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The relationship between family support and improved nutritional status in Tuberculosis (TB) patients

Hubungan dukungan keluarga dengan peningkatan status gizi pada pasien Tuberculosis (TBC)

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Abstract

Tuberculosis (TB) is an infectious disease that substantially affects the nutritional status of patients. Family support is believed to contribute to improved nutritional outcomes during the treatment. This study aimed to determine the relationship between family support and improvements in the nutritional status among TB patients with TB. A quantitative study with a cross-sectional design was conducted between May and June 2024, involving 44 patients with TB at the Langkahan Primary Health Center, North Aceh. Data were collected using a validated questionnaire that assessed four dimensions of family support and nutritional status. The Chi-square test was used for data analysis ($p < 0.05$). A total of 75% of the patients demonstrated improvements in their nutritional status. Overall family support was significantly associated with improved nutritional status ($p = 0.013$; OR = 7.875; 95% CI: 1.733–35.785), and all support dimensions showed significant relationships ($p < 0.05$). These findings indicate that family support plays an essential role in enhancing the nutritional status of patients with TB. Strengthening family based interventions is recommended to support nutritional recovery and successful treatment.

Keywords: Family support, nutritional status, tuberculosis

Abstrak

Tuberkulosis (TBC) merupakan penyakit menular yang berdampak pada penurunan status gizi pasien. Dukungan keluarga diyakini berperan dalam membantu perbaikan status gizi selama proses pengobatan. Penelitian ini bertujuan mengetahui hubungan antara dukungan keluarga dengan peningkatan status gizi pada pasien TBC. Penelitian kuantitatif dengan desain cross-sectional ini dilaksanakan pada Mei–Juni 2024 melibatkan 44 pasien TBC di UPTD Puskesmas Langkahan, Aceh Utara. Data dikumpulkan menggunakan kuesioner tervalidasi yang mencakup empat dimensi dukungan keluarga dan status gizi. Analisis dilakukan menggunakan uji Chi-Square ($p < 0,05$). Sebanyak 75% pasien mengalami peningkatan status gizi. Terdapat hubungan signifikan antara dukungan keluarga secara keseluruhan dengan peningkatan status gizi ($p = 0,013$; OR = 7,875; CI 95%: 1,733–35,785), dan seluruh dimensi dukungan keluarga juga menunjukkan hubungan bermakna ($p < 0,05$). Temuan ini menunjukkan bahwa dukungan keluarga berperan penting dalam meningkatkan status gizi pasien TBC. Penguatan intervensi berbasis keluarga direkomendasikan untuk mendukung pemulihan gizi dan keberhasilan terapi

Kata Kunci: Dukungan keluarga, status gizi, tuberkulosis

Introduction

Tuberculosis (TB) remains a serious global public health issue. According to the 2022 WHO report, TB continues to be the leading infectious cause of death worldwide, with millions of new cases annually, despite extensive global control efforts (Bagcchi, 2023; Litvinjenko et al., 2023).

Although TB primarily affects the lungs, its burden extends to a diminished quality of life and nutritional deterioration, particularly in low-resource settings. Factors such as poverty, overcrowding, and limited access to healthcare further exacerbate TB outcomes among vulnerable populations.

In Indonesia, TB remains a major public health challenge, with the country ranking second highest globally in terms of TB incidence after India (Suryati & Adewale, 2024). This burden is compounded by underreporting and gaps in case detection, particularly in the private sector (Surya et al., 2017). Socioeconomic barriers, including malnutrition, poverty, and limited healthcare access, continue to contribute to high morbidity and mortality (Fahdhienie et al., 2024). Thus, strengthening TB management requires the integration of medical treatment with nutritional and social support approaches.

Poor nutritional status is a significant risk factor for TB progression. Malnourished patients with TB experience immune suppression, making them more susceptible to complications (Wijayanto et al., 2024). Conversely, active TB increases metabolic needs and reduces appetite, leading to a worsening nutritional status (Simieneh et al., 2024). This bidirectional relationship highlights the importance of nutritional support as an essential component of TB therapy, as evidence shows that it can enhance immune response, support recovery, and improve treatment outcomes (Khalid, 2021).

The recovery of patients' nutritional status depends not only on clinical treatment but also on social determinants, especially family support. The family serves as the primary support system that helps ensure adequate nutrition, treatment adherence, and supervision during therapy. Family support encompasses emotional, instrumental, informational, and appraisal components, which collectively contribute to fulfilling patients' nutritional and treatment needs (Al Rahmad & Shavira, 2024; Alinaitwe et al., 2025b). Lahuo et al. (2024) emphasized that families with adequate knowledge of nutrition and treatment are better equipped to assist patients with TB effectively, thereby enhancing recovery and nutritional improvement.

