

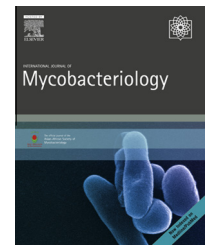


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# A cross-sectional study about knowledge and attitudes toward multidrug-resistant and extensively drug-resistant tuberculosis in a high-burden drug-resistant country

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## ABSTRACT

**Objective/Background:** Tuberculosis (TB) is a leading cause of death worldwide, with new threats of multidrug-resistant (MDR) and extensively drug-resistant (XDR) TB. Pakistan is the fifth highest among high-burden TB countries and the fourth highest among high-burden drug-resistant-TB countries. Pakistan is the sixth most populous country in the world, and Pakistani youth is the highest population group in Pakistan and second in the world. This study was aimed at assessing the understanding, awareness, and mindset of university students toward TB, MDR TB, and XDR TB in Lahore.

**Methods:** A cross-sectional questionnaire-based study was performed on 1137 individuals from three major public-sector universities in Lahore, Pakistan. Information regarding their knowledge and attitude toward MDR and XDR TB was gathered using a structured questionnaire. Data collected was analyzed using SPSS version 20.

**Results:** Male (531) and female (606) students were asked about different aspects of MDR and XDR TB. Although 80.47% students had good knowledge about simple TB, a very small fraction had awareness and appropriate knowledge about MDR/XDR-TB. Considering TB as a stigma, only 9.3% students disclosed that they had household TB contact. Only 25% students knew about XDR TB.

**Conclusion:** Our results indicated that a small fraction of people knew the exact definition and treatment duration of MDR TB and XDR TB in our society. There is a need to increase the awareness and knowledge status of university students about MDR and XDR TB.

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## Introduction

Tuberculosis (TB) is an infectious disease and one of the deadliest contagious diseases worldwide, reaching the status of

epidemic in several countries with high-burden TB. In 2014, 9.6 million people acquired TB infection leading to 1.5 million deaths [1]. Of the total TB cases and deaths, 5.4 million people were men, 3.2 million women, and 1.0 million patients were

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children [2]. According to the World Health Organization, Asia and Africa account for the highest burdens of TB in the world [1,3]. Every year, there are reports of approximately 9 million new TB cases, with the highest number of TB cases reported in Southeast Asia [1]. Pakistan is fifth among 22 high-burden TB countries and fourth among 27 high-burden multidrug-resistant (MDR) TB countries [4].

Regardless of the extensive availability of TB therapies, there is only 1.5% decline in incidences of TB per annum [5,6], and each year, 37% of new cases of TB remain undiagnosed [6,7]. Poor community knowledge, incomplete courses of anti-TB therapy [8], reduced involvement of government and community organizations [1], customary values, lack of availability of adequate health services [9], socio-economic factors, carelessness about personal health status, inadequate knowledge, and misconceptions regarding the disease [10] are some of the factors that hinder early TB diagnosis and treatment. Fear of being stigmatized is another decisive factor in delayed TB diagnosis and treatment [11].

The rapid increase in the incidence of MDR and extensively drug-resistant (XDR) TB complicate the issue. MDR includes resistance to two of the most potent first-line drugs (rifampicin and isoniazid) [12], while XDR TB is defined as MDR TB strains resistant to isoniazid, rifampicin, any fluoroquinolone, and at least one of the three second-line injectable drugs, such as kanamycin, amikacin, and capreomycin [13]. Knowledge about the timely and accurate diagnosis of drug-resistant TB is of supreme importance for suitable interven-

tion to halt disease progression. It also facilitates arrest of the transmission of MDR and XDR TB strains [14].

Due to lack of knowledge, patients generally leave treatment before completing the therapeutic regimen. The aftermath of incomplete regimens can be adverse, as they can develop MDR TB [15]. For this reason, proper knowledge about the disease is crucial to decreasing TB cases among the general population [16]. Lack of adequate knowledge about the cause, spread, and treatment of the disease leads to increased apprehension of stigmatization, and patients become averse to securing proper treatment. This social trepidation augments the spread of disease [17]. Pakistan has the second highest population of youth in the world. As of 2012, the literacy rate of Pakistan's youth was 56% [18], while the literacy rate of Pakistani youth (aged 15–24 years) is 77% for males and 53% for females [19]. In view of the high population of youth and the fourth highest incidence of drug-resistant TB, the current study was conducted with the primary aim of assessing TB knowledge among the youth of Lahore and to determine the level of understanding, awareness, and the mindset of university students toward TB, MDR TB, and XDR-TB.

## Materials and methods

### Study design

A cross-sectional questionnaire-based study was conducted among different individuals currently enrolled in three major



Fig. 1 – Geographical location of Lahore, Pakistan.

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