Jurnal Ilmiah Ibnu Sina, 11(2), Oktober 2026, 471-481
p-ISSN: 2502-647X; e-ISSN: 2503-1902

Self-medication Behavior among Tuberculosis Patients at Community Health Centers in Surabaya

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Artikel diterima: 2026-07-04; Disetujui: 2026-07-17
DOI: https://doi.org/10.36387/jiis.v11i2.3074

ABSTRAK

Penelitian ini bertujuan menggambarkan perilaku *self-medication* pada pasien tuberkulosis (TB) yang menjalani pengobatan di Puskesmas wilayah Surabaya. Studi observasional deskriptif pada 193 pasien TB paru di tujuh puskesmas, September–Desember 2025. Data dikumpulkan melalui wawancara terstruktur meliputi demografi, riwayat penularan, dan penggunaan produk *self-medication*, dianalisis secara deskriptif sebagai distribusi frekuensi dan persentase. Responden didominasi laki-laki (55,4%), kelompok usia 38-47 tahun terbanyak (20%), lebih dari separuh pekerja aktif (52%). Penyakit penyerta ditemukan pada 30% dan 9% merokok aktif. Sebanyak 59% melakukan *self-medication* bersamaan dengan OAT. Produk susu mendominasi konsumsi dengan susu kemasan (30%) dan susu sapi (29%), diikuti madu (13%) pada kelompok herbal, serta vitamin B kompleks dan vitamin C pada kelompok suplemen. Sebagian besar responden (66%) tidak mengetahui sumber penularannya. Perilaku *self-medication* pada pasien TB di Surabaya sangat tinggi dan diduga berkaitan dengan budaya lokal. Meskipun beberapa produk berpotensi sebagai terapi pendamping, OAT tetap tidak tergantikan. Edukasi berbasis bukti diperlukan untuk mencegah keterlambatan pengobatan dan mengoptimalkan luaran terapi.

Kata kunci: Tuberkulosis, puskesmas, sosiokultural, *self-medication*, obat tradisional, kepatuhan pengobatan

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ABSTRACT

This study aimed to describe self-medication behavior among tuberculosis (TB) patients undergoing treatment at community health centers in Surabaya. A descriptive observational study among 193 pulmonary TB patients at seven community health centers, September–December 2025, using a structured interview covering demographics, transmission history, and self-medication product use, analyzed as frequency distributions and percentages. Respondents were predominantly male (55.4%), mostly aged 38-47 years (20%), over half active workers (52%). Comorbid conditions in 30% and 9% were active smokers. In total, 59% practiced self-medication alongside standard TB drugs. Dairy products dominated consumption,

with packaged milk (30%) and cow's milk (29%), followed by honey (13%) among herbal products, and vitamin B complex and vitamin C among supplements. Most respondents (66%) were unaware of TB transmission source. Self-medication among TB patients in Surabaya is widespread and presumably influenced by local cultural practices.

Keywords: *Tuberculosis, community health centers, sociocultural, self-medication, traditional medicine, treatment adherence.*

INTRODUCTION

Tuberculosis (TB) remains a major global public health challenge. According to the World Health Organization (WHO), an estimated 10.8 million new TB cases were diagnosed worldwide in 2023, with 1.2 million reported deaths (WHO, 2024). Indonesia ranks second after India, accounting for approximately 10% of the global TB burden (WHO, 2024). Nationally, the number of TB cases increased from 724,309 in 2022 to 821,200 in 2023 (Kemenkes RI, 2024). In East Java, TB cases increased from 78,799 to 87,048, with Surabaya reporting the highest number of cases, totaling 10,987 in 2023 (Dinas Kesehatan Provinsi Jawa Timur, 2024).

Successful TB treatment depends heavily on patients' adherence to long-term anti-tuberculosis drug regimens. Drug resistance and treatment discontinuation remain major challenges in TB control and are further exacerbated by psychosocial barriers, such as social stigma, which places patients in vulnerable situations and may even result in job loss (De Fretes *et al*., 2024).

Sociocultural factors influencing TB treatment include cultural beliefs about the disease and patients' knowledge of its transmission mechanisms. Cultural beliefs and traditional practices may hinder healthcare-seeking behavior. In some cultures, TB is associated with non-biomedical conditions, leading patients to prefer traditional medicine over standard treatment (Alhassan *et al*., 2026).

A study involving patients with chronic diseases in Indonesia reported that 27.1% used traditional medicine alongside conventional medical treatment, driven by the perception that such treatments are

more natural, have fewer side effects, and are consistent with local cultural values (Pradipta *et al*., 2023; Purwitasari *et al*., 2023). However, their use becomes problematic when they replace conventional TB treatment because this may contribute to drug resistance. Furthermore, preference for traditional medicine has been identified as one of the factors associated with poor adherence to medical therapy among patients with TB (Rianto *et al*., 2024).