Emotional support provides empathy and motivation (Alinaitwe et al., 2025a), instrumental support ensures the availability of daily necessities and nutritious food, informational support strengthens patients' understanding of therapy and nutrition (Lahuo et al., 2024), and appraisal support reinforces confidence and treatment engagement (Nursasi et al., 2022). These forms of support work synergistically and have been associated with improved adherence and better nutritional outcomes in patients with TB.

Previous studies have demonstrated that patients with strong family support show improved nutritional intake, higher treatment adherence, and more favorable clinical outcomes than those with limited support (Lutfian et al., 2025; Mochartini, 2022; Mudigdo & Adriani, 2017; Puspitasari et al., 2017). This study aimed to determine the relationship between family support and improvements in the nutritional status among TB patients with TB.

Methods

This quantitative study employed a correlational approach with a cross-sectional design to determine the relationship between family support and improvements in the nutritional status of patients with tuberculosis (TB). The study was conducted from May to June 2024 at the Langkahan Primary Health Center, Langkahan District, North Aceh Regency.

The study population comprised 50 patients with TB registered in the treatment register at the Langkahan Primary Health Center between 2021 and 2023. A total sampling technique was used, in which all individuals who met the inclusion criteria were invited to participate. Based on these criteria, 44 respondents were included in the study.

The inclusion criteria were as follows: (1) patients with TB who were undergoing or had completed at least one month of therapy; (2) willingness to participate and sign informed consent; (3) ability to communicate effectively; and (4) accompanied by a family member during treatment. The exclusion criteria were as follows: cognitive impairment, severe mental disorders, and unavailability during data collection.

The study instrument consisted of a closed questionnaire that underwent validity and reliability testing. The questionnaire included two components: (1) a family support questionnaire covering four dimensions

emotional, instrumental, informational, and appraisal support; and (2) an assessment of nutritional status.

To improve the measurement precision, nutritional status was assessed using anthropometric indicators rather than weight change alone. Anthropometric data included Body Mass Index (BMI), calculated from measured body weight and height using standardized digital scales and stadiometers, and Mid-Upper Arm Circumference (MUAC) as an additional indicator of nutritional adequacy. Measurements were conducted using calibrated instruments, following standard TB nutritional assessment procedures. Nutritional status was categorized as "improved" if BMI or MUAC increased, based on the national TB nutrition monitoring guidelines, supported by medical record verification when available.

Each family support item was measured using a 4-point Likert scale ("never" to "always"). Nutritional status was classified as either improved or not improved based on objective changes in BMI or MUAC, and cross-validated with assessments by nutrition officers at the Primary Health Center.

Data were collected through interviews using a validated questionnaire, anthropometric measurements, and medical record extraction. The study's purpose and procedures were explained to all the respondents prior to data collection.

Potential confounders, including age, sex, baseline nutritional status, duration of TB treatment, and comorbid conditions, were considered descriptively to assess their influence on the relationship between family support and nutritional improvement. Although multivariate analysis was not conducted, confounding factors were addressed by stratifying the descriptive results and assessing homogeneity between the comparison groups to reduce bias.

Data were analyzed using univariate statistics to describe variable distributions and bivariate statistics using the chi-square test to examine the relationship between family support (overall and by dimension) and improved nutritional status. The significance level was set at $p < 0.05$. Ethical approval was obtained from the Health Research Ethics Committee of the Faculty of Medicine (approval no. 081/EA/FK/2025).

Result and Discussion

A total of 44 patients with TB participated in the study. Most respondents were aged 30–49 years (50%), followed by those aged ≥50 years (27.3%) and <30 years (22.7%). The majority of patients were male (59.1%). Regarding family support, 70.5% of the respondents reported receiving adequate overall support, whereas 29.5% reported receiving inadequate support.

By type of support, 31.8% of participants received adequate emotional and instrumental support, while 29.5% reported receiving adequate informational support. Appraisal support was the most frequently reported, with 40.9% of respondents indicating that they received adequate support. Regarding treatment adherence, 75% of the participants were compliant with their TB therapy, while 25% were non-compliant.

Bivariate analysis revealed significant associations between all types of family support and TB treatment adherence ($p = 0.001$). Interestingly, respondents with inadequate emotional support demonstrated higher adherence (93.3%) than those with adequate emotional support (35.7%). Similar significant relationships were observed for instrumental, informational, and appraisal support.

