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Rate and Associated Factors of Discontinuation of Anti-Tuberculosis Treatment in Patients with Pulmonary Tuberculosis at Positive Microscopy in the City of Mbuji Mayi, DR Congo

—Case of the HDTC of Muya and Lubilanji Health Zones

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Abstract

Introduction: the objective of this work was to contribute to the improvement of the management of tuberculosis and to the reduction of the rate of abandonment of the anti-tuberculosis treatment by the determination of the associated factors in the city of Mbuji-Mayi. **Method:** the study is quantitative, it is kind of descriptive correlational. The sample is non-probabilistic of the accidental type, the size of which is **36** subjects. **Results:** 1) About the rate of discontinuation of anti-tuberculosis treatment: Our results CON anoint that of the total of **3029** tuberculosis patients who visited the health structures of these two health zones, **36** had discontinued treatment, a rate of **1.18%**. On **36** cases of abandonment, 9 cases (or 25%) had resumed treatment and 27 cases (75%) had completely abandoned. 2) A Factors associated with total discontinuation of treatment: The association between total abandonment of treatment and more variables of our study revealed that the middle of transport (χ^2 21.9440, p 0.049), consideration of the dignity of the per ringing in taking load (χ^2 25 4357, p 0.019) and the number of the tablets as a result of abandonment (χ^2 5.4152, p 0.019) are associated with the total abandonment of TB treatment. **Conclusion:** Despite all the concerted efforts to reduce the burden of tuberculosis, the latter remains globally significant. Strengthening health systems for early detection of tuberculosis and improving the quality of tuber-

culosis care, including rapid and accurate diagnosis, early initiation of treatment and regular monitoring, are priorities. Countries with higher TB rates than expected for their level of socio-demographic development should study not only the reasons for late consultation of TB patients, but also those related to the problem of discontinuing treatment and take corrective action.

Subject Areas

Nursing

Keywords

Tuberculosis, Rates, Abandonment, Anti Tuberculosis, Positive Microscopy

1. Introduction

Tuberculosis is a major global public health problem [1]. Each year, there are approximately 9 million new cases and nearly 2 million people die from this disease [2].

In 2015, the WHO [3] estimated the number of new cases (incidents) of tuberculosis at 10.4 million worldwide, including 5.9 million (56%) in men, 3.5 million (34%) in women and 1 million (10%) in children. People living with HIV accounted for 1.2 million (11%) of all new TB cases. Tuberculosis notification rates are 5 to 81 times higher in prisons around the world than in the general population [4].

Without treatment, the death rate is very high (up to 70% death within 10 years of infection in uninfected patients with HIV with sputum positive on microscopic examination), but the combination of drugs TB for years 1950 has helped dramatically reduce the mortality rate of the tuberculose [5].

Adherence to long-term treatment for tuberculosis is a complex phenomenon with a wide range of factors impacting therapeutic behavior. Failure to process defect is detrimental for both the patient and the community, with a higher risk of relapse [6].

The DRC, like any other low-income country, is not spared by this situation. In our country, tuberculosis is a disease that carries a heavy economic and social burden, and nearly 120,000 cases are reported each year. The DRC is among the twenty-two countries that bear eighty percent of the global burden of tuberculosis in general and is also among the twenty-seven countries with eighty-five percent of the global burden of disease, with regard to multidrug resistant tuberculosis. In 2014, the DRC with an estimated population of 72,505,278 inhabitants, it had an incidence of tuberculosis cases of all forms of 327 cases per 100,000 inhabitants [7].

In view of all these data so convincing that tuberculosis remains a major public health problem both internationally and nationally and more particularly in our communities where the dropout rate is not negligible, we have decided to

conduct a study relating to the determination of the rate and the factors associated with the total abandonment of anti-tuberculosis treatment in the HDTC of the MUYA and LUBILANJI Health Zones of the city of Mbuji-Mayi.

