Socio-Demographic Determinants Influencing Prevalence Of Tuberculosis Among People Living In Bumble Sub County, Bingaman County, Kenya

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Abstract : *Tuberculosis (TB) is an infectious disease caused by the bacillus Mycobacterium tuberculosis. It typically affects the lungs (pulmonary TB) but can affect other sites as well (extra pulmonary TB). The classic symptoms of active Tuberculosis (TB) are cough with or without sputum containing blood, fever, night sweat, and weight loss. Tuberculosis is a highly contagious bacterial infection of the lungs that spreads through air when a person speaks coughs or sneezes. Up to 9.6 million people fell ill with TB and 1.5 million died from the disease in 2014. The tuberculosis prevalence in Bumula sub-County is high, there were 200 patients diagnosed with TB between the months of January 2016- December 2016 in the Sub County, and a case notification rate of 454 cases per 100,000 people. The aim of the study was to establish the socio-demographic determinants influencing Tuberculosis prevalence in Bumula Sub-County. The study design was descriptive cross-sectional design. A interview guide was used for data collection from all the 200 clients who had Tuberculosis. Data analysis was done using SPSS. Findings showed that the mean age of the participants was 42.92 ± 1.133 years, men 113 (56.5%) were more affected by TB than female 87 (43.5%). Age ($\chi2=20.973$, df=5, p=0.001). The marital status ($\chi2=11.414$, df=2, p=0.003), level of education ($\chi2=4.955$, df=3, p=0.044) were determinants affecting prevalence of TB in Bumula sub county.*

Keywords– *Prevalence, Tuberculosis, Microscopic confirmation, Socio-demographic factors*

I. Introduction

Introduction

Tuberculosis (TB) is an infectious disease caused by the bacillus *Mycobacterium tuberculosis.* It typically affects the lungs (pulmonary TB) but can affect other sites as well (extra pulmonary TB) (WHO, 2015).

Tuberculosis transmission occurs through droplet nuclei containing Mycobacterium tuberculosis*,* which are expelled by smear-positive pulmonary TB patients when coughing and sneezing, and remain suspended in the air. Inhalation of such aerosols may lead to infection. After close contact with an infectious case, 30–50 % of exposed susceptible contacts acquire latent TB infection (LTBI) (Lienhardt *et al.,* 2003). Overall, a relatively small proportion (5–15%) of the estimated 2–3 billion people infected with Mycobacterium tuberculosis will develop TB disease during their lifetime. However, the probability of developing TB is much higher among people infected with HIV (Tiemersma *et al.,* 2011).

The most common method for diagnosing TB worldwide remains sputum smear microscopy. In the last few years there are developments of new TB diagnostics methods, the use of rapid molecular tests to diagnose TB and drug-resistant TB, some countries are now phasing out use of smear microscopy (WHO 2015). Individuals are classified as Tuberculosis (TB) cases if they are either: culture positive with positive smear examination confirmed by nucleic acid amplification testing, or had clinical and radiographic presentation consistent with TB and responded to treatment with anti-TB (WHO 2010).

Up to 9.6 million people fell ill with TB in the year 2014, (12% HIV positive) 5.4 million men, 3.2 million women and 1.0 million children ,Only 6 million tuberculosis (TB) cases were notified (37% missing) (WHO 2015). In 2014, most notified TB cases were adults. Children (aged <15 years) accounted for 6.5% of notified cases (WHO 2015).

The male: female ratio of notified cases across all age groups was 1.7 according to WHO report (WHO, 2015). Over 95% of TB deaths occur in low- and middle-income countries, and it is among the top 5 causes of death. Approximately 90% of total TB deaths (among HIV-negative and HIV-positive people) and 80% of TB deaths among HIV-negative people occurred in the African and South-East Asia (WHO, 2015). Among pulmonary TB cases in the year 2014, 58% were bacteriologically confirmed and 42% clinically confirmed (WHO, 2015).

Globally in 2014, an estimated 480 000 people developed multidrug-resistant TB (MDR-TB), 3 million people who fall ill still unreached (WHO 2015).

In 2014, TB killed 1.5 million people (1.1 million HIV-negative and 0.4 million HIV-positive). The toll comprised 890 000 men, 480 000 women and 140 000 children (WHO 2015).

Africa carried the most severe burden, with 281 cases per 100 000 population in 2014 (compared with a global average of 133) (WH0, 2014). Tuberculosis case-fatality rate in Africa was 16–35% in HIV-positive cases not receiving antiretroviral treatment and 4–9% in HIV-negative cases (Mukadi *et al.*, 2001). Increased mortality during the first month of treatment seems largely attributable to the TB itself (Mukadi *et al.*, 2001).

The World Health Organization's (WHO) post-2015 global TB strategy has corresponding targets of a 90% reduction in deaths and an 80% reduction in the TB incidence rate by 2030 (WHO 2015).

Globally, the African region contributes 26% of the TB burden making the region the second after Asia which contributes 59% of the Global case load (WHO, 2012).