General family support also demonstrated a strong association with adherence: 81.8% of those with adequate family support were adherent, compared with only 36.4% of those with inadequate support. The Chi-square test indicated statistical significance ($p = 0.013$), suggesting that patients with adequate family support were nearly eight times more likely to adhere to treatment and experience improvements in nutritional status during therapy (Table 2).

Table 1. Respondent characteristics (n=44)

Characteristics	n	%
Age		
< 30 years	10	22.7
30–49 years	22	50
≥ 50 years	12	27.3
Gender		
Male	26	59.1
Female	18	40.9
Family support		
Inadequate	13	29.5
Adequate	31	70.5
Emotional support		
Inadequate	30	68.2
Adequate	14	31.8
Instrumental support		

Inadequate	30	68.2
Adequate	14	31.8
Informational support		
Inadequate	31	70.5
Adequate	13	29.5
Appraisal support		
Inadequate	26	59.1
Adequate	18	40.9
Improvement in nutritional status		
Not improved	11	25
Improved	33	75

Table 2. Relationship between family support and improved nutritional status in TB patients (n=44)

Variables	Not improved (n, %)	Improved (n, %)	p-value
Emotional support			
Inadequate	2 (6.7)	28 (93.3)	0.001
Adequate	9 (64.3)	5 (35.7)	
Instrumental support			
Inadequate	3 (10.0)	27 (90.0)	0.001
Adequate	8 (57.1)	6 (42.9)	
Informational support			0.001
Inadequate	2 (6.5)	29 (93.5)	
Adequate	9 (69.2)	4 (30.8)	
Appraisal support			0.001
Inadequate	1 (3.8)	25 (96.2)	
Adequate	10 (55.6)	8 (44.4)	
Overall family support			0.013
Inadequate	7 (63.6)	6 (36.4)	
Adequate	4 (18.2)	27 (81.8)	

** Statistical significance based on Chi-square test*

A notable finding was the inverse pattern observed in the emotional support dimension, wherein patients who reported lower emotional support exhibited greater nutritional improvement. This contradicts typical expectations and warrants a deeper examination. One possible explanation relates to the cultural and contextual factors in Acehnese communities, where emotional expression may be more restrained and support may be demonstrated indirectly through actions rather than verbal affirmation. Therefore, patients may perceive emotional support as low, even when other forms of support, such as instrumental or informational support, are strong and more influential in improving nutritional outcomes.

Another contributing factor may be the response bias. In some cultural settings, emotional support is interpreted narrowly (e.g., verbal reassurance), while families focus more on practical assistance, such as providing food, supervising medication intake, and accompanying patients to clinics. As a result, patients may underreport emotional support despite receiving substantial instrumental support, which directly affects nutritional improvement (Acoba, 2024; Al Rahmad & Annisa, 2025). These findings align with those of Neumann et al. (2025) and Xu et al. (2022), who reported that emotional support does not always correlate positively with health outcomes, particularly when other support types are more impactful.

Instrumental support was strongly associated with improved nutritional status, emphasizing the importance of tangible assistance, such as providing nutrient-rich foods, ensuring treatment continuity, and helping with daily activities. Informational support also played a vital role; patients who received accurate nutrition and treatment information from family members demonstrated better nutritional outcomes. In culturally cohesive communities, such information is frequently reinforced through collective decision-making, amplifying its behavioral impact (Ingham et al., 2023). This is consistent with the findings of Li et al. (2025), who reported that family knowledge enhances clinical monitoring and dietary management.

Appraisal support was also significantly associated with nutritional improvements. In collectivist societies such as Indonesia, positive reinforcement and acknowledgment from family members play a motivational role in influencing

adherence to dietary and treatment recommendations. This aligns with the findings of Tavakoli et al. (2022), who found that family engagement enhances patient participation and self-management.

Overall, these findings suggest that family support in TB care is multifaceted and culturally embedded. Emotional expression may not be the primary driver of recovery in certain cultural groups, whereas instrumental, informational, and appraisal support may have a greater influence. Future research should explore how cultural norms shape perceptions of and the effectiveness of different forms of family support in TB management.

Strengthening family capacity, particularly in providing practical assistance and accurate information, may substantially improve nutritional recovery and treatment outcomes.

Conclusion

There was a significant relationship between family support and improved nutritional status among patients with tuberculosis. All dimensions of family support emotional, instrumental, informational, and appraisal contributed meaningfully to improving nutritional status. Patients receiving adequate family support are more likely to experience nutritional improvements during therapy. Family involvement in TB care is essential and should be incorporated into a holistic approach to controlling TB. Future studies should use longitudinal designs to objectively assess changes in nutritional status over time and include anthropometric and biochemical indicators to strengthen the evidence base. Socioeconomic factors should also be considered as control variables in this study.

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