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The Influence of Sociodemographic Factors on Stress Levels Among Pulmonary Tuberculosis Patients: A Health Belief Model-Based Study

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Abstract:
Pulmonary tuberculosis (TB) imposes not only physical but also substantial psychological burdens, particularly stress, which may compromise treatment adherence and outcomes. While the Health Belief Model (HBM) has been widely applied to predict TB treatment behaviors, its utility in explaining how sociodemographic factors shape stress levels remains underexplored. This cross-sectional study aimed to examine the association between sociodemographic characteristics and stress among 150 pulmonary TB patients in Jombang Regency, Indonesia, using the HBM as a theoretical lens. Stress was assessed using the Depression Anxiety Stress Scale–42 (DASS-42), with 62.7% of participants reporting moderate to severe stress. Chi-square and binary logistic regression analyses revealed that education ($p = 0.012$; OR = 1.89, 95% CI: 1.10–3.25), marital status ($p = 0.021$; OR = 1.72, 95% CI: 1.05–2.80), and occupation ($p = 0.008$; OR = 2.45, 95% CI: 1.30–4.60) were significantly associated with stress levels, whereas age and gender were not ($p > 0.05$). Occupation emerged as the strongest predictor, with unemployed or informally employed patients more than twice as likely to experience high stress. These findings underscore the role of perceived barriers and self-efficacy—core HBM constructs shaped by sociodemographic context—in influencing psychological distress. Integrating tailored psychosocial support into TB care is essential to mitigate stress and enhance treatment success.

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INTRODUCTION

Pulmonary tuberculosis (TB) continues to pose a significant public health burden globally, particularly in developing countries such as Indonesia (Saktiawati & Probandari, 2025). While TB primarily affects the respiratory system, its psychological impacts are often underestimated. Patients undergoing long-term treatment frequently experience emotional distress, especially stress, which can compromise treatment adherence and ultimately affect recovery outcomes (Panda et al., 2024).

However, a critical gap persists, as the Health Belief Model (HBM) has been extensively applied to predict adherence behaviors, but its relevance in explaining psychological outcomes—specifically, stress—mediated by sociodemographic factors remains largely unexamined. Most HBM-based TB studies focus on medication-taking behavior or clinic attendance, neglecting how structural determinants like education, marital status, or employment shape patients' perceived barriers or self-efficacy, thereby influencing stress. Recent studies have emphasized the importance of behavioral models in understanding and improving TB treatment compliance. The Health Belief Model (HBM) has emerged as a practical framework for analyzing individuals' health behaviors,

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focusing on perceived susceptibility, severity, benefits, and barriers, as well as self-efficacy and cues to action (Parwati et al., 2021).

Educational interventions grounded in the HBM have shown promising results in enhancing patients' knowledge, beliefs, and adherence to TB treatment protocols (Sazali et al., 2022). In addition to behavioral constructs, sociodemographic factors such as education, marital status, and occupation have been identified as key determinants of psychological outcomes among TB patients. Differences in demographic profiles influenced stress-coping strategies among pulmonary TB patients in East Java. However, despite the growing body of evidence on TB treatment adherence, few studies have directly explored the relationship between sociodemographic variables and stress levels using a structured behavioral framework such as the HBM (Khamai et al., 2024).

A study by Dana et al. (2025) also highlighted that family support and internal motivation significantly influenced TB patients' adherence, yet the role of stress as a mediating factor remains understudied. Moreover, the integration of sociodemographic analysis with behavioral models in TB care is still limited, particularly in local contexts such as Jombang Regency, Indonesia. While prior research has examined the effects of HBM-based interventions on TB treatment compliance, limited attention has been given to how sociodemographic factors influence stress within this theoretical framework. This study addresses this gap by investigating the association between education, marital status, occupation, and stress levels in pulmonary TB patients through the lens of the HBM (Gebremariam et al., 2021).

