
PUBLIC HEALTH RESEARCH

Demographic Characteristics Associated with Missed Follow-Up Appointments among Tuberculosis Patients at Hospital Shah Alam, Selangor: A Retrospective Study from January to June 2023

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ABSTRACT

Introduction	Tuberculosis (TB) patients default their treatment during the treatment course. Therefore, this study aims to analyse the demographic characteristics of the patient who missed follow-ups and identify the reasons for missed appointments or defaulted their treatment.
Methods	The records of patients diagnosed with TB follow-up at the chest clinic from January to June 2023 were reviewed based on our inclusion and exclusion criteria.
Results	The retrospective descriptive analysis was conducted based on the data collected. Based on the study sample (n=33), the result shows that the majority of the defaulted patients were male in gender (n=22). Most of the missed appointments patients and defaulters are of Malay (39.4%) ethnicity and Malaysian nationality (66.7%). Most patients gave the transport issues as the reason for missed appointments followed by financial issues and feeling healthy. The majority of them missed follow-up in the first month after starting anti-TB.
Conclusions	In conclusion, missed appointments, treatment compliance and defaulted cases in TB treatment remain as one of the main challenges in the effort to end TB epidemics. Further in-depth research is required to propose effective measures to solve this issue and improve the national TB control program.
Keywords	Tuberculosis; Defaulter; Treatment; Loss to follow-up; Missed appointment

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INTRODUCTION

Tuberculosis (TB) remains one of the major communicable diseases of public health concerns in Malaysia. According to the Global Tuberculosis Report 2022 published by the World Health Organization (WHO), there is an increase in the estimated number of TB deaths worldwide between 2019 to 2021. There is also an increase in the cases of drug resistant TB worldwide between 2020 and 2021 with about 450000 cases of rifampicin resistant TB¹. Emergence and re-emergence of communicable diseases such as measles and TB is also a health challenge in Malaysia.²

One of the challenges for a successful TB treatment is compliance to the medication and follow-up. TB patients require at least 6-months of anti-TB treatment which includes 2-month of initiation or intensive phase followed by 4-months of continuation or maintenance phase. Strategies were outlined in the Malaysian National Strategic Plan for Tuberculosis Control 2016-2020 to ensure patient treatment compliance and drug adherence where one of them is an organized tracking for patients who missed the follow-up at TB clinic.³ Patient who have missed appointments will be contacted by the chest clinic staff and they will send notification to the district health office. District health office staff will do patient tracing to bring back to follow-up. This active searching and tracing will be done for a maximum of 8 weeks before the patient will be considered as a treatment defaulter. If a patient was able to be contacted, he or she will be given a new appointment date at the chest clinic for follow-up. However, a bulk of the patients were unable to be found due to a handful of reasons, for example patients relocated to other places and had changed their phone numbers and addresses.

Based on these issues, this study aims to investigate the demographic characteristics of patients who missed their treatment follow-up at a chest clinic in a public hospital in Malaysia. We intend to do a descriptive analysis of the demographic of these patients and identify their reason for missed follow-up along with months of anti TB treatment when the patient missed their follow-up for the first time.

Defaulting TB treatment carries higher risk of mortality.⁴ The majority of the patients lost follow-up during the continuation phase of the treatment. Reason contributed to the loss of follow-up mainly logistic and financial difficulties.⁵ This is notably important because in our study setting, patients were likely to be followed up at the chest clinic after being discharged from the ward. They may have come from other localities and districts, referred to hospital for inpatient treatment and then subsequently discharged and given appointment at chest clinic regardless of their home location or considering nearby health clinic.

In contrast to other study, most of the defaulted patients are still in the intensive phase.⁶ While another study investigates smoking behaviour and determinants to follow-up for TB patients and found out that there is a high number of patients that loss to follow-up among TB patients who smoke.⁷ This is in concordance with a study that found out patient treatment default can be predicted by considering patient and treatment related factors.⁸ Furthermore, being male and low education background are also associated with treatment default.⁹

On the other hand, a study found significant association between factors such as ethnicity, and mode of transport with probability of unfavourable treatment outcomes for TB patients registered in the district of Hulu Langat.¹⁰ A large number of patients appear to leave the treatment follow-up at a later stage in the treatment course suggesting that shorter duration of drug treatment may be beneficial.¹¹

METHODS

Settings

This study was done at a chest clinic in Hospital Shah Alam, Selangor. This hospital is a minor specialist district hospital equipped with 486 bed capacity. It is considered a secondary treatment centre where it accepts referrals from the nearby health clinics and private institutions. At the chest clinic, TB patients are reviewed by medical officers and physicians from the medical department. Complex TB cases will be discussed with the respiratory physician at the designated tertiary centre.

