

## Supportive Educative System *Intervention* Based On The Integration Of *Self Care* And *Family Centered Nursing Model* On Family Support In Improving The Nutritional Status Of Tuberculosis Patients

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### Abstract

Malnutrition and tuberculosis (TB) are interconnected or interconnected problems. Malnutrition in TB patients is one of them influenced by lack of family support for TB patients, both in emotional, appreciative, instrumental, and informational support. The purpose of this study is to evaluate the influence of *supportive educational system* interventions in improving family support. This research method is quantitative with a *quasi experimental design*, in two health centers, namely Kandang Mas and Betungan, consisting of 48 respondents who were divided into 2 groups, namely the control group, given the standard intervention of the health center (n=24) and the treatment group, given the standard intervention of the health center *and the supportive educative system* (n=24). The data were analyzed using *the two-way anova* test. The results showed that the family development stage and the interaction between the family development stage and the intervention group did not affect family support ( $p > 0.05$ ). Meanwhile, the *supportive educative system* intervention had a negative effect on family support in improving the nutritional status of TB patients ( $p = 0.015$ , mean = 76.52), however, the *supportive educative system* intervention had a positive effect on instrumental support in the treatment group ( $p = 0.029$ , mean = 81.19). Conclusion of this study is that the *supportive educative system intervention* is not more effective than the standard intervention of the health center, this can occur due to the influence of sample characteristics, research time, and control of variables and other factors that also affect the results of the study.

### INTRODUCTION

Tuberculosis (TB) remains a communicable disease that continues to pose a serious challenge to global health systems, including in Indonesia. According to the Global Tuberculosis Report 2023 published by the WHO, Indonesia ranks second worldwide in TB burden, after India. TB presents not only clinical issues but also complex social, economic, and psychological dimensions. It is strongly associated with low socioeconomic status, high population density, limited access to healthcare, and chronic malnutrition. The relationship between TB and malnutrition is bidirectional. Malnutrition weakens the immune system, increasing vulnerability to TB infection. Conversely, TB infection worsens patients' nutritional status due to increased energy requirements,

reduced appetite, and metabolic disruptions. Kartini (2023). indicated that TB patients with poor nutritional status are at higher risk of complications and delayed recovery. Thus, nutritional recovery is a critical component in comprehensive TB control strategies.

Beyond medical aspects, family support plays a crucial role in the treatment of TB. Recent studies affirm that treatment success depends not only on adherence to medication but also on social support, particularly from family (Du et al., 2021; Zaqi et al., 2023). This support includes emotional, informational, and instrumental forms such as providing nutritious food and medication reminders. However, not all TB patients receive adequate family support. The prevailing stigma associated with TB remains a major barrier. Research by Chen et al. (2021) reveals that

stigma can lead to social exclusion and rejection within families, negatively impacting patient motivation and treatment adherence. A lack of openness about the illness further complicates disease management and nutritional recovery.

To address these challenges, intervention approaches that actively involve families as partners in patient recovery are highly relevant. The Family Centered Nursing model offers a holistic approach by positioning the family at the center of care, supported by nurses as educational and emotional facilitators. This model aligns with Orem's Self-Care Theory, which emphasizes the empowerment of individuals and families to meet their own health needs independently. The integration of these two approaches results in a supportive educative system intervention that includes structured family education, guidance, and assistance. Recent studies have shown that such interventions enhance family involvement, improve medication adherence, and elevate patients' quality of life (Ningrum et al., 2025; Rakhshani et al., 2022).

Nonetheless, most prior research has focused primarily on medication adherence, with limited investigation into how such interventions affect the nutritional status of TB patients. Given that successful therapy is significantly influenced by adequate nutritional intake, it is essential to further explore the role of supportive educative interventions in promoting nutritional outcomes through enhanced family support. This study aims to evaluate the effectiveness of a supportive educative system intervention—integrating Self-Care Theory and the Family Centered Nursing model—in enhancing family support for improving the nutritional status of TB patients.

## METHOD

This study employed a quantitative approach with a quasi-experimental design involving a control and intervention group. The target population consisted of families of tuberculosis (TB) patients registered at the Betungan and Kandang Mas Health Centers in Bengkulu City. Participants were selected using simple random sampling. Based on the sample size calculation, a total of 48 participants were included in the study, divided equally into the intervention group ( $n = 24$ ) and the control group ( $n = 24$ ). The intervention was administered four times over a four-week period, with one session per week. Each session included structured health education, motivational communication, and strategies to enhance family

involvement in supporting TB patients' nutritional status.

