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Original article

A supportive-educative intervention for tuberculosis patients: Integrated self-care and family-centered nursing

Nur Melizza [1], Rachmat Hargono [2], Makhfudli [2]

[1] Muhammadiyah University, Malang, Indonesia
[2] Airlangga University, Surabaya, Indonesia

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Abstract: *Aim* — This study aims to evaluate the effect of supportive educative system intervention on Tuberculosis (TB) patient's family support.
Material and Methods — This study was a quantitative study with a quasi-experimental design, conducted in the Public Health Center (PHC) of Kedungkandang and Ciptomulyo with 48 respondents. The respondents were divided into the control group with standard PHC intervention (n=24) and the treatment group with standard PHC intervention added with the supportive educative system (n=24). The data were analyzed by paired t-test and independent t-test.
Results — There was a significant difference in family support between treatment and control. The results indicated that a supportive educative system significantly increases family support (p=0.003). Interestingly, PHC standard intervention showed improvement in family support (68.46±73.58) than supportive educative system (74.29±75.83). Supportive educative system interventions were less effective than standard PHC interventions. It could be influenced by sample characteristics, time of the study, control of variables, and other factors.
Conclusion — Supportive educative interventions are effective in improving family support but are no better than standard PHC interventions.

Keywords: Family support, intervention, public health center, supportive educative system, tuberculosis.

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Correspondence to Nur Melizza. Address: Department of Nursing, Faculty of Nursing Science Community, Muhammadiyah University of Malang, Bendungan Sutami Street, Malang, East Java 65145, Indonesia. Phone: +62 341 551149. E-mail: melizza@umm.ac.id.

Introduction

Tuberculosis (TB) is one of the dominant diseases in Indonesia. According to WHO, Indonesia is placed second in the number of reported TB cases [1]. Indonesian Health Ministry survey showed that TB prevalence in 2013-2014 was 660 per 100.000 population and 1.600.000 people were estimated to have TB in Indonesia [2, 3]. West Java, East Java, and Central Java have the highest TB cases in Indonesia. More specifically in East Java, Surabaya (4.754), Jember (3.128), Sidoarjo (2.292), and Malang (1.932) were the first and fourth regions with the highest number of TB patients [4]. Additionally, based on the Malang City Health Profile report in 2014, Sukun and Kedungkandang Subdistricts were determined as the first and second subdistricts with the highest number of TB patients out of five subdistricts in Malang City, with a total of 84 smear-positive TB patients in Kedungkandang and 101 in Sukun.

Tuberculosis is associated with poverty, population density, alcoholism, stress, drug addiction, and malnutrition. Malnutrition in tuberculosis patients is influenced by several factors, such as 1) economic factors, 2) comorbidities, 4) knowledge, 5) patient behavior on food and health, 6) long-suffering from pulmonary TB, 7) age, 8) sex, 9) marital status, 10) education level, 11) confidence in foods and 12) family support [5-9].

Based on the data from the Public Health Center (PHC) of Kedungkandang and Ciptomulyo in the third quarter of 2017, it was observed that the number of suspected TB patients in both areas was quite high, accounting for 132 cases in Kedungkandang and 220 in Ciptomulyo. One of the main contributors is the number of TB relapse cases. The number of TB patients with positive acid-resistant bacteria in Kedungkandang was 29 people, with 62% experienced decreasing nutritional status, and the increase of TB relapse was 2.03%. In the previous year, there was only 1 person who experienced TB relapse but the number is increased to 7 people this year. Meanwhile, the number of TB patients with positive acid-resistant bacteria in Ciptomulyo was 28 people, with 50% experienced a nutritional status decrease, and the incidence of TB relapse has increased to 3.3%. This happens because of the lack of family support in improving the nutritional status of TB patients.

TB Program holder in the PHC said many programs have been done, such as TB counseling, collaborating with health cadres to make a suspect discovery, and the distribution of 6 cans/person to overcome nutrition problems. However, the program has not run optimally due to the lack of active participation from patients and mainly due to the lack of support from family members.

Patients and families are usually focused more on the treatment but the other supporting factors are unnoticed, such as family support. This study is focused to evaluate the supportive educative system intervention, which consists of teaching, guidance, and support, to TB patients' families in increasing family support.