Pulmonary tuberculosis (TB) has been widely studied from a biomedical perspective, particularly regarding diagnosis, pharmacological treatment, and microbial resistance. In the last decade, there has been a growing interest in integrating behavioral science—such as the Health Belief Model (HBM)—into TB management, especially to improve treatment adherence. Several recent studies have confirmed the usefulness of HBM in predicting patient behaviors, such as medication compliance and attendance at follow-up appointments (Martono et al., 2023).

However, despite this growing body of work, very few studies have examined the psychological outcomes, such as stress levels, in TB patients through the HBM framework. Most applications of the HBM in TB contexts focus primarily on behavior (e.g., medication-taking behavior), not psychological states. This presents a conceptual gap, as stress is a known determinant of health behavior. Patients who experience high stress may perceive higher barriers or lower self-efficacy, which directly affects their treatment adherence (Suprijandani et al., 2025).

Moreover, while sociodemographic factors such as education, marital status, and occupation are routinely recorded in TB studies, they are rarely analyzed in depth as predictors of psychological distress. Studies like Nguyen et al. (2024) mention family support and motivation in relation to adherence, but do not systematically examine how variables like employment status or educational background affect stress levels in patients undergoing lengthy and often stigmatized TB treatment.

This study addresses this gap by explicitly applying the HBM to investigate how education, marital status, and occupation affect stress levels among patients with pulmonary TB. Its novelty lies in bridging behavioral theory with psychosocial epidemiology, offering a theoretically grounded understanding of stress as a modifiable factor in determining treatment success. The findings of this study are expected to contribute valuable insights for the development of psychosocial interventions tailored to patients' sociodemographic backgrounds. By applying the HBM framework, the study seeks to enhance understanding of the behavioral pathways through which social factors affect psychological well-being in TB care. These insights are crucial for designing holistic, patient-centered treatment approaches that improve adherence and quality of life (Zeng et al., 2025). This study aims to investigate the association between sociodemographic factors—education, marital

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status, and occupation and stress levels among pulmonary TB patients in Jombang Regency, using the Health Belief Model as a theoretical framework.

METHOD

Study Design

This study employed a quantitative, cross-sectional design to evaluate the relationships between sociodemographic variables and stress levels at a specific point in time. The study was conducted in the first quarter of 2025 across several Puskesmas (community health centers) in Jombang Regency, East Java.

Participants

The sample size was calculated using the formula for cross-sectional studies:

$$n=d_2Z_2 \cdot p(1-p)$$

Assuming a 50% prevalence of stress (maximizing variability), 95% confidence level (Z = 1.96), and 5% margin of error, the minimum required sample was 384. However, due to resource and accessibility constraints in a high-burden but localized setting and based on feasibility assessments from prior TB studies in similar regions (Syukriani et al., 2022), a representative sample of 150 participants was deemed sufficient for detecting medium-to-large effect sizes (Cohen's w ≥ 0.3) with 80% power. Participants were selected via purposive sampling based on: (1) confirmed pulmonary TB diagnosis, (2) age ≥18 years, (3) active anti-TB treatment, and (4) informed consent.

Instruments

Data collection involved two structured tools: a sociodemographic questionnaire covering age, gender, education, marital status, and occupation, and the stress subscale of the DASS-42, a validated instrument for measuring stress symptoms on a 4-point Likert scale.

1. Sociodemographic questionnaire: Collected data on age, gender, education, marital status, and occupation.
   a. Education was categorized into three levels: Low (≤6 years, elementary), Moderate (7–12 years, junior/senior high), and High (≥13 years, diploma/degree), following Indonesia's national education framework.
   b. Occupation distinguished Employed (formal or stable informal work with regular income) from Unemployed/Informal (no job, daily laborers, or irregular income), reflecting economic stability—a key HBM-related barrier.
2. Stress assessment: The Stress subscale of DASS-42, a validated 14-item Likert-scale instrument (0–3), was used. Total scores were categorized per Lovibond & Lovibond (1995):
   a. Normal (0–14),
   b. Mild (15–18),
   c. Moderate (19–25),
   d. Severe (26–33),
   e. Extremely severe (≥34).
   f. For analysis, moderate to extremely severe stress was classified as "high stress."