Data were analyzed using the two-way ANOVA test to examine the effects of the intervention and other interacting variables. A positive effect in this study refers to an increase in the family support score following the intervention, indicating enhanced involvement or assistance by the family. Conversely, a negative effect refers to a decrease in the family support score, suggesting a decline in perceived or actual support following the intervention. The research was conducted in the working areas of the Betungan and Kandang Mas Health Centers in Bengkulu City. The study began with proposal preparation and preliminary field assessments in March 2025, followed by the data collection phase conducted from March to April 2025.

## RESULTS AND DISCUSSION

### Results

**Table 1. The Effect of Supportive *Educative System Interventions* on Family Support**

	Mean	p-value
Family Support Improving Nutritional Status		
Control	82.75	0.015
Treatment	76.52	
Family Instrumental Support		
Control	76.16	0.029
Treatment	81.19	
Stages of family development	79.64	0.793

Source: Research Results, 2025

As shown in Table 1, the stage of family development and its interaction with the intervention group did not have a statistically significant effect on family support ( $p = 0.793$ ). Conversely, the supportive educative system intervention was found to significantly reduce the overall family support score in the intervention group compared to the control group ( $p = 0.015$ ; mean = 76.52 vs. 82.75). However, further analysis revealed that the intervention had a positive impact on the instrumental support dimension within the treatment group ( $p = 0.029$ ; mean = 81.19).

## DISCUSSION

Statistical evidence suggesting that supportive educational system interventions can negatively impact overall family support in tuberculosis (TB) patients

needs to be understood in context. Lestari et al. emphasize that strong family support is essential for TB patients because it correlates with adherence to medication and emotional well-being (Lestari et al., 2021). Instead, studies show that the stigma attached to TB can create distance between patients and their families, reducing much-needed emotional support. Xu et al. highlight that stigma can lead to social isolation and reduced family support, as family members stay away due to fear of transmission, which ultimately negatively impacts patients' treatment outcomes (Xu et al., 2021). Such interventions can inadvertently increase anxiety in the family, creating tension between the patient and his or her support system. This is supported by the findings of Nirmal et al., which suggest that negative family dynamics, including neglect and stigma, can reduce the effectiveness of treatment support in TB patients (Nirmal et al., 2021). The relationship between TB education and family dynamics suggests that although interventions aim to improve support, they can exacerbate existing family challenges, negatively impacting family support participation during treatment.

The impact of supportive educational system interventions showed striking differences when comparing their effects on instrumental support and overall family support. Instrumental support, which includes tangible help such as medication reminders or transportation to a healthcare facility, has been shown to increase through structured interventions such as health education (Mariani et al., 2022). Mariani et al. support this by showing that family training can improve medication adherence through the use of family members as treatment supervisors (Mariani et al., 2022). However, in terms of overall family support, findings from Alinaitwe et al. suggest that TB-related stigma and fear often mask the positive aspects of family involvement, thus negatively impacting the emotional and psychological support that is important for patient engagement and motivation (Alinaitwe et al., 2025).

Therefore, while instrumental support can be improved through intervention, by providing concrete guidance to families on how to help patients (Belarminus et al., 2023), family support in general can actually decrease due to increased stigma and tension in family dynamics around TB treatment (Nagarajan et al., 2023). This dichotomy shows the need for a more layered approach in the implementation of the education system, so that practical help and emotional

connectivity in the family can be strengthened simultaneously.

Studies conducted within the framework of supportive educational system interventions in TB patients showed significant differences in family support scores between treatment and control groups. Melizza et al. indicated that family support was significantly higher in the control group than in the intervention group, suggesting that traditional support mechanisms may be more aligned with patient needs than structured interventions (Melizza et al., 2022). Although specific mean values were not detailed, the results showed a striking gap that favored the control group, confirming the strong role of family support in health-related situations.

The stages of family development were found to have no significant effect on the level of family support in this study. These findings are in line with a report from Alinaitwe et al., which suggests that diverse family dynamics, rather than fixed developmental stages, play a more important role in determining the quality and level of support provided to TB patients (Alinaitwe et al., 2025). When family members face a health crisis, direct attention to care is more urgent than more abstract developmental factors, thus reducing the predictive power of developmental stages on support outcomes.

In addition, family structures often show adaptability based on patient support needs, rather than following a rigid developmental model. The findings from Nirmal et al. also corroborate that the level of family support is more influenced by contextual factors such as stigma and perceived burden on the patient than by the stages of family development (Nirmal et al., 2021). The study suggests that traditional measures of family development may be less able to capture the dynamics of relationships and resources in complex health challenges such as TB.

## CONCLUSION

Statistically, the family development stage as well as the interaction between the family development stage and the intervention group did not affect family support. Meanwhile, the *supportive educative system* intervention in the intervention group had a negative effect on family support in improving the nutritional status of TB patients, but nevertheless the *supportive educative system* intervention had a positive effect on instrumental support in the treatment group.

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