2. Material and Method

Our study is quantitative, it is kind of descriptive correlational whose purpose is to determine the rate and the factors associated with the abandonment of the very treatment TB in Zones Lubilanji and health Muya.

The target population consists of TB patients has bandonnés treatment in re making structures in charge of Zones health and Lubilanji Muya, during the period from January 01, 2013 to December 31, 2017.

To mount the study sample, we use the non-accidental probability sampling technique that involves taking the data available for the period of our investigation and the size rises to **36** subjects and this on basis of the selection criteria below:

1) Inclusion criteria for the case

- Being sick having abandoned anti-tuberculosis treatment in one of the HDTC of these two ZS;
- Be available on the day of data collection;
- Accept to participate voluntarily in the study;
- Have your file in the care structure with a clearly identifiable address.

2) Exclusion criterion

- Any patient who did not meet the criteria mentioned above.

The questionnaire and the literature review were used to collect data and record factual information. Thus, the data from the collection sites, recorded on the collection tools by the investigators were compiled, cleaned and then codified by creating new variables by the analyst. These data have been inputs with the EXCEL 2007 and operated by the EPI-INFO software Version 7.1.1.1. In bivariate analysis, we crossed the independent variables with the dependent variable to determine the link between them.

The results of this study have been estimated at a confidence interval (CI) of 95% the risk of error alpha set at 5% ($p = 0.05$). These results are presented in the form of commented tables and figures.

3. Results

3.1. Results Descriptive Analyzes

Table 1 shows the number of tuberculosis cases compared to dropouts from 2012 to 2018 in the HDTC of the MUYA and LUBILANJI health zones.

Figure 1 shows that out of the total of 3029 tuberculosis patients who attended the HDTC in these two health zones from 2013 to 2017, 36 patients had abandoned treatment, *i.e.* a rate of **1.18%**.

Figure 2 tells us that among the dropouts, 9 cases (or 25%) had resumed treatment and the 27 cases (or 75%) had completely abandoned treatment.

Table 1. Breakdown of the number of tuberculosis cases compared to dropouts from 2012 to 2018 in the HDTC of the MUYA and LUBILANJI health zones.

Health Zone	Year	HDTC	Number of Tuberculosis cases	Case of abandonment
1) LUBILANJI	2012	Mike Geller	289	3
		Our Lady	28	1
		St Sauveur	0	0
	2013	Mike Geller	303	5
		Our Lady	16	0
		St Sauveur	36	0
	2014	Mike Geller	292	0
		Our Lady	61	0
		Rogerphar	74	0
	2015	Mike Geller	118	0
		Our Lady	101	0
		Rogerphar	84	0
	2016	Mike Geller	170	0
		Our Lady	107	0
		Rogerphar	114	0
	2017	Mike Geller	89	1
		Our Lady	62	0
		Rogerphar	51	0
		St Paul	9	0
S/Total 1			2004	10
2) MUYA	2012	HGR Muya	124	4
		Fakab	97	0
	2013	HGR Muya	109	8
		Fakab	90	3
	2014	HGR Muya	111	9
		Fakab	68	0
	2015	HGR Muya	92	2
		Fakab	46	0
	2016	HGR Muya	86	0
		Fakab	69	0
		Kalala Mutombo	16	0
	2017	HGR Muya	21	0
		Fakab	35	0
		Kalala Mutombo	41	0
		Braiding	14	0
		Tshishima	6	0
S/Total 2			1025	26
GENERAL TOTAL			3029	36

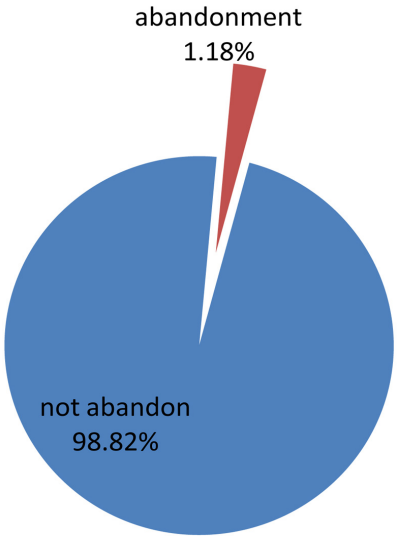

Figure 1. Rate of discontinuation of anti-tuberculosis treatment.