Material and Methods

Ethical consideration

This study was approved by the University Ethics Committee (February 2018), ethical number: 643-KEPK. All of the respondents had agreed with the given informed consent.

Study design

This study is quantitative research with a quasi-experimental design. This study took place in two PHCs in Kedungkandang and Ciptomulyo, Malang City. As many as 48 respondents were divided into 2 groups, control (n=24) in Kedungkandang PHC and treatment (n=24) in Ciptomulyo. The sampling technique was simple random sampling with several inclusion criteria, (1) the family member of the TB patient is in a healthy condition; (2) the TB patient has decreased nutritional status (IMT<18,5 KgM^2), and (3) the nuclear, patrilocal or patrilineal family structure from the patient. While the exclusion criteria are family of TB patients with comorbidities, such as diabetes mellitus, HIV/AIDS, and other comorbidities that could affect the patient's nutrition condition.

Table 1. Respondents' characteristics in both groups

Respondents' characteristics	*Control group*		*Treatment group*	
	Total		Total	
	n (24)	%	n (24)	%
Gender				
Female	17	70.8	21	87.5
Male	7	29.2	3	12.5
Age				
≦45 years	15	62.5	9	37.5
> 45 years	9	37.5	15	62.5
Stage of family development				
Stage: children reaching adolescence	10	41.7	3	12.5
Stage: children reaching adulthood	14	58.3	21	87.5
Social culture				
Abstinence from eating	19	79.2	17	70.8
Do not abstain from eating	5	20.8	7	29.2
Economic level				
Economically not capable	7	29.2	9	37.5
Economically capable	17	70.8	15	62.5
Knowledge level				
Poor	11	45.8	12	50
Enough	8	33.3	5	20.8
Good	5	20.8	7	20.8

Table 2. Comparison between control and treatment group pre and post-interview

Group		*Mean ± S.D*	*Paired t-test (p-value)*
Control (n=24)	Pre	68.46±12.7	0
	Post	73.58±14.4	
Treatment (n=24)	Pre	74.29±8.6	0,003
	Post	75.83±8.4	

*Independent t test p-value =0.005.

Data collection

Both groups were given an initial intervention, which was the PHC health programs for TB patients. The program consists of health counseling, inspection schedule, drug administration, and providing milk. Furthermore, the treatment group was given the supportive educative system, which consists of teaching, guidance, and support related to the nutrition of TB, besides the initial intervention, while the control group was not given any additional intervention. The supportive educative system consists of 3 sessions and divided into 3 meetings for 2-3 weeks, and lasted for 45-60 minutes in every meeting. The independent variable in this study was the supportive educative system intervention, while the dependent variable was the family support in improving the nutritional status of TB patients.

At the beginning of the program, the participants were given a pretest, the PHC standard intervention, and the time contract for the next meeting. At the second meeting, the participants were given a supportive educative system, which consists of guidance through introduction, explanation, information about the recommended food for TB patients, and providing positive reinforcement as a form of support. In addition, the participants also got a booklet as reading material at home. In the second week or third meeting, it was a revisit and posttest to evaluate the effect of the intervention by filling out the questionnaire. Meanwhile, the control group's interventions were carried out according to the PHC standard in the form of TB-related education, milk distribution, and scheduling for drug administration and screening. The posttest was done after 2 weeks of intervention.

Data analysis

The collected data were analyzed using SPSS software, version 16.0 (IBM) using the bivariate analysis, the paired t-test, and the independent t-test.

Results

The respondents in the control group were dominated by female respondents (17 or 70.8%) and belong to > 45-years age group (15 or 62.6%). They were in a family with adolescent children (14 families or 58.3%), had a food abstinence culture (19 families or 79.2%), and at a good economic level (17 or 70.8%). The level of family knowledge about TB and TB nutrition was mostly in the "less" category (11 or 45.8%). The respondents in the treatment group were mostly female (21 or 87.5%) and belong to > 45-years age (15 or 62.6%). Most of the respondents had children who were reaching adulthood (14 or 58.3%) and adopting an eating abstinence culture (17 or 70.8%), and the economic level of respondents was capable (15 or 62.5%). Similar to the control, most of the respondents in this group had TB knowledge in the "less" category (12 or 50.0%) (*Table* 1).

