Socio-Demographic and Economic Factors Influencing Adherence to TB Treatment in Mwingi East Sub-County, Kitui County, Kenya

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Summary

BACKGROUND

Globally TB is documented to have the second highest fatality cases after HIV and AIDS. Among the continents, Africa has the highest rates of TB cases among HIV positive patients. Kenya is among the first 30 countries with the highest rates of TB infection. The high rates and burden as a result of TB is associated with the level of adherence to TB treatment. This study was aimed at determining the adherence to TB treatment and the socio demographic and economic factors influencing adherence to TB treatment among TB patients in Mwingi East Sub County, Kitui County, Kenya.

MATERIALS AND METHODS

The study employed a descriptive cross sectional study design where quantitative data was collected using a semi structured questionnaire. Clustered random sampling was applied to identify TB patients to be included in the study. The data collected was analyzed using SPSS version 20 at 95% confidence interval. Both descriptive and inferential statistics (regression analysis) were carried out. The data was presented using tables and graphs.

RESULTS

Based on the results, rates of adherence to uptake of TB drugs among the TB patients was 65.3%. Age and occupation were the only socio demographic and economic factors found to significantly influence adherence to TB treatment.

CONCLUSION

The government and stakeholders in the health sector should put in place awareness training strategies on TB management for younger populations. The government should also review the employment policy to increase sick offs days for employees suffering from TB.

***Keywords**: Adherence, Non-Adherence TB, TB Treatment, Socio-Demographic Factors*

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Introduction

Tuberculosis (TB) is a global health problem which was declared as an emergency in 1993 by the World Health Organization (WHO). Based on a WHO report, the cases of TB declined from the period covering 2006 to 2010 (1). However in 2010 about 8.8 million new cases of TB were reported. Globally TB remains to be the second killer disease after HIV and AIDS with over 1 million deaths among HIV negative patients and 0.35 million among HIV/TB co-infected patients (2). Africa accounts for 79% of TB cases among HIV patients which is the highest proportion globally (3). The global targets are aimed at reducing TB deaths by 95%, reducing TB incidences by 90% and 0% rates of TB affected families under extreme monetary strain due to TB by the year 2035 (4).

The occurrence of TB is linked to malnutrition, poverty and overcrowding. Thus TB cases are highest in developing countries and in marginalized areas such as slums in big cities. The marginalized areas in big cities are characterized by social inequalities, HIV infection, drug and alcohol abuse, immigration among other factors that are determinants to the TB morbidity and mortality rates (1). Studies have reported socio economic factors such as homelessness, financial challenges, lack of transport, lack of food, gender, low levels of education among others to be key issues influencing adherence to TB treatment and consequently TB treatment outcomes (5,6). Furthermore individual characteristics such as knowledge on TB treatment, duration of treatment, effects of non-adherence to TB treatment and follow-up, fear of stigma and poor communication with health care workers have been cited as drivers of TB treatment outcomes. Researchers have also reported that cigarette smoking and alcohol consumption as individual behavioral factors affecting adherence to TB treatment (7,8).

Kenya is reported by the WHO as top 30 of the highest TB burden countries worldwide. In Kenya TB is the 4th leading cause of death despite the efforts put in place in the last 20 years by the government and its development partners (9). Based on a 2015 pre TB prevalence survey report, the incidence of TB was 233 per 100,000 (10). Furthermore based on 2016 survey report the prevalence of *Mycobacterium tuberculosis* confirmed pulmonary TB among adults was 558 per 100,000. Additionally the rates of TB among males was twice that of females and high rates were also reported in urban settings as compared to rural settings (11).

Adherence refers to the ability and acceptance of patients to take up TB treatment medications as per the guidelines given by the health professional (12). Thus the understanding of factors that influence the adherence to TB treatment is a prudent approach aimed at ensuring successful TB treatment outcomes. Therefore this study aims at understanding some of the socio demographic and economic factors influencing the adherence to TB treatment among TB patients in Mwingi East Sub County.

Materials and Methods

Study Site

This study was conducted in public health facilities in Mwingi East Sub- County, Kitui County, in the region formally known as Eastern Province of Kenya. The sub county is composed of four wards namely Kivou, Nguni, Nuu, Mui and Waita ward. The 2009 census in Kenya shows that, Mwingi Sub County occupies an area of 10,046 km^2 and is inhabited by 384,948 persons with a growth rate of 2.4%. Poverty level stands at 45.5% per capita income. The climate is hot and dry. The temperature ranges between 26^0C and 34^0C. Rainy seasons are between March-May (long rains) and October-December (short rains). Rainfall ranges between 400 mm and 800 mm per year, but is erratic (13)

Study Design

The study adopted a descriptive cross sectional study design. The design permitted inference of the independent factors i.e. socio demographic and economic characteristics with the dependent variable which was adherence to TB treatment.

