment.²⁷

Based on the parameters used in this study to measure patients’ economic status in-terms of monthly earnings, the conclusion came up were those who earned less than or more than US\$30. This finding was based on the

responses given from Appendices (Appendix 1: questionnaire) under the questions on socio- economic status (q2-q5) and hence calculated on average use and expenses to come up with an appropriate monetary bracket. The results of this study indicate that there was no statistical significance between income and delay although it may be a contributing factor. The results are in line with a previous study done in Ethiopia, where low monthly income (less than US\$ 1) was an independent predictor of prolonged patient delay.²⁸

This study found that most respondents (55%) turned to home remedies when they first noticed the signs and symptoms of TB. While others sought treatment from pharmacies, health care centres and a very small number consulted herbalists. The delay was significantly found to be associated with the first form of health contact sought on the onset of symptoms especially with those who turned to home remedies for treatment ($p=0.0$). These results were similar to a study conducted in rural Rwanda, where most resorted to home remedies as they feared the cost of treatment in relation to their income and affordability.²⁹ Similarly another study conducted in Machakos, Kenya, recorded 81% of the respondents sought treatment from alternative sources causing delay for more than two weeks.³⁰ This delay was also similar to other studies conducted in Ethiopia, Ghana and Angola.

This practice of seeking health care from other sources has led to delay in seeking treatment in most regions and therefore increase in transmission of the disease as well as prognosis in patients. Overall knowledge on transmission remained considerable poor at (57%) while good knowledge on TB signs and symptoms was very high. This result is similar to a previous study done in Bellet-Weyne district, Somalia, which showed that 55.3% of the respondents delayed seeking treatment due to their misconceptions on TB transmission. This finding was also in correspondence to the participants' knowledge on TB, especially with regard to method of transmission.³¹ In a study conducted in Southeast Ethiopia, it showed that participants' poor knowledge on the transmission of TB, contributed to excess delay. This was noticed more amongst the pastoralist communities who sought treatment when the illness was already at an advanced stage.³²

The study perception on TB found a considerable poor perception in taking anti- TB drugs (51%) having similar reports on a study done in Somalia, where most resorted to home care treatment which was convenient or them than walking for long distances to the health care facility.³¹ Meanwhile in relation to perceived severity, the proportion of those with poor perception on TB severity remains low. This result is contradictory to a study done in rural Rwanda where TB symptoms were considered to be severe once the respondents noticed other symptoms such as weight loss and bloody sputum.²¹

This study on the area of delay in seeking TB treatment found that there was substantial delay in seeking TB treatment has great public health implications in a small country such as Rwanda. Ideally, the duration of symptoms and before treatment should be made as short as possible to ensure better treatment outcomes. However, considering the study situation and location it was necessary to use the cut- off point in delay to over 15 days, in accordance to the WHO recommendation of 14 days (two weeks). The researcher took this as the cut-off point because it deemed appropriate for the study participants and the study itself. Under this, some fundamental reasons remained priority especially with early symptoms such as fever during the night, chest pain, weight loss and productive cough considered when suspecting TB infection.

The median time interval of patient delay in the study was 45 days (mean of 71.25 days) within a range of 15-180 days with most of the seeking treatment after 180 days. These results were similar to a study conducted in rural Rwanda, where there was a high record of patients who sought treatment to a health care after six months.²¹ This result proves to be higher than that of Southeast Ethiopia which had a median of 34 days within a range of 7-105 days, but lower than that of Ghana 56 days and Somalia 86 days.^{31,32,35} These differences could be perhaps due to the difference in study population and access to health care services among the population.

CONCLUSION

There is considerable delay in seeking TB treatment among the patients at Muhima District Hospital which is contributed by patient's failure to seek prompt and appropriate health care following the development of TB signs and symptoms.

Although there was statistical significance between private insurance cover ($p=0.0$) and its relation to treatment delay, this study was able to conclude that most of the patients complained about delay in deciding when to seek medical treatment after self- medication failed.

The study found that the type of initial health treatment options sought by the population influenced delay ($p=0.0$) especially in relation to understanding the seriousness of visiting a health treatment facility at the time of unease. In addition to that, the time period that the patients took to reach a health care facility to seek appropriate diagnosis and treatment remained considerably high.