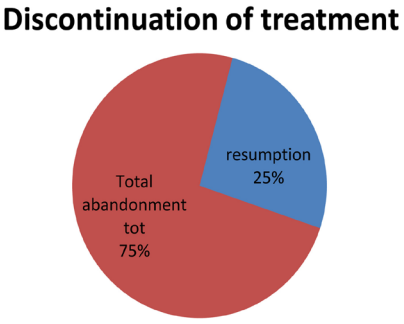

Figure 2. Distribution of respondents according to the modality of abandonment of treatment after interruption.

In Table 2, we see that the age group of 18 and over is more represented with 75%, but overall the average age is 30 + −16.1 years. In relation to sex, women are predominant with 58.3%. The majority are employed (77.8%), with marital status dominated by 47.2% of Singles. Most of them have a primary level of education calf, 34.3% and 55.6% of our respondents come from ZS Muya. The majority of respondents are non-smokers, *i.e.* 80.6%. 61.1% are not used to taking other toxic substances such as alcohol, psychotropic drugs and hemp. There was 69.5% absence of HIV co-infection.

In view of Table 3, we note that in general the patients appreciated that the reception was satisfactory in 55.5% of cases, the waiting time before the consultation seemed long for the patients (30 min and more) with satisfactory consultation in 52.8%.

75.0% of patients had no difficulty in communicating with healthcare providers, 88.8% approve of the existence of the posters talking about TBC and 63.9% the understanding of the messages transmitted, but explanations on the benefits of mandatory supervision treatment seemed to be neglected (55.5%).

Table 2. Distribution of respondents according to socio-demographic characteristics and factors linked to the patient.

Feature	Categories	Workforce n = 36	%
Age	Under 18	9	25
	18 years and over	27	75
Average age	30 + −16.1 years		
Sex	Male	15	41.7
	Female	21	58.3
Occupation	Without occupation	8	22.2
	With occupancy	28	77.8
Maritalstatus	Married	15	41.7
	Single	17	47.2
	Widowerwidow	4	11.1
Residence	ZsLubilanji	16	44.4
	ZsdelaMuya	20	55.6
Educational level	Without level	6	16.7
	Primary	13	36.1
	Secondary	9	25.0
	Superior	8	22.2
Smoking	Smoking	7	19.4
	Non-smoker	29	80.6
Othertoxichabits	Yes (alcohol, psychotropic drugs and hemp	14	38.9
	No	22	61.1
HIV co-infection	Yes	11	30.5
	No	25	69.5

Table 3. Distribution of respondents according to factors related to healthcare providers.

Factors	Categories	Workforce n = 36	%
Appreciation of the welcome	Satisfactory	20	55.5
	Not satisfying	16	44.5
Waiting time before consultation	Less than 30 min	17	47.2
	30 min and more	19	52.8
Duration of consultation	Less than 30 min	19	52.8
	30 min and more	17	47.2
Assessment of the consultation	Satisfactory	21	58.3
	Unsatisfactory	15	41.7
Communication difficulty	Yes	9	25.0
	No	27	75.0
Existence of TBC posters	Yes	32	88.8
	No	4	11.2
Understanding the messages transmitted	Yes	23	63.9
	No	13	36.1
Explanation of the benefit of mandatory Q3 supervision	Yes	20	55.5
	No	16	44.5

In Table 4, we see that 100% of patients walked a distance of less than 5 km between their home and the HDTC, 94.4% of patients made their way to receive the drugs, 75.0% say there was no drug out-of-stock, 100% of patients are not hospitalized were to die purpose of treatment, 69.4% say that there were mismatches between the time of decisions medicaments and their programs, the waiting time before taking medications fl is unsatisfactory for 61.1% of the patients, and they waited before taking medicines to inappropriate place (77.8%), 52.8% of patients had the feeling of being treated with dignity and 75.0% of patients have not solicited by the providers after discontinuation.