Study Population

Study population was comprised of all TB patients attending TB clinic at Mwingi East Sub-County selected health facilities 18 years of age and above.

Sampling Method

The sample size of 120 TB participants was calculated using the formula by Moore *et al* 2006, who introduced the practice of statistics and simple random sample size determination when the population is less than 10,000. The confidence interval was set at 95% and a margin error of 5%.

Sampling Procedure

Clustered simple random sampling procedure was applied. The sub county was clustered based on the wards. Nguni and Waita wards were purposively sampled since they had TB treatment facilities. The sample was proportionately distributed with 74 TB patients being sampled from each of the TB treatment facilities. Random sampling was used to identify the TB patients to include in the study.

Study Variables

The dependent variable was the adherence to uptake of TB drugs while the independent variables were socio demographic and economic factors.

Data Collection

A semi-structured questionnaire was used to collect data on socio demographic characteristics of the respondents, rates of adherence and reasons for lack of adherence to TB treatment by the TB patients. The data collection was conducted by two research assistants under the supervision of the principal investigator. The two research assistants had prior training on data collection procedures and on the scope of the study.

Data Analysis and Presentation

Data analysis was done using SPSS version 20 for both descriptive and inferential analysis. Descriptive analysis was done using frequencies and percentages to determine proportions of adherence. Inferential analysis was conducted using binary regression analysis to determine socio demographic and economic factors influencing the adherence to TB treatment. Data analysis was done at 95% confidence interval. The data was presented using tables and figures.

Ethical Consideration

Ethical clearance for the study was sought from the University of Nairobi Ethical Review Committee. Permission to conduct the study was sought from the Kitui County Director of Public health. Consent was also sought from the study participants before commencement of the interviews.

Results

Socio Demographic Characteristics of TB Patients

More than a quarter of the patients were aged 30-36 years, 28.3% were 36-45years, 17.2% were 24-30 years, 13.8% were 18- 24% and 11.7% were below the age of 18years. There was an equal number of male and female TB patients included in this study. Over a third of the TB patients were married, 34.5 % were single, 14.5% were separated, 8.3 were widowed and 6.9 % were divorced. More than a quarter of the TB patients had only one child, 25.5% had three children, 24.8 % had no children, 11% had four children, 9.7% had five children and 2.1% had more than five children.

Over a half of the TB patients were not the household heads while 49.7% were the household heads. Most of the TB patients (75.9%) were Christians while 24.1% were Muslims. Over a third of the TB patients were business men and women, 32.4% of the patients were salaried employees, 15.2% were farmers and 11% were informal employees. Close to a third of the TB patients had tertiary education, 30.3% had attained secondary education, 19.3% had attained vocational education, 10.3% had studied up to upper primary, 4.1% had studied up to lower primary and 4.1% had no formal education. Over a quarter of the TB patients had an income of 10000 to 15000 Kenya shillings per month, while 25.5%, 24.8%, 16.6% and 4.1% of the TB patients had a monthly income of over 20000, 15000 to 20000, 5000 to 10000 and below 5000 Kenya shillings respectively. Tables presenting this information are presented in the appendix.

Adherence to TB Treatment

Close to two thirds of the patient had missed a dose for TB treatment while 34.7% of the patients had not missed a dose for TB treatment, as presented in the figure below.

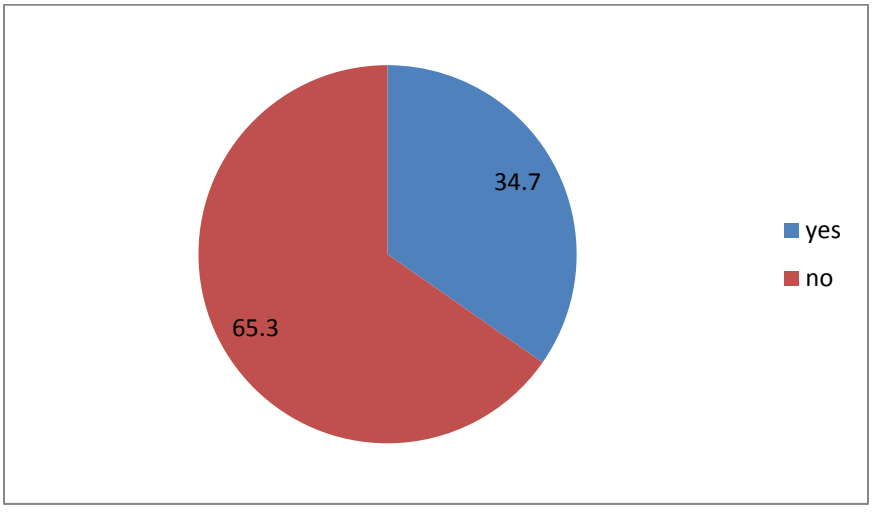

Figure 1: Proportion of Adherence to TB Treatment

Over two thirds of the patients who missed the TB treatment dosage reported that they missed to follow the schedule since their drugs got finished. The second predominant reason for missing TB dosages was forgetting to take drugs while the least cited reason (2.2%) was lack of medication in hospitals.