The results showed that majority of the patients had very high misconceptions on the spread of the disease which might somehow lead to them being stigmatized at household level. Fearing to share utensils and food with others lowered their self-esteem and consequently their sense of belonging. Although this practice may be considered a proper hygiene method, in the end it might still influence their belief in what they are taught.

Recommendation on the need for the TB health care providers to provide good education to the community on the importance of TB prompt diagnosis and on importance of taking medication instead of relying on other alternative medications.

The government should ensure that all public health facilities (equipment and personnel) to be highly disposable to the community so as to tackle problems at the lowest level in society, which is the family and that they should be well equipped with essential materials for diagnosis so that referrals are made earlier.

Study limitations

The main study limitations are financial burden because no support got from any institution and the time period was very little.

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APPENDIX 1

Questionnaire

This questionnaire is to be addressed to all TB patients between the ages of 18-65 years.

Date of interview _/_/_ (dd/mm/yy), Interviewer_, ID#_

Section A: Socio-demographic information.

Q1. Age (in years)?

- i) 18-26
- ii) 27-35
- iii) 36-45
- iv) 46-55
- v) 56-65

Q2. Gender?

- i) male (1)
- ii) female (2)

Q3. Marital status?

- i) single
- ii) married
- iii) widowed
- iv) divorced

Q4. What is the actual number of people currently living in your house? Specify.....

Q5. How many rooms does your house have? Specify.....

Q6. Where do you stay.....

Q7. Which is your highest level of education?

- i) No schooling
- ii) Primary
- iii) Secondary
- iv) Tertiary

Section B: Socio-economic information.

Q1. Are you employed?

- i) Yes
- ii) No

If yes, which type of employment?

- i) Self
- ii) Private
- iii) Government

Q2. Does your household own any of the following?

Radio
Television

- Mobile phone
- A refrigerator
- A computer
- None of the above

Q3. What type of fuel does your household use?

- Electricity
- Gas
- Kerosene
- Charcoal
- Wood
- Biogas
- No cooking done

Q4. Does any member of this household own?

- Bicycle
- A motorcycle
- A car
- None of the above

Q5. Does your family household own any agricultural/developmental land?

- Yes
- No

If yes, what kind of agricultural/developmental activity that goes on the land? Specify.....

Q6. Do you have an insurance cover?

- i) yes
- ii) no

If yes, which one?

- i) mutuelle
- ii) RAMA
- iii) MMI
- iv) private insurance, specify.....

Section C: Initial source of treatment sought.

Q1. To whom did you first seek treatment from when you first noticed the symptoms of TB?

- Herbalist
- Home remedies
- Pharmacy
- Health care center

Section D: Knowledge on TB.

Questions true false

1. What causes TB illness?

- a. Contaminated air containing microorganisms that cause TB
- b. A hereditary disease
- c. Witchcraft
- d. Smoking or drinking alcohol

2. What is the most important symptom for TB?
 - a. Persistent productive cough for over two weeks
 - b. Fever in the evening and night
 - c. Chest pain
 - d. Cough with blood
3. What is the main method of transmitting TB?
 - a. Inhaling aerosol droplets from cough of a nearby TB infected person
 - b. Sharing food and utensils with a TB infected person
 - c. Touching a TB infected person
 - d. Through sexual contact
 - e. Through mosquito bites
4. How is TB diagnosed?
 - a. Culturing of sputum
 - b. Chest X-ray
 - c. Blood examination
 - d. Stool and urine examination
5. How can one prevent himself and others from TB
 - a. Through vaccination
 - b. Covering of the mouth and nose when sneezing or coughing
 - c. Avoiding crowded places with poor ventilation
6. What do you know about the cure and recovery from TB
 - a. Curable through medication
 - b. Cannot be cured
 - c. Traditional healing

Section E: Perception of TB

Statement agree disagree uncertain

1. Susceptibility to TB

Eating from the same plate of a TB infected person you are likely to get it.
Crowded and poorly ventilated environment poses risk to TB infection.

2. Severity of TB

Patients with TB find it hard to engage in social activities.
The seriousness of TB illness may become fatal if untreated.

3. Benefits of TB drugs

The poor or rich have equal chances of being treated with Anti-TB drugs.
TB patients who have completed their treatment can live happy normal lives.

4. Barriers to taking anti-TB drugs

It is difficult to take TB drugs
Treatment for TB is time-consuming.