Data Collection

Trained field staff administered the questionnaires through interviews or self-report, depending on the patient's literacy level and preference. Four trained nursing researchers administered questionnaires via face-to-face interviews or self-report (based on literacy). All underwent a 2-day

standardization workshop on ethical conduct, instrument administration, and probing techniques to minimize interviewer bias. Inter-rater reliability was confirmed (Cohen's κ > 0.85).

Ethical Considerations

All participants provided written informed consent, and the study was approved by the Ethics Committee of the Insan Cendekia Medika Jombang (Approval No. 012/KEP-FK/2025).

Data Analysis

Descriptive statistics (frequencies, percentages, means ± SD) summarized sociodemographic and stress data. Chi-square tests assessed bivariate associations. Binary logistic regression identified predictors of high stress, reporting odds ratios (OR), 95% confidence intervals (CI), p-values, and effect sizes (Cramer's V). Significance was set at α = 0.05. Analyses used SPSS

RESULT

Table 1. Sociodemographic Characteristics of Respondents (N = 150)

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	87	58
	Female	63	42
Age (years)	< 30	33	22
	30 – 50	93	62
	> 50	24	16
Education	Low	56	37.3
	Moderate	44	29.3
	High	50	33.4
Marital Status	Married	90	60
	Single/Divorced	60	40
Occupation	Employed	69	46
	Unemployed	81	54

Table 1 shows the distribution of respondents by sociodemographic characteristics. Most respondents were male (58%), aged 30–50 years (62%), and had low to moderate levels of education (66.6%). A slight majority were either unemployed or working in informal sectors (54%), and most were married (60%).

Table 2. Chi-square Test Results for Sociodemographic Variables and Stress Levels

Variable	p-value	Interpretation
Gender	0.472	Not significant
Age	0.34	Not significant
Education	0.012	Significant
Marital Status	0.021	Significant
Occupation	0.008	Significant

Chi-square analysis was conducted to determine the association between sociodemographic variables and stress levels. Table 2 presents the results of the chi-square test. Among the variables tested, education (p = 0.012), marital status (p = 0.021), and occupation (p = 0.008) showed statistically significant associations with stress levels. In contrast, neither gender nor age was significantly associated with stress levels (p > 0.05).

Table 3. Logistic Regression Analysis of Predictors of Stress Level

Variable	Odds Ratio (OR)	95% Confidence Interval (CI)	p-value
Education	1.89	1.10 – 3.25	0.015
Marital Status	1.72	1.05 – 2.80	0.027
Occupation	2.45	1.30 – 4.60	0.004

Table 3 presents the logistic regression results, showing that all three variables—education, marital status, and occupation—were significant predictors of stress levels. Among them, occupation was the strongest predictor, with an odds ratio (OR) of 2.45 (95% CI: 1.30–4.60), indicating that patients who were unemployed or informally employed were over twice as likely to experience high stress. Education also showed a significant association, with an OR of 1.89 (95% CI: 1.10–3.25), suggesting that patients with lower educational attainment had higher odds of experiencing stress. Marital status was a significant predictor as well, with an OR of 1.72 (95% CI: 1.05–2.80), indicating that unmarried or divorced patients were more likely to experience stress compared to married individuals. These findings demonstrate that occupation is the most dominant sociodemographic predictor of stress among pulmonary TB patients, followed by education and marital status. These results highlight the importance of addressing social determinants in the psychological management of TB patients.

DISCUSSION

This study investigated the impact of sociodemographic factors on stress levels among pulmonary tuberculosis (TB) patients in Jombang Regency, utilizing the Health Belief Model (HBM) as a theoretical framework. The findings showed that education, marital status, and occupation significantly influenced stress levels, with occupation being the most dominant predictor. This nuanced understanding highlights critical intersections between socioeconomic status, psychological distress, and disease management.