3.2. Bi-Varied Analysis Results

Table 5 shows that the association of sociodemographic characteristics and treatment discontinuation revealed no difference significantly.

From Table 6, we can see that there is no association between the factors related to the provision of care and the discontinuation of anti-tuberculosis treatment.

As shown in Table 7, the association between the organization of health services and total abandonment of treatment reveals that the Means of transport used (χ^2 21.9440; p 0.049) and the consideration of the dignity of the person in the care (χ^2 5.4357; p 0.019) are associated with total discontinuation of anti-tuberculosis treatment.

Table 4. Distribution of respondents according to factors linked to the organization of health services.

Factors	Categories	Workforce n = 36	%
Distance between home and HDTC	Less than 5 km	36	100
	More than 5 km	0	0
Means of transport used	Feet	34	94.4
	Motorbike	2	5.6
Out of stock of drugs	Yes	9	25.0
	No	27	75.0
Hospitalization at the start of Q3	Yes	0	0
	No	36	100
Adequacy of the medication schedule and its programs	Yes	25	69.4
	No	11	30.6
Waiting time before taking medication	Satisfactory	14	38.9
	Unsatisfactory	22	61.1
Waiting area before taking medication	Suitable room	8	22.2
	Inappropriate place	28	77.8
Feeling to be treated with dignity	Yes	19	52.8
	No	17	47.2
Being solicited after abandonment	Yes	9	25.0
	No	27	75.0

Table 5. Association between socio-demographic characteristics, patient-related factors and treatment discontinuation.

Feature	Total abandonment		χ^2	p	Meaning
	Yes n = 27	No n = 9			
Age					
Under 18	07	02	0.0011	0.973	**NS**
18 years and over	20	7			
Sex					
male	10	05	1.0864	0.297	**NS**
feminine	17	04			
Occupation					
without occupation	06	02	0.5637	0.452	**NS**
with occupation	21	07			
Study level					
insufficient	15	02	0.1130	0.736	**NS**
sufficient	12	07			
Smoking					
smoking	05	02	0.1903	0.662	**NS**
non-smoker	22	07			
HIV co-infection					
Yes	06	05	3.6223	0.057	**NS**
No	21	04			

Table 6. Association between factors related to caregiving and treatment discontinuation.

Factors	Total abandonment		χ^2	p	SIGN
	Yes = 27	No = 9			
Appreciation of the welcome					
Satisfactory	16	05	0.5718	0.449	**NS**
Not satisfying	11	04			
Waiting time before consultation					
Less than 30 min	12	05	2.8385	0.092	**NS**
30 min and more	15	04			
Assessment of the consultation					
Satisfactory	15	05	0.0065	0.935	**NS**
Unsatisfactory	12	04			
Existence of TBC posters					
Yes	23	09	1.1863	0.276	**NS**
No	04	00			
Understanding the messages transmitted					
Yes	07	02	1.1863	0.276	**NS**
No	20	07			
Explanation of the benefit of mandatory Q3 supervision			1.9254	0.165	**NS**
Yes	15	06			
No	12	03			

Table 7. Association between factors related to the organization of health services and total discontinuation of treatment.