All the TB cases are kept track in a computerized database by the hospital TB Case Manager (TBCM) team and patients who default their follow-up will be informed to the district health office TB unit where the patients are registered. The district health office will then do investigation, tracing and bringing back the patients for their appointment at the clinic.

Data Collection

The study sample is taken from the TB clinic patient registry who were diagnosed and started treatment from January to June 2023. Patients who defaulted their treatment follow-up at the chest clinic were identified. Subsequently we review their electronic medical records to extract relevant information pertaining to our study. Registered TB cases were kept anonymous and using a unique identification as per the hospital electronic medical record (EMR) registration number (Figure 1).

Inclusion Criteria

Patients followed up for TB at the chest clinic from January 2023 to June 2023 and missed their appointment at least once during the treatment duration.

Exclusion Criteria

1. Patients who never missed their follow-up at the chest clinic.
2. Patients follow-up at paediatric TB clinic.
3. Patients age less than 18 years old.

The data points collected are categorized within these variables; Age is calculated by subtracting the year 2023 with the year patients were born. TB anatomical location is the system in the body infected with TB disease. If the patients had pulmonary TB with extra pulmonary involvement, it will be categorized as disseminated TB. Race is based on major ethnicity for Malaysian nationals and others will be selected for non-Malaysians. District health office that cases were registered to is taken from the patient record. This provides rough estimates of patient location to the chest clinic whether they are located in the same district as the clinic or not. Timing of patient missed appointments from starting treatment is calculated by month of TB treatment when patient missed appointment. Reasons for missed appointment were taken from the feedback given by district health office after they traced the patient or from the medical records of clinic encounter after the patients came back for appointment.

Statistical Analysis

Data collected were analysed using SPSS software version 25.0. Data points were input into the software and analysis was done based on the

category of the data. Descriptive statistics were obtained via the data analysis feature.

RESULTS

From patients diagnosed and registered with TB between January to June 2023, there are 33 patients who have missed clinic follow-up at least once. These patients were identified and their electronic medical records were reviewed. Data points were collected and then analyzed.

From our collected data (Table 1), the mean age is 43 years old at the time of missed appointment. There are 11 female patients (33.7%) and 22 male patients (66.7%) who were selected based on our inclusion and exclusion criteria. Majority of the patients are Malay (39.4%) and Malaysian nationality (72.7%). There are approximately similar percentages of active smoker (42.4%) and non-smoker (45.5%) patients in our study sample.

From Figure 2, we can see that the majority of patients in our sample were diagnosed with pure pulmonary TB (63.64%) followed by disseminated TB (21.21%), extra pulmonary TB (12.1%) and only 3% with latent TB infection.

From Table 2, the majority of the sample patients' reason for missed appointment was transport issues (n=8) followed by financial issues (n=7) and feeling healthy (n=5). Majority of the defaulted patients missed their appointment for the first time within 1 month of starting TB treatment (n=15).