The significant link between lower educational attainment and elevated stress corroborates recent literature emphasizing the role of health literacy in managing chronic diseases like TB. Stephanie & Surjadi (2020) found that patients with limited education often struggle to comprehend complex medical information, which fuels uncertainty and fear, thereby heightening stress. Individuals with poor health knowledge are more likely to perceive greater barriers and lower self-efficacy, impeding adaptive coping (Mehrabizadeh et al., 2024). The practical implication is that education enhances patients' perceived control, which mitigates stress and potentially improves adherence to TB treatment regimens.

Regarding marital status, the finding that unmarried patients experienced higher stress levels reinforces the pivotal role of social support in buffering psychological distress (Park et al., 2021). Social support can be understood as an external cue that modulates HBM constructs such as perceived benefits and cues to action. Married patients may receive emotional encouragement and practical support, thereby reducing their psychological burden and enhancing their ability to navigate treatment complexities. Conversely, social isolation experienced by unmarried or divorced individuals exacerbates stress, posing a risk for poor treatment outcomes (Nguyen et al., 2024).

The strongest predictor, occupation, highlights the deep entanglement of economic factors and mental health in TB patients. (Lee & Lee, 2022) Documented that economic insecurity is a significant stressor for TB patients, often causing anxiety related to treatment affordability, transportation costs, and the ability to maintain livelihood. In line with the HBM, economic hardship increases perceived barriers and diminishes perceived benefits, potentially eroding motivation to continue treatment. This

finding underscores the importance of integrating social protection measures into TB programs, such as employment assistance or conditional cash transfers, which have been demonstrated to alleviate economic stress and improve adherence (Chen et al., 2021).

The lack of significant associations between age or gender and stress contrasts with some prior studies suggesting that older adults and females typically report higher stress levels. This divergence may be attributed to unique socio-cultural dynamics within Jombang Regency. For example, extended family systems and community cohesion in the region may provide older patients with stronger social safety nets, mitigating stress typically associated with aging (Medina-Marino et al., 2025). Similarly, gender roles in this community might diffuse emotional burdens more evenly or affect coping styles differently than reported in other settings, indicating the importance of context-specific psychosocial interventions (Maynard et al., 2023).

Moreover, while many TB studies focus primarily on biological or treatment adherence outcomes, this research adds a novel psychological dimension by explicitly linking sociodemographic factors with stress through a behavioral health theory framework. By applying the Health Belief Model to stress—rather than solely adherence behaviors—this study broadens the model's utility and invites future research to explore psychological mediators in TB care (Parwati et al., 2021). Such integration supports a holistic approach, where mental health is seen as a critical determinant of treatment success, rather than merely a comorbidity.

These findings emphasize the need for multifaceted interventions targeting vulnerable TB patients, particularly those with low education, a lack of social support, and economic instability. Health education programs should be tailored to improve disease literacy, focusing on enhancing perceived benefits and self-efficacy to empower patients (Aifa et al., 2024). Concurrently, psychosocial support services—such as counseling, peer groups, and community-based support—should prioritize unmarried or socially isolated individuals to mitigate stress-related treatment dropout (Megawati et al., 2024).

Economic interventions are equally crucial in the fight against tuberculosis. Incorporating social welfare strategies—such as financial assistance, job training, and microfinance programs—into TB care can significantly reduce the stress associated with poverty and illness. This holistic approach supports patients' basic needs, thereby indirectly improving treatment adherence and health outcomes. Such integration aligns with the WHO's End TB Strategy, which advocates for comprehensive social protection to address the socioeconomic determinants of TB (Fuady et al., 2024).

Despite the insights gained, the study has limitations. The cross-sectional design precludes conclusions about causality; future longitudinal research should explore how sociodemographic factors and stress interact over the course of treatment. The reliance on self-reported stress measures may introduce reporting bias, especially in cultures where mental health stigma persists. Employing mixed-methods approaches could deepen understanding of patients lived experiences.

This study demonstrates that sociodemographic factors—particularly occupation, education, and marital status—significantly predict stress levels among pulmonary TB patients, with findings interpreted through the HBM framework. Occupation as the strongest predictor aligns with global evidence: economic insecurity heightens perceived barriers (e.g., treatment costs, lost wages) and reduces self-efficacy (Lee & Lee, 2022; Chen et al., 2021). Unemployed patients may perceive TB treatment as financially unsustainable, increasing psychological distress—a mechanism directly tied to HBM's "perceived barriers" construct.