Factors	A total band		χ^2	p	SIGN
	Yes = 27	No = 9			
Distance between home and childcare center					
Less than 5 km	21	07	0.1318	0.716	**NS**
More than 5 km	06	02			
Means of transport used					
Feet	25	04	21.9440	0.000	**S**
Motorbike	02	05			
Absence from treatment due to lack of money					
Yes	09	04	1.1879	0.275	**NS**
No	18	05			
Out of stock of drugs					
Yes	06	03	1.5603	0.211	**NS**
No	21	06			
Hospitalization at the start of Q3					
Yes	07	05	3.8554	0.049	**S**
No	20	04			
Adequacy of the medication schedule and its programs					
Yes	19	06	0.5485	0.458	**NS**
No	08	03			
Waiting time before taking medication					
Satisfactory	11	04	0.6265	0.428	**NS**
Unsatisfactory	16	05			
Waiting area before taking medication					
Suitable room	06	02	0.1318	0.716	**NS**
Inappropriate place	21	07			
feeling of being treated with dignity					
Yes	11	07	5.4357	0.019	**S**
No	16	02			
To be solicited after abandonment					
Yes	08	01	2.3415	0.1259	**NS**
No	19	08			

4. Discussion

4.1. Results of the Descriptive Analyzes

4.1.1. In Relation to the Treatment Abandonment Rate

Our results show that out of the total of 3029 tuberculosis patients who attended HDTC in these two health zones, 36 patients had abandoned treatment, *i.e.* a rate of 1.18%. This rate is close to that found in Kinshasa in 2009 by Okenge *et al.* [8].

In addition, out of 36 cases of discontinuation of treatment, 9 cases (*i.e.* 25%) had resumed treatment and the 27 cases (*i.e.* 75%) had completely abandoned. Comparing the statements of patients, this is related to patient follow-up, this is how the 9 cases ranks in the proportion of patients who were followed after recognition of their absence to treatment. As the observation made in our study, for

their part, Hill *et al.* [9] in The Gambia, had also noted in their study that among the 301 patients, there were 76 discontinuation of treatment (25.2%); 25 of them did not return for treatment. The dropout rate was higher among those who said they had doubts about the activity of their treatment (HR 3.64; 95% CI 1.42 - 9.21; p = 0.007) and among those who had significant costs in time and money to get to their treatment (HR 2.67; 95% CI 1.05 - 6.81; p = 0.04).

4.1.2. In Relation to Patient-Related Factors

The age group 18 and over is more represented with 75%, but overall the average age is 30 + −16.1 years. In relation to sex, women are predominant with 58.3%. The majority are employed (77.8%), with marital status dominated by 47.2% of Singles. Most of them have a primary level of education calf, 34.3% and 55.6% of our respondents come from ZS Muya. The majority of respondents are non-smokers, *i.e.* 80.6%. 61.1% are not used to taking other toxic substances such as alcohol, psychotropic drugs and hemp. There was 69.5% absence of HIV co-infection.

Contrary to our results, In Morocco, Ikrame Mouhi [10] in his study, the most affected age group is between 20 and 40 years, the male sex is more affected than the female sex; tuberculosis is more common in urban areas than in rural areas; extra-pulmonary involvement is the most frequent.

4.1.3. Results of Factors Related to Caregiving

The results show that in general the patients had appreciated that the reception was satisfactory in 55.5% of cases, the waiting time before the consultation seemed long for patients (30 min and more) with a consultaion satisfactory in 52.8%.

75.0% of patients had no difficulty in communicating with health care providers, 88.8% approve of the existence of the posters talking about TBC and 63.9% the understanding of the messages transmitted, but explanations on the benefits of mandatory supervision treatment seemed to be neglected (55.5%). In a survey carried out in the Brazzaville health region among 51 smear-positive pulmonary tuberculosis patients who had abandoned their treatment a few months previously by M'boussa J., Martins H., Adicolle-Metoul J.M., Loubaki F. [11], the author shows that all cultural and economic factors have been sought in the influence of this phenomenon, it appeared that the ignorance of patients is the main cause of abandonment attributable to the latter. The authors nonetheless think that the responsibility is shared because the information-education-communication component of the medical staff and being one of the essential elements of the organization of care, has a not insignificant influence on the abandonment of treatment in general. The best way to reduce the dropout rate which is 11.5% in Brazzaville is to apply the WHO DOTS strategy.