Studies in Tanzania have indicated that a proportion of patients on ART develop TB after starting ART, with about 50% during the first three months of treatment (Somi *et al.*, 2009).

Globally, the treatment success rate for people newly diagnosed with TB was 86% in 2013, a level that has been sustained since 2005. Treatment success rates require improvement in the region of the Americas and the European Region (75% in both regions in 2013) (WHO, 2014).

Kenya is ranked 15th among the 22 high TB burden countries that account for 80% of the global TB burden and 4th in Africa after South Africa, Nigeria and Ethiopia (DLTLD 2013). At least 60 people die of tuberculosis and 270 get infected with the disease every day (DLTLD 2015). It cost Kenya government 11 billion every year for tuberculosis management (DLTLD 2015).

Tuberculosis is the 4th cause of death among infectious diseases in Kenya (NTLD, 2015). In the year 2015, 81,518 cases of tuberculosis were notified, estimated incident by WHO were 110,000 cases. Case detection gap of 28,482 cases, 31% of the TB cases were co-infected with HIV (DLTLD, 2015). In 2012, the country notified a total of 103,159 TB cases (all forms of tuberculosis) of whom 39% were also HIV infected. Tuberculosis treatment results for TB patients started on treatment in 2010 showed a treatment success of 87% for new smear-positive pulmonary TB cases (DLTLD, 2013). The country had an incidence rate of 142 new smear positive cases per 100,000 people in 2009 (WHO 2010). The absolute number of TB cases notified has increased more than tenfold since 1990 while the TB incidence has increased from below 50 per 100,000 in 1990 to 329 per 100,000 populations for all forms of TB in 2008 (DLTLD, 2013). After 2007, the number of notified TB cases steadily declined until 2013, when the number of notified TB cases was approximately 89,000 – the lowest it has been in over a decade. The relative numbers of new bacteriologically confirmed cases and extra pulmonary TB cases have remained fairly consistent over time (DLTLD, 2013). From 2003 to 2012 the percentage of new cases that were bacteriologically confirmed ranged from 37.3 – 43.0%. However, the percentage of new extra pulmonary cases increased gradually since 2003 but maintained a narrower range: 15.1% to 18.2 % (DLTLD, 2013).

Males have higher TB case notification rates than females among all age groups, except for children (0-15 years) and young adults (15-24 years) where there were equal numbers of males and females affected. Adults aged 35 – 44 years had the highest case notification rates in both males and females; however, rates of TB among males in this age group were approximately 30% greater than rates of TB for females in the age group (Kipruto *et al.*, 2015).

Bungoma County the tuberculosis prevalence rate is 96 per 100,000 people (DLTLD, 2013).

In the year 2014 Bungoma County notified 1515 cases of tuberculosis with HIV co infection rate of 35% (DLTLD, 2015).

The aimed to identify the socio demographic determinants influencing TB prevalence in Bumula Sub-County

II. Methodology

Location of the study

The study was carried out in Bumula Sub County, which is in Bungoma county, western region with a catchment population of 116 023male are 48% female 52%. The main economic activity being subsistence farming, sugar cane being the main cash crop.

Research Design

The study adopted a descriptive cross-sectional design in nature that adopted both quantitative and qualitative research methods.

Study Population

The study target population were 200 registered TB patients of above 15 years from all the health facilities in Bumula Sub County in the year 2016. Who were accessed through households contact by community health volunteers and the health care workers.

Sampling Techniques and Sample Size Determination

This study adopted a survey method by involving all the study targeted population. Though Purposive sampling was used to collect qualitative data from 11 Key informants.

Data Collection Techniques and Data Analysis

Data was collected for two weeks using interview guides to collect quantitative and qualitative data respectively.

The quantitative data was cleaned, coded and analyzed using the version 20.00 of statistical package for social science (SPSS). Data was analyzed using descriptive statistics by measuring and testing frequency distributions, percentages and measures of central tendency, inferential statistics was done by measuring and testing relationships and correlations among the variables using Chi square tests. The findings were presented in; frequency tables cross tabulation and narrative forms.

Development and Pretest of Research Instruments

A structured interview guide was developed and used for collection of quantitative data. It was pre tested in Kanduyi Sub County to ascertain its validity and reliability before the actual study. The questionnaire was adeveloped in English and administered in Local dilate by research assistants where necessary.

Ethical Considerations

The study sought ethical clearance from Great lake university research and ethics committee. And approval and licensing from National Commission for Science Technology and Innovation (NACOSTI). Prior to data collection, permission was obtained from Bumula Sub County Hospital management team. Oral explanations of the study purpose done orally to respondents to assure them of anonymity, confidentiality and informed of their ability to withdraw from the study at any time. The data was kept under lock and key, there were no direct benefits for participating in the study.