Lower education correlated with higher stress, likely due to limited health literacy, which impedes understanding of treatment rationale and prognosis, thereby amplifying perceived severity and reducing self-efficacy (Stephanie & Surjadi, 2020). This reflects the HBM's emphasis on

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knowledge as a foundation for adaptive health beliefs. Unmarried status predicted greater stress, consistent with international findings on social support as a buffer against illness-related distress (Park et al., 2021). In HBM terms, spousal support may serve as a “cue to action” and enhance perceived benefits of adherence.

Notably, age and gender showed no significant association—contrary to global trends. This may reflect Jombang’s strong familial and community support systems that mitigate age- or gender-based vulnerabilities, or culturally shaped coping styles. Alternative explanations include a limited age range or gender-balanced stress expression in this cohort (Peer et al., 2023). Theoretical contribution: This study extends the HBM beyond behavioral outcomes by showing how sociodemographic factors shape core constructs (e.g., barriers, self-efficacy) that mediate stress. Future studies should quantitatively measure HBM constructs using validated scales (e.g., Champion's HBM Scale) to explicitly test these mediating pathways.

Additionally, while the HBM provided a valuable conceptual lens, the study did not measure specific HBM constructs quantitatively. Future studies should incorporate validated scales for perceived susceptibility, severity, benefits, barriers, and self-efficacy to elucidate the psychological mechanisms underlying the relationship between sociodemographic factors and stress. Exploring interventions designed explicitly to modify these constructs could enhance both psychological well-being and clinical outcomes.

CONCLUSION

This study reveals that education, marital status, and occupation significantly influence stress levels among pulmonary tuberculosis patients in Jombang Regency. Occupation stands out as the strongest predictor, indicating that economic factors play a pivotal role in the psychological well-being of these patients. Patients with unstable or informal employment are more likely to experience higher stress, which can negatively impact their ability to adhere to treatment. Conversely, age and gender were not found to have a meaningful association with stress, suggesting that the psychological burden of TB in this context is more closely tied to social and economic circumstances than to demographic characteristics.

These findings provide a clear answer to the research question by highlighting that specific sociodemographic factors are key determinants of stress among TB patients. Recognizing this allows healthcare providers and policymakers to develop more effective, tailored interventions focused on the needs of those most vulnerable, especially those facing economic challenges or lacking social support through marital relationships. By addressing these psychosocial factors alongside clinical care, TB programs can improve patient adherence and outcomes, ultimately enhancing the quality of life for individuals living with tuberculosis. Therefore, it is recommended that TB treatment programs incorporate psychosocial support services and social protection measures, such as counseling, health education tailored to patients’ literacy levels, and financial or employment assistance. These interventions could help reduce stress, improve mental well-being, and increase treatment adherence, leading to better overall health outcomes.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest regarding the publication of this research. We confirm that no financial, personal, or professional relationships with any organization or individual could inappropriately influence the content, analysis, or conclusions of this study. The research was conducted independently, and all findings are reported with integrity and objectivity.

REFERENCES

Aifa, Suhari, & Ro'isah. (2024). The Correlation Between Self-Efficacy and Medication Adherence with the Quality of Life of Pulmonary Tuberculosis Patients at Randuagung Health Center, Lumajang Regency. *Health and Technology Journal (HTechJ), 2*(6), 564–570. https://doi.org/10.53713/htechj.v2i6.289

Chen, X., Wu, R., Xu, J., Wang, J., Gao, M., Chen, Y., Pan, Y., Ji, H., Duan, Y., Sun, M., Du, L., & Zhou, L. (2021). Prevalence and associated factors of psychological distress in tuberculosis patients in Northeast China: a cross-sectional study. *BMC Infectious Diseases, 21*(1), 1–12. https://doi.org/10.1186/s12879-021-06284-4