Although the use of traditional medicine and complementary products has been widely reported among the Indonesian population, specific documentation regarding the types and proportions of self-medication products used concurrently with anti-tuberculosis drugs (ATDs) by patients with TB at the community health center level remains very limited. Understanding these self-medication practices is important because some products may interact with ATDs or delay the initiation of effective treatment. Against this background, this study aimed to describe self-medication behavior among patients with TB receiving treatment at community health centers in Surabaya, with the expectation that the findings will serve as a reference for the development of contextual and evidence-based patient education.

METHODS

Study Design

This study employed a descriptive observational design to describe self-medication behavior among patients with TB receiving treatment at community health centers in Surabaya.

Study Participants and Data Collection

The study participants were adult patients with pulmonary TB aged ≥18 years who were receiving treatment at seven community health centers in Surabaya between September and December 2025. The participating health centers were selected based on institutional willingness to participate. According to the Tuberculosis Information System (SITB) database of the Surabaya City Health Office, the total study population comprised 232 patients. Participants were recruited using consecutive sampling, resulting

in 193 respondents who met the inclusion criteria. Patients younger than 18 years of age and those who were absent during the study visits were excluded. No eligible patients declined to participate.

Self-medication was defined as the use of any products other than anti-tuberculosis drugs (ATDs) during TB treatment, including herbal medicines, jamu (traditional Indonesian herbal medicine), vitamin supplements, and other products. Respondents were allowed to report more than one product. Data were collected through structured interviews using an interview guide developed by the researchers. The interviews were conducted face-to-face by the researchers, lasted an average of 10–15 minutes, and were not verified against medical records.

Data Analysis

Data were analyzed descriptively and presented as frequency distributions and percentages.

Ethical Approval

This study was approved by the Health Research Ethics Committee, Faculty of Pharmacy, Universitas Airlangga (Approval No. 31/LE/2025).

RESULTS AND DISCUSSION

Sociodemographic Characteristics of the Respondents

This study involved 193 patients with TB who were receiving treatment at the selected community health centers. The sociodemographic characteristics of the respondents are presented in Table 1.

***Table 1**. Sociodemographic Characteristics of the Respondents (n = 193)*

Characteristics	n	%
SEX		
Male	107	55%
Female	86	45%
AGE (YEARS)		
18-27	35	18%
28-37	32	17%
38-47	38	20%
48-57	37	19%
58-67	31	16%
>67	20	10%
EMPLOYMENT STATUS		
Unemployed	92	48%
Employed	101	52%
EDUCATIONAL ATTAINMENT		
No formal education	5	3%
Primary school	45	23%
Junior high school	40	21%
Senior high school	71	37%
Diploma/Bachelor's/Master's degree	12	6%
SMOKING HISTORY		
Current smoker	17	9%
Never smoked	131	68%
Former smoker (quit smoking during TB treatment)	45	23%
HISTORY OF COMORBIDITIES		

Characteristics	n	%
Yes	58	30%
No	135	70%

The prevalence of TB among male participants in this study was 55.4%, consistent with the literature indicating that men have a higher TB prevalence due to biological, behavioral, and social factors (Gupta *et al*., 2026). Men's tendency to prioritize work over their health, together with the influence of masculine norms, contributes to delays in seeking healthcare. In contrast, women tend to seek medical care more promptly, although they may face barriers such as dependence on male decision-making and social stigma (Muttamba *et al*., 2024).

More than half of the respondents were actively employed (52%). Activities outside the home involving frequent social contact increase the risk of exposure to *Mycobacterium tuberculosis* (Horna-Campos *et al*., 2011).

A total of 68% of the respondents had never smoked, 23% had quit smoking, and 9% were current smokers. Smoking nearly doubles the risk of *Mycobacterium tuberculosis* infection and accelerates the progression from latent TB infection to active disease through its immunosuppressive effects, which impair the body's immune response. Consequently, smokers are more likely to experience more severe clinical manifestations, including pulmonary cavitary lesions, delayed sputum conversion, and more extensive lung tissue damage (Altet *et al*., 2017).

History of TB Transmission

The distribution of respondents' history of TB transmission is presented in Table 2. Most respondents (66%) were unaware of the source of their TB infection. The high proportion of respondents who did not know the source of transmission indicates the need for more comprehensive education on the mechanisms of TB transmission.

Table 2. *History of Pulmonary TB Transmission*

History of Transmission	n	%
Household family member	30	16%
Friend or close relative	13	7%
Workplace or school contact	11	6%
Neighbor	12	6%
Unknown	127	66%

Self-medication Products Used by Patients

Of the 193 respondents, 114

(59%) reported practicing self-medication concurrently with anti-tuberculosis drugs (ATDs). The use of these products was driven by two complementary factors: recommendations or information provided by healthcare professionals for certain products, such as milk and vitamin supplements, and local beliefs and cultural practices supporting the use of traditional herbal products, such as honey, turmeric, and jamu. A complete list of the self-medication products used by the respondents is presented in Table 3 (n = 114).