Based on the paired t-test result, there was a difference before and after intervention in both groups ($p < 0.05$). The independent t-test results showed a significant difference between the control and treatment ($p<0.05$). The mean value in the treatment group showed a 1-point increase, while the control group had 5-point increase, which means the intervention of supportive educative system influence the family support, but the influence is not as high as the control (*Table* 2).

Discussion

These findings implied that supportive educative system interventions affected increasing the family support in the treatment group. Interestingly, there was a significant difference between the control and treatment groups. The difference indicated that the control group had higher effects on family support than the treatment.

Interventions in the control group were more influential on family support. This finding is following Notoatmodjo in Yuniar, which explains that scheduling the patient's drug administration could improve the drug control and reduce the risk of resistance [10]. Another study by Winetsky et al. also explained that reduced access to supplemental nutrients is one of the factors that influenced the incidence of TB [11]. The provision of information also helps in improving the knowledge and understanding of the patient, which is a pivotal component of self-care [12].

However, this study was not following Mohammadpour et al., who explained that supportive educative interventions can improve the non-hospitalized patient's self-care abilities and positively influence the public health outcomes [12]. Other studies also explain that Orem's Self-Care Model in form of a supportive nursing system can improve the quality of life in all dimensions, including physical function, physical role restriction, body pain, general health, vitality, social function, emotion limitation, and mental health ($p<0.05$). Furthermore, Orem's nursing care model improved the overall function and quality of life and reduced the cost of migraine and migraine-related disability in individuals and communities [13].

M'imunya in his study also explained that counseling by a nurse over the phone increases the proportion of children completing treatment from 65% to 94% and counseling through home visits further increases it to 95%. Both interventions are superior to counseling by doctors at the tuberculosis clinic. M'imunya also explained that educational or counseling interventions can improve the successful completion of treatment but the number of benefits may vary depending on the nature and the arrangement of the intervention [14].

The results obtained in this study may be caused by the fact that most of the respondents in the intervention group had a lack of knowledge. With sufficient knowledge about nutritious food, the type and amount of food will also be considered by the patients [12]. In addition, the abstinence-eating culture can also influence the support of intervention groups. For instance, a patient knows that the food is not good for consumption culturally but it must be consumed then that patient will ignore the knowledge and vice versa. A person's culture is not easy and takes a long time to change [5, 15].

The concept of nursing by Orem emphasizes the individual's ability to meet his own care needs without depending on others. Most respondents in the treatment group were dominated by the elderly (aged > 45 years). In that condition, instrumental support, such as delivering treatment to patients, providing financial assistance, and information, such as the nutrition care of TB patients, are less provided to the respondents [11]. In addition, Orem's conceptual model is more direct and the patients are included in the systems they are capable for physical movement, so the independence in other than physical movements is less influential.

According to Winetsky et al., the intervention according to Orem's theory is also done to reflect the individual influence on the environment [11]. The environmental control in this study is rarely done. For instance, the housing conditions that could influence the instrumental support, such as the distance of the patient's house to the shopping center could hinder the respondents to buy the recommended food. Furthermore, some environmental conditions also hinder access to information, such as no television and the difficulty to reach a working signal service. The condition and atmosphere of the respondent's home while performing the system were also less controlled because the arrival of other family members could influence the intervention as well.

Conclusion

This study concluded that the supportive educative interventions are effective in improving family support but worse than the PHC standard interventions.

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Conflict of Interest

The authors declare no conflicts of interest in this study.

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Authors:
Nur Melizza – Lecturer, Department of Nursing, Faculty of Nursing Science Community, Muhammadiyah University, Malang, Indonesia. https://orcid.org/0000-0001-5533-2561.
Rachmat Hargono – Lecturer, Department of Health Promotion and Behavioral Science, Faculty of Public Health, Airlangga University, Surabaya, Indonesia. https://orcid.org/0000-0003-1058-7821.
Makhfudli – Lecturer, Department of Community Nursing, Faculty of Nursing, Airlangga University, Surabaya, Indonesia. https://orcid.org/0000-0002-0181-6402.