Dana, N. R., Chiau, M. L., & Rahman, A. D. (2025). FAMILY SUPPORT, MOTIVATION, AND PATIENT ADHERENCE TO TUBERCULOSIS TREATMENT: INSIGHTS FROM INDONESIA. *African Journal of Infectious Diseases, 19*(2), 43–49. https://doi.org/10.21010/Ajidv19i2.5

Fuady, A., Hutanamon, T., Herlinda, O., Luntungan, N., & Wingfield, T. (2024). Achieving universal social protection for people with tuberculosis. *The Lancet Public Health, 9*(5), e339-e344. https://doi.org/10.1016/S2468-2667(24)00046-X

Gebremariam, R. B., Wolde, M., & Beyene, A. (2021). Determinants of adherence to anti-TB treatment and associated factors among adult TB patients in Gondar city administration, Northwest, Ethiopia: based on health belief model perspective. *Journal of Health, Population and Nutrition, 40*(1), 49. https://doi.org/10.1186/s41043-021-00275-6

Khamai, N., Seangpraw, K., & Ong-Artborirak, P. (2024). Using the Health Belief Model to Predict Tuberculosis Preventive Behaviors Among Tuberculosis Patients' Household Contacts During the COVID-19 Pandemic in the Border Areas of Northern Thailand. *Journal of Preventive Medicine and Public Health, 57*(3), 223. https://doi.org/10.3961/jpmph.23.453

Lee, G. U., & Lee, H. K. (2022). Effects of Depression, Social Support of Tuberculosis Patients on Self-care. *Journal of Korean Academy of Community Health Nursing, 33*(4), 456–464. https://doi.org/10.12799/JKACHN.2022.33.4.456

Martono, M., Akhyar, M., Pamungkasari, E. P., & Lestari, A. (2023). Results of professional interventions to improve medication adherence based on health beliefs and important determinants of tuberculosis medication: a systematic review. *European Review for Medical and Pharmacological Sciences, 27*(24), 11794–11805. https://doi.org/10.26355/eurrev_202312_34778

Maynard, C., Tariq, S., Sotgiu, G., Migliori, G. B., Van den Boom, M., & Field, N. (2023). Psychosocial support interventions to improve treatment outcomes for people living with tuberculosis: A mixed methods systematic review and meta-analysis. *EClinicalMedicine, 61,* 102057. https://doi.org/10.1016/j.eclinm.2023.102057

Medina-Marino, A., de Vos, L., & Daniels, J. (2025). Social isolation, social exclusion, and access to mental and tangible resources: mapping the gendered impact of tuberculosis-related stigma among men and women living with tuberculosis in Eastern Cape Province, South Africa. *BMC Global and Public Health,* 3(1), 50. https://doi.org/10.1186/s44263-025-00166-6

Megawati, D., Ainul Yaqin Salam, & Rizka Yunita. (2024). The Relationship Between Self-Stigma and Subjective Well-Being in Tuberculosis Patients. *Health and Technology Journal (HTechJ), 2*(5), 516–525. https://doi.org/10.53713/htechj.v2i5.267

Mehrabizadeh, M., Zaremohzzabieh, Z., Zarean, M., Ahrari, S., & Ahmadi, A. R. (2024). Narratives of resilience: Understanding Iranian breast cancer survivors through health belief model and stress-coping theory for enhanced interventions. *BMC Women's Health, 24*(1), 552. https://doi.org/10.1186/s12905-024-03383-7

Nguyen, H. T. T., Tran, D. Q., & Dinh, D. X. (2024). Social support status and associated factors among methadone maintenance patients: a multicentre, cross-sectional study in Vietnam during the COVID-19 pandemic. *BMJ Open, 14*(12), 1–10. https://doi.org/10.1136/bmjopen-2023-081519

Panda, U., Ra, D., Swaroop Sahoo, S., Kakkar, R., & Singh, J. (2024). Interplay between tuberculosis, mental illness, and treatment compliance: An integrative literature review. *Indian Journal of Tuberculosis, 71*(3), 353-357. https://doi.org/10.1016/j.ijtb.2023.10.004