III. Results

Respondent's characteristics

The study respondents were 56.5 %(n=113) males affected with TB compared to the female patients(43.5). The respondent's age ranged between 16 to 77 years old, median age of 42years and the mean age was 42.92 ± 1.133. The commonest age group affected by TB was 45-54, followed by 25-34 & 35-44 at 48 (24%), 35 (17.5%) and 35 (17.5%) respectively the results showed that the participants were married were more affected 106 (53.0) compared to the single 32 (31.0), those with primary education were mostly affected with TB at 97 (48.5%) followed by secondary education at 44 (22%) then by none at 44 (22%) and lastly tertiary at 13 (6.5%). The study also showed that farmers were more affected with TB at 95 (47.5%), followed by those with no occupation at 64 (32%) and the least was those with formal employment at 11 (5.5%). As shown in Table 1 below:

Table 1: Social demographic factors affecting prevalence of TB in Bumula sub county

Variable		Number (%)
Sex	Male	113 (56.5)
	Female	87 (43.5)
Age	15-24	33 (16.5)
	25-34	35 (17.5)
	35-44	35 (17.5)
	45-54	48 (24.0)

	55-64	23 (11.5)
	65+	26 (13.0)
Marital status	single	32 (16.0)
	married	106 (53.0)
	widowed/separated	62 (31.0)
level of education	none	44 (22.0)
	primary	97 (48.5)
	secondary	46 (23.0)
	tertiary	13 (6.5)
Occupation	none	64 (32.0)
	business	30 (15.0)
	formal employment	11 (5.5)
	farmer	95 (47.5)

Social Demographic factors associated with development of TB

The results showed that gender ($\chi2=0.026$, df=1, p=0.873), was not determinant significantly associated with development of TB. While age ($\chi2=20.973$, df=5, p=0.001), marital status ($\chi2=11.414$, df=2, p=0.003), level of education ($\chi2=4.955$, df=3, p=0.044) were significantly associated with development of TB as shown in Table 2

The result from key informant interview participants indicated that gender and age was determinant affecting TB in Bumula, few of them participants said that level of education and level of income were determinant affecting TB prevalence in Bumula as shown in Table 2 below.

Table 2: Social demographic factors associated with development of TB in Bumula Sub County

Variable		Type of Tuberculosis				
		PTB (%)	EPTB (%)	X^2	df	P value
Gender	Male	110 (56.4)	3 (60.0)	0.026	1	0.873
	female	85 (43.6)	2 (40.0)			
Age	15-24	33 (16.9)	0 (0)	20.973	5	0.001
	25-34	33 (17.9)	0 (0)			
	35-44	35 (17.9)	0 (0)			
	45-54	47 (24.1)	0 (0)			
	55-64	23 (11.8)	0 (0)			
	65+	22 (11.3)	0 (0)			
Marital status	Single	32 (16.4)	0 (0)	11.414	2	0.003
	married	106 (54.4)	0(0)			
	widowed/separated	57 (29.2)	5(100.0)			
Level of education	None	41 (21.1)	3 (60.0)	4.955	3	0.175
	primary	95 (48.7)	2(40.0)			
	secondary	46(23.6)	0 (0)			
	tertiary	13 (6.7)	0 (0)			

IV. Discussion

Socio demographic determinants influencing TB prevalence,

The results showed that age was a factor determining prevalence of TB, this results are similar with Younger (2016) study which showed that ages 25-44yrs were mostly affected as compared to other age group. Also Ndungu *et al*. 2013 and Kipruto *et al*., 2015 research done indicating TB affects more young adults than any other age group, this can be attributed to most young adults going out looking for employment and socialization making it easier to contact TB.

The results showed that marital status was associated with development of TB this is similar to Hill *et al.,* (2006) study showed that being divorced or widowed had a great risk of TB/HIV. Gustafson P. *et al* (2004) indicates that being single has different life style as they tend to seek job in town where they are likely to live with others in overcrowded place.

The results suggest that level of education was associated with prevalence of TB this results is similar to the study by Akhtar, (2003) showed that more than half of those who had TB had no formal education. Also similar to the studies done by Taha *et al*., (2011), Shetty *et al*., 2006) and Karima *et al*., (2012) which reported that illiterate people are more likely to develop the disease than those with higher education can be attributed to literacy levels enhances good adherence to preventive measures and likelihood to have good health seeking behavior.

V. Summary, Conclusion and Recommendations

Summary of findings

Findings on the socio demographic determinants of TB indicated that spread of TB was highly influenced by low income earners. In addition, the study established that the Bumula Sub County population had suffered from PTB and EPTB. The study also established that that cough, chest pain, difficulty in breathing, fever and night sweats as the first symptoms of TB. Lastly, the study found that the first places people seek for health care services were chemists, herbalists, private health facilities, public health facilities and self medication respectively.

Conclusions

The study established that socio-demographic factors are determinants that influenced spread of TB among the residents in Bumula Sub County.

Recommendation

Study recommends that people should be educated their living conditions in order to improve to reduce the prevalence of TB in people living in Bumula Sub County.

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