4.1.4. Results of Factors Linked to the Organization of Health Services

In our study, we find that 100% of patients walked a distance of less than 5 km between their home and the HDTC, 94.4% of patients made their way to receive the drugs, 75.0% say there was no drug out-of-stock, 100% of patients are not hospitalized were to die purpose of treatment, 69.4% say that there were mismatches

between the time of decisions medicaments and their programs, the waiting time before taking medications is unsatisfactory for 61.1% of the patients, and they waited before taking medicines to inappropriate place (77.8%), 52.8% of patients had the feeling of being treated with dignity and 75.0% of patients have not solicited by the providers after discontinuation. For his part, Lamia Hassani [12], like his fellow Moroccans, he shows that the organization of the health system was dominated by long waiting times (17%), inaccessibility to the treatment center (16.2%), insufficient health education, the constraints of treatment supervision (7%) and insufficient involvement of first-level health personnel.

In addition, Hill *et al.* [8] in the Gambia found that the dropout rate was higher among those who said they had doubts about the activity of their treatment (HR 3.64; CI 95% 1.42 - 9.21; p = 0.007) and in those who incurred significant costs in time and money to get to their treatment (HR 2.67; 95% CI 1.05 - 6.81; p = 0.04). And the following factors had different effects at different times: The uncertainty about treatment success was significant during the first 90 days of treatment, while an increased cost to get to the polyclinic was significant afterwards 90 days.

Another study conducted in the city of Antananarivo by Julio Rakotonirina *et al.* [13] supports that living far from the treatment center is correlated with abandonment (OR = 3.43 [1.16; 10, 15]). In this perspective of idea, a recent study carried out in Morocco on the risk factors of the abandonment of anti-bacillary treatment in patients with microscopically positive pulmonary tuberculosis (TPM+) by Habibi *et al.* [14] notes that the factors for abandoning anti-bacillary treatment were the long duration of treatment (53.6%), too many drugs (48.7%), the appearance of digestive intolerance (19.5%) and hepatic (2.4%), improvement in physical condition (17%), social problems (12%), psychological problems (4.8%), isolation in 9.7%, financial difficulties at (9.7%); 63.4% of patients know that interrupting treatment has risks for them; and only 24.3% know that this interruption has risks for those around them; 70.7% are for treatment supervision. Also, Lamia Hassani [11] found that the factors inherent to the treatment were mainly due to the long duration of the treatment, 81.4% of the patients interviewed had judged that the cause of their abandonment was the long duration of the treatment.

4.2. Bi-Varied Analysis Results

The association between the organization of health services and total abandonment of treatment reveals that the Means of transport used (χ^2 21.9440; p 0.049) and the consideration of the dignity of the person in the care (χ^2 5.4357; p 0.019) are associated with total discontinuation of anti-tuberculosis treatment. Unlike a study conducted in our country by Okenge NL, *et al.* [8], they found in their sampling survey in Kinshasa that the status of single OR 3.173 (1.232 - 11.037), the age below 40 years OR: 1.930 (1.215 - 4.054), ignorance of the etiology of the disease 0R: 20.210 (2.358 - 29.060), poor geographical accessibility 0R: 4.500 (1.289 - 15.573) and a poor source of information on the disease 0R: 4.451 (1.740 - 11.338) were factors determining the discontinuation of treatment.

5. Conclusion

Despite all the concerted efforts to reduce the burden of tuberculosis, the burden of the disease remains significant overall. Strengthening health systems for early detection of tuberculosis and improving the quality of tuberculosis care, including rapid and accurate diagnosis, early initiation of treatment and regular monitoring, are priorities. Countries with higher TB rates than expected for their level of socio-demographic development should study not only the reasons for late consultation of TB patients, but also those related to the problem of discontinuing treatment and take corrective action.

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