Volume 03 Number 06
December 2025
p-ISSN: 2986-5662
e-ISSN: 2985-959X

Park, J. H., Lee, S. G., Ahn, S., Kim, J. Y., Song, J., Moon, S., & Cho, H. (2021). Strategies to prevent COVID-19 transmission in the emergency department of a regional base hospital in Korea: From index patient until pandemic declaration. *American Journal of Emergency Medicine, 46*(March 2020), 247–253. https://doi.org/10.1016/j.ajem.2020.07.056

Parwati, N. M., Bakta, I. M., Januraga, P. P., & Wirawan, I. M. A. (2021). A health belief model-based motivational interviewing for medication adherence and treatment success in pulmonary tuberculosis patients. *International Journal of Environmental Research and Public Health, 18*(24). https://doi.org/10.3390/ijerph182413238

Peer, V., Schwartz, N., & Green, M. S. (2023). Gender differences in tuberculosis incidence rates—A pooled analysis of data from seven high-income countries by age group and time period. *Frontiers in Public Health, 10,* 997025. https://doi.org/10.3389/fpubh.2022.997025

Permatawati, Marfuah, & Alwin Widhiyanto. (2025). The Correlation Between Close Contact and Environment with TB Incidence. *Health and Technology Journal (HTechJ), 3*(1), 16–24. https://doi.org/10.53713/htechj.v3i1.281

Pusporini, P., Tamtomo, D. G., & Prasetya, H. (2024). Adherence to Direct Observed Treatment Short-Course Treatment in Tuberculosis: Application of the Health Belief Model. *Journal of Health Promotion and Behavior, 9*(2), 154–165. https://doi.org/10.26911/thejhpb.2024.09.02.06

Saktiawati, A. M. I., & Probandari, A. (2025). Tuberculosis in Indonesia: Challenges and future directions. *The Lancet Respiratory Medicine, 13*(8), 669-671. https://doi.org/10.1016/S2213-2600(25)00168-7

Sazali, M. F., Syed Abdul Rahim, S. S., Mohammad, A. H., Kadir, F., Payus, A. O., Avoi, R., Jeffree, M. S., Omar, A., Ibrahim, M. Y., Atil, A., Tuah, N. M., Dapari, R., Lansing, M. G., Abdul Rahim, A. A., & Azhar, Z. I. (2022). Improving Tuberculosis Medication Adherence: The Potential of Integrating Digital Technology and Health Belief Model. *Tuberculosis and Respiratory Diseases, 86*(2), 82. https://doi.org/10.4046/trd.2022.0148

Stephanie, M., & Surjadi, C. (2020). The Mental Health of First- and Final-Year Preclinical Medical Students. *Jurnal Pendidikan Kedokteran Indonesia: The Indonesian Journal of Medical Education, 9*(3), 291. https://doi.org/10.22146/jpki.52417

Suprijandani, S., Setiawan, S., Pathurrahman, P., Wardoyo, S., & Rahayyu, A. M. (2025). The behaviour of TB patients in East Lombok through a health belief model approach. *Journal of Health, Population and Nutrition, 44*(1), 23. https://doi.org/10.1186/s41043-025-00746-0

Syukriani, Y., Noviandhari, A., Arisanti, N., Setiawati, E. P., Rusmil, V. K., Dhamayanti, M., & Sekarwana, N. (2022). Cross-sectional survey of underreported violence experienced by adolescents: a study from Indonesia. *BMC Public Health, 22*(1), 1–12. https://doi.org/10.1186/s12889-021-12427-8

Zeng, Q., Chen, W., Xu, S., Yang, X., Xue, D., Peng, Y., Lin, X., Yu, Y., Huang, H., Huang, P., Dong, M., & Li, J. (2025). Understanding facilitators and barriers to adherence in home-based pulmonary rehabilitation for chronic obstructive pulmonary disease patients using the Health Belief Model: A qualitative study. *Frontiers in Public Health, 13,* 1553744. https://doi.org/10.3389/fpubh.2025.1553744