Table 3. *Types of Additional Products Used by the Respondents (n = 114)*

Product Type	n	%
Vitamins and Supplements		
Vitamin B Complex	7	6%
Vitamin C	6	5%
Curcuma	6	5%
Iron supplement	2	2%
Others	4	4%
Traditional Herbal Products and Natural Ingredients		
Honey	15	13%
Turmeric	10	9%
Traditional Indonesian herbal medicine (jamu)	7	6%
Java turmeric (*Curcuma xanthorrhiza*)	5	4%
Others	10	9%
Milk Products		
Packaged milk	34	30%
Cow's milk	33	29%
Goat's milk / Etawa goat's milk	22	19%
Mare's milk	1	1%

Vitamin B complex and vitamin C were the most frequently consumed supplements, used by 6% and 5% of respondents practicing self-medication, respectively. The high consumption of vitamin B complex is likely associated with information provided by TB healthcare providers regarding its role in preventing adverse effects of anti-tuberculosis drugs (ATDs). This finding is consistent with the literature showing that vitamin B6 helps prevent isoniazid-induced sensory polyneuropathy and addresses vitamin B12 deficiency, which is commonly observed in patients with TB (Oh *et al*., 2017). Likewise, vitamin C was consumed by 5% of the respondents, supported by scientific evidence demonstrating its synergistic effects with ATDs through the generation of reactive oxygen species that directly kill *Mycobacterium tuberculosis* and enhance the host immune response (Cioboata *et al*., 2025).

Honey was the most frequently consumed herbal product (13%), reflecting the long-standing cultural belief among Indonesian communities that honey is a natural

remedy for various illnesses, including respiratory diseases, a practice that has been passed down through generations. This finding is consistent with the literature indicating that the flavonoids and polyphenols present in honey possess antioxidant and anti-inflammatory properties that may help reduce tissue damage associated with chronic inflammation in TB (Vohra *et al*., 2026). Nevertheless, more robust clinical evidence is still required to establish its effectiveness as a therapeutic agent in the context of TB.

Turmeric (9%), jamu (6%), and Java turmeric (*Curcuma xanthorrhiza*) (4%) were the next most frequently consumed herbal products. This pattern reflects the strong tradition of using medicinal plants in Indonesian culture, particularly in Java, where jamu has long been established as a preferred remedy for various health conditions, including among patients undergoing TB treatment (Purwitasari *et al*., 2023). Curcumin, the principal bioactive compound in turmeric, has been scientifically demonstrated to exhibit antibacterial activity against *Mycobacterium tuberculosis*, enhance bacterial clearance by macrophages, and, when combined with first-line anti-tuberculosis drugs, significantly reduce the pulmonary bacterial burden. In addition, curcumin has hepatoprotective effects that may reduce ATD-induced hepatotoxicity (Lara-Espinosa *et al*., 2025).

Milk products were the predominant self-medication products consumed in this study, with packaged milk (30%) and cow's milk (29%) being the most commonly used. This predominance is likely associated with the provision of free milk by community health centers to patients with TB who have low body weight as part of efforts to improve their nutritional status, in line with the World Health Organization (WHO) recommendations emphasizing the importance of nutritional support in TB management (WHO, 2024). However, milk consumption should be limited to pasteurized products, as unpasteurized milk may harbor *Mycobacterium bovis*, the causative agent of zoonotic tuberculosis, which can be transmitted through the

consumption of raw milk from infected animals (Collins *et al*., 2022).

Clinical Implications and the Role of Healthcare Professionals

Particular attention should be given to iron supplementation, as excessive iron may promote bacterial growth through iron sequestration mechanisms in patients with TB. Therefore, iron supplementation is not recommended without careful monitoring (Carver, 2018).

Although several self-medication products have demonstrated potential antimicrobial or immunomodulatory properties, the available evidence remains insufficient to recommend their use as a substitute for anti-tuberculosis drugs (ATDs), and their unsupervised use may delay effective treatment. Healthcare professionals should provide evidence-based patient education using a culturally sensitive approach that takes local beliefs and practices into account to improve TB treatment outcomes (Handayani *et al*., 2024; Nimah *et al*., 2023).

Study Limitations

This study has several limitations. The descriptive observational design does not allow causal relationships between self-medication behavior and TB treatment outcomes to be established. The inclusion of only seven community health centers in Surabaya limits the generalizability of the findings. In addition, the self-reported data may be subject to recall bias, as they were not verified against medical records.

CONCLUSION

A total of 59% of patients with TB in Surabaya reported using self-medication products concurrently with anti-tuberculosis drugs (ATDs), with milk products, vitamin B complex, vitamin C, honey, and turmeric being the most frequently consumed. The use of these products is likely associated with local cultural beliefs and community practices regarding traditional medicine. Therefore, healthcare professionals at community health centers should emphasize evidence-based patient education that is sensitive to local cultural contexts to prevent delays in treatment and improve TB treatment outcomes.

ACKNOWLEDGMENTS

The authors would like to express their sincere gratitude to Abdul Rahem and Yuni Priyandani for their guidance throughout the study, to the directors and staff of the selected community health centers in Surabaya for granting permission to conduct data collection, and to all respondents for their participation.

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