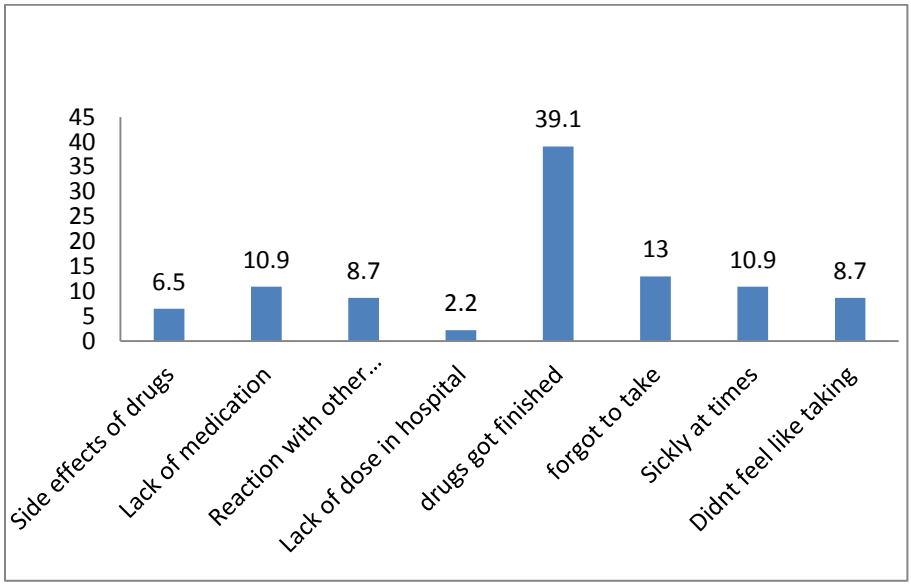

Figure 2: Reasons Why TB Patients in Mwingi East Sub County, Kitui County Missed TB Treatment doses

Socio Demographic and Economic Factors Influencing Adherence to TB Treatment

Based on the binary regression analysis age (p = 0.009) and primary occupation (p = 0.026) had a significant influence on adherence to TB treatment while the other socio demographic characteristics did not significantly influence adherence to TB treatment. In addition, TB patients aged 36 to 45 years were more likely to adhere to TB treatment as compared to younger TB patients of ages below 36 years [(Crude OR = 1.953, 95% CI = 1.180 – 3.231, P< 0.05)]. Additionally TB patients who were farmers were more likely to adhere to TB treatment as compared to salaried employees, business men and women [(Crude OR = 1.954, 95% CI = 1.082 – 3.527, P< 0.05)].

Discussion

The rate of non-adherence to TB treatment in the present study was considerably higher than 21% reported among TB patients in Nairobi, Kenya (14). Similarly based on a study conducted in Mumbai, India, the rate of non-adherence to TB treatment (16%) was lower compared to the values reported in the present study (15). Interestingly, the rates of adherence to TB treatment in the present study were higher than 60% reported among TB patients in Argentina (16).

The non-adherence to TB treatment is most likely to cause negative treatment outcomes such as treatment failure, drug resistance or even death.

The TB patients cited various reasons for no adherence to TB treatment. The major reasons cited included, health facilities running out of drugs, forgetting to take drugs on time, lack of bus fare to facilitate transportation to the health facility, fatigue and lack of money to purchase drugs when they are out of stock, among other reasons. Similarly, based on a study done in India, inadequacy of drugs was cited as a reason for non-adherence to TB treatment. The association between lack of drugs and non-adherence to TB treatment could be causing sharing of drugs among TB patients due to insufficient supply of drugs (15). This consequently predisposes TB patients to development of Multiple Drug Resistance TB (MDR TB).

In the present study, primary occupation of the TB patients was documented to significantly influence adherence to TB treatment where TB patients who were farmers were more likely to adhere to treatment as compared to salaried employees and business men or women [(Crude OR = 1.954, 95% CI = 1.082 – 3.527, P< 0.05)]. This observation could be attributed to the fact that business is demanding on time and thus, potentially causing non-adherence to TB treatment schedule. Similarly, in a study conducted in Khartoum, Sudan occupation was reported as one of the socio demographic factors significantly influencing adherence to TB treatment among TB patients (17).