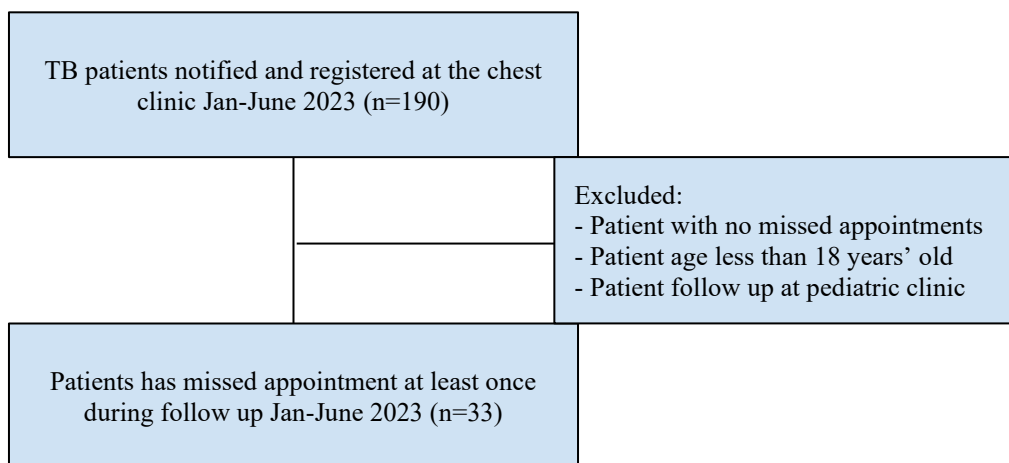


Figure 1 Data processing flow chart

Table 1 Demographic characteristics of the study sample

		n	%	Mean	Standard Deviation
Age				43	17
Gender	Female	11	33.3%		
	Male	22	66.7%		
Race	Bumiputra Sabah	2	6.1%		
	Chinese	1	3.0%		

	Indian	8	24.2%
	Malay	13	39.4%
	Others	9	27.3%
Nationality	Malaysian	24	72.7%
	Non-Malaysian	9	27.3%
Smoking status	Active smoker	14	42.4%
	Ex-smoker	4	12.1%
	Non smoker	15	45.5%
TB anatomical location	Disseminated TB	7	21.2%
	Extra pulmonary TB	4	12.1%
	Latent TB	1	3.0%
	Pulmonary TB	21	63.6%

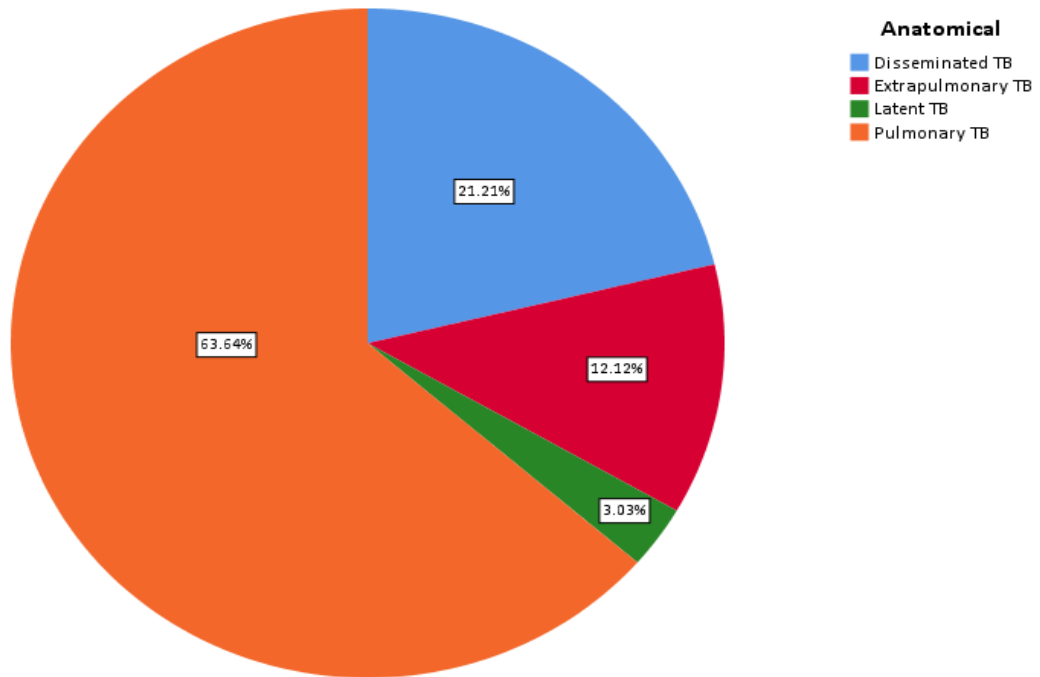


Figure 2 TB anatomical location

Table 2 Reason and month of first missed appointment

Reason of missed appointment	n
Transport issue	8
Financial issue	7
Feel healthy	5
Forgot appointment	4
Working	3