In this study age was reported to have a statistical significant influence on adherence to TB treatment among patients [(Crude OR = 1.953, 95% CI = 1.180 – 3.231, P< 0.05)]. In fact older patients aged above 36 years were more likely to adhere to TB treatment, potentially because of having more information regarding TB gained through awareness training in TB clinics as well as experiences through other disease management. Similarly, based on a study conducted in Nairobi, age was cited as a key factor influencing adherence to TB treatment among TB patients (14). Equally, in a study conducted in Kibra, Nairobi County to document the rates and determinants of TB treatment follow up, age had no significant influence on adherence to TB treatment (18).

There is a contrast in findings between studies on socio demographic and economic factors influencing adherence to TB treatment probably due to differences in study designs used, study population, study locations and even time when studies were conducted. For instance in slum areas, invalid beliefs about the cause of TB catalyze the development of myths and misconceptions which leads to stigma and social exclusion. The stigmatization consequently hinders health seeking behavior which translates to high rates of non-adherence to TB treatment (19). It is thus clear that non adherence to TB treatment has become a complex phenomenon influenced by a wide range of interrelated factors which forms a conceptual framework through interactions with each other and puts pressure on the patients' tolerance to follow up the TB treatment schedule well (20).

Interestingly traditional factors thought to influence adherence to TB treatment such as gender, marital status, number of children, level of education and household monthly income were found to have no significance influence on adherence to TB treatment. Similarly, based on a study done in Sudan, gender, marital status and household size were some of the socio demographic factors which had no significance influence on TB treatment adherence (17). The study findings were also in line with reports documented in low income countries in Africa and Asia (21,22).

Conclusion

The rates of adherence to uptake of TB drugs were 65.3% among the TB patients. The reasons given for non-adherence to TB treatment included inadequacy of drugs, lack of money for transportation to the hospital facility, fatigue, forgetfulness, sickness, travelling among others. Socio and economic factors that were found to significantly influence adherence to TB treatment were age and occupation of the TB patients.

Recommendations

We recommend that:-

1. The government and stakeholders in the health sector develop awareness training strategies on TB management for younger populations, employees and people in business.
2. The government to review employment policy to increase sick off days for employees suffering from TB.

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Appendix

Table1. Socio-Demographic Characteristics of Participants

Variables	Frequency	Percentage
Age		
<18 years	17	11.7
18-24 years	20	13.8
24-30 years	25	17.2
30-36 years	42	29.0
36-45 years	41	28.3
Gender		
Male	71	50.0
Female	71	50.0
Marital status		
Married	52	35.9
Single	50	34.5
Separated	21	14.5
Divorced	10	6.9
Widowed	12	8.3
Number of children		
0	36	24.8
1	39	26.9
3	37	25.5
4	16	11.0
5	14	9.7
>5	3	2.1
Are you the household head		
Yes	72	49.7
No	73	50.3
Level of education		
No formal schooling	6	4.1
Lower primary(1-3)	6	4.1
Upper primary(4-8)	15	10.3
Secondary school	44	30.3
Vocational school	28	19.3
Tertiary	46	31.7

Table1: Socio-Demographic Characteristics of Participants Continued

Variables	Frequency	Percentage
Religion		
Christian	110	75.9
Muslim	35	24.1
Occupation		
Farmer	22	15.2
Salaried employee	47	32.4
Business man/woman	60	41.4
Informal employees	16	11.0
Income per month		
below 5000	6	4.1
5000-10000	24	16.6
10000-15000	41	28.3
15000-20000	36	24.8
Above 20000	37	25.5

Table 3: Regression Analysis of Socio Demographic and Economic Factors Influencing Adherence to TB Treatment

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B)	
								Lower	Upper
Step 1[a]	Age	.669	.257	6.785	1	.009	1.953	1.180	3.231
	Gender	-.085	.458	.035	1	.852	.918	.374	2.254
	Marital status	.274	.202	1.838	1	.175	1.316	.885	1.956
	No of children	-.152	.264	.332	1	.565	.859	.512	1.441
	Level of education	.330	.220	2.242	1	.134	1.391	.903	2.142
	Religion	.247	.539	.211	1	.646	1.281	.445	3.683
	Primary occupation	.670	.301	4.939	1	.026	1.954	1.082	3.527
	Household monthly income	.059	.236	.062	1	.803	1.061	.668	1.684
	Constant	-4.688	1.748	7.190	1	.007	.009		

a. Variable(s) entered on step 1: Age, Gender, Marital status, No of children, Level of education, Religion, Primary occupation, Household monthly income.