Health problem		3
Unknown		2
Far treatment location		1
Month of treatment of first missed appointment	1	15
	2	11
	3	5
	4	2

DISCUSSIONS

Our study shows that the majority of patients in our sample cited transport and financial issues as their main reasons for missed appointments. This is in particular where they have problems getting transport to the clinic or no friends or relatives available to send them for their appointment. We see that this reason is in accordance with a study from The Gambia, West Africa.¹² Therefore, we suggest that the state health department should take action to organize strategies so that these groups of patients can be seen and treated at nearby primary health facilities rather than treatment at the district hospital chest clinic.

Moreover, we found that from our study that the majority of the patients defaulted or missed their appointments within one month of TB diagnosis. TB treatment duration of a minimum 6 months is one of the challenges that clinician face to motivate and ensure treatment compliance. Some of the patients felt better and healthy even after one month of intensive phase treatment, thus they are unwilling to continue taking the medication on a daily basis and come for the appointment at the clinic. Nevertheless, any anti TB drug interruption for more than 2 weeks in the intensive phase should be restarted back.¹³ We also suggest that initial treatment consultation and counselling can be emphasized and improved to ensure patient understanding of the disease and treatment compliance.

Approximately 27.3% of the patients identified in our study were non-Malaysian nationals. These are foreigners who sometimes do not have proper legal documentation and unavailability of fixed living locations making the investigation and tracing by the district health office challenging. They were unable to be contacted to get them back to their clinic appointment. Furthermore, the treatment interruption will prolong the total treatment duration for the patient and this vicious cycle of interruption and prolonged duration will render their treatment more difficult to be completed. A study suggests that directly observed treatment (DOT) in foreigners can improve treatment compliance.¹⁴

There are some risk factors of high risk defaulting TB treatment that clinician should keep in mind during patient encounters in clinics or during rounds in the ward. Patients being male, have a history of drug interruption or retreatment after default are some risk factors identified.¹⁵ Urban populations also has higher risk of default compared to rural population.¹⁶ Patients at risk of missed appointments and defaulting treatment should raise red flag to the treating clinician and extra efforts during consultation can be made to ensure patient compliance to TB medication.

Moreover, patient compliance to the medication is hindered by a lot of other factors that happened during the follow-up. For example, there are patients who have significant gastrointestinal (GI) upset after taking TB medication that makes them unable to tolerate the medication. Being pensioner, unemployed and having substance abuse such as alcohol also has higher risk to default.¹⁷ However, we were unable to identify these reasons in our study population.

Limitations

In this study, small sample size (n=33) is one of the factors that can limit our results to be applicable to the general population. Moreover, data points that were collected from the patient's electronic records are limited by the information recorded and provided by the clinician during clinic encounters. Some data points regarding the reason for defaults and patient status were provided by their respective health offices from their feedback to the clinic when patient missed appointment were notified. Due to the nature of small sample size in our study, all data points were successfully captured without any missing data. Further detailed studies should be done to explore the effectiveness of the suggested interventions.

CONCLUSIONS

The challenges of maintaining patients throughout the treatment duration remains significant issue for a successful TB elimination program. From our study, we saw that majority of the defaulter were male, Malay, Malaysian nationalities, smokers either active or ex-smoker and have diagnosis of

pulmonary TB. The main reason of defaulting treatment being the transport and financial issue must be addressed by the national TB control program. Clinicians must be aware of the demographic characteristics of patients that have high risk of missed appointments and do appropriate interventions such as informing the health district office when discharging the patient and do effective treatment consultation.

Ethical considerations

Verbal permission was obtained from the physician in charge of the chest clinic and the hospital director for accessing and analysing the patient data to conduct the study. The study was conducted according to the guidelines of the Declaration of Helsinki, and did not include any identifiable human data. This study is registered in the National Medical Research Registry (NMRR ID-23-02939-DYD) and has attained ethics approval from Medical Research and Ethics Committee (MREC), Ministry of Health Malaysia.

Declaration of Conflict of Interest

The authors declare that they have no known conflict of interests or personal relationship that influence the work reported in this study.

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