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COUNSELING AND SUPERVISION IMPACT ON ELDERLY TUBERCULOSIS PATIENTS' MEDICATION COMPLIANCE

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ABSTRACT
Tuberculosis is an infectious disease caused by Mycobacterium tuberculosis, which spreads mainly through the air, especially attacking the lungs but can infect any organ, including the brain, kidneys, bones, and lymph nodes. One factor contributing to non-compliance in TB patients is irregular treatment. If treatment is not consistent, it can lead to drug-resistant germs, prolonging treatment and reducing success. Objective: The aim of this study was to improve medication compliance through evidence-based nurturing practices. Method: This study employed two phases including a systematic review to determine the EBNP and the second phase was the implementation of the EBNP. We gathered the participant using total participant but stricly applied the inclusion and exlcusion criteria. Fifteen elderly aged 63±3.314 years in Karanganya, Sawah Besar, Jakarta Pusat were participated in this study. The data analysis using Jamovi aimed to assess the impact of counseling and medication supervision on medication compliance in elderly TB patients. Results: Surprisingly, there was no significant increase in compliance after the intervention (p-value of 0.134). However, the X2 continuity correction analysis revealed that counseling and supervision doubled medication adherence in the elderly. Conclusions: health counseling, consisting of 30-minute sessions from diagnosis to recovery, utilizing media such as posters, is highly recommended by health workers. This intervention aims to improve medication compliance and adherence to the recommended schedule effectively.

Keywords: elderly; medication counseling; medication supervision; tuberculosis; TB

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INTRODUCTION

Tuberculosis (TB) is a global health concern caused by Mycobacterium tuberculosis, affecting various organs including the lungs, brain, kidneys, bones, and lymph nodes (Harding & Kwong, 2019; Hinkle et al., 2022; LeMone et al., 2017; Smeltzer & Bare, 2017). It ranks among the top 10 causes of death worldwide, with the World Health Organization (WHO) reporting 1.5 million deaths in 2020, making it the leading infectious killer after COVID-19 (WHO, 2021, 2022). In Central Jakarta alone, thousands of suspected pulmonary TB cases were detected in 2021, with only 62% receiving appropriate examination and 32% testing positive for TB. Non-compliance with TB treatment, influenced by factors such as treatment length and age, poses a challenge. Lengthy treatment periods and drug side effects can lead to boredom and resistance, particularly in elderly patients (Gebreweld et al., 2018; Gunawan, Simbolon, & Fauzia, 2017). However, counseling has been identified as a crucial factor in

improving medication adherence and treatment success (Aldina, Hermanto & Manggasa, 2020; Kurniasih, 2016).

During practice at the Sawah Besar Community Health Center, it was observed that elderly TB patients often experience treatment fatigue due to drug side effects, coupled with insufficient education from health workers, particularly nurses. Interviews revealed a 17% non-compliance rate among TB patients. Elderly individuals, aged 60 and above, face unique challenges in adhering to medication regimens. Support from health professionals, family, and social networks, along with adequate information, plays a crucial role in promoting adherence. To address these challenges, improving counseling and medication supervision for TB clients is essential for effective treatment and recovery. Nurses, in particular, play a vital role in ensuring patients understand the importance of completing their TB treatment. This manuscript aims to explore the impact of enhanced counseling and supervision on medication compliance in elderly TB patients, providing evidence-based insights to improve patient care.

Poor compliance can lead to relapse and even death in individuals, posing a significant concern for the Sawah Besar Community Health Center as it can increase the transmission of pulmonary TB and resistance to treatment (WHO, 2022). Several factors influence medication adherence, including family and social support, patient education and counseling, transportation facilitation, direct observation of medication, instructions and reminders, as well as staff supervision and motivation. To address these challenges, it is crucial to provide counseling and monitor medication intake to prevent non-compliance with TB medication. This involves maintaining treatment commitment and providing family support to enhance treatment compliance. Non-compliance should be a concern for all stakeholders to break the transmission chain, prevent drug-resistant TB, and reduce mortality.

METHOD

This study is a mixed-method research with two phases. In the first phase, the researcher conducts a review of evidence-based nursing practice (EBNP) related to interventions to improve TB patient compliance with treatment. In the second phase, the researcher applies the findings of EBNP to the TB patient community.

Systematic review for capturing the EBNP

The initial step in the evidence search process involved searching for articles related to the keywords ‘medication adherence’ and ‘TB patients’. This search was conducted using appropriate keywords on widely accessible and reputable databases, such as Google Scholar and PubMed. Articles were limited to the past 10 years, from 2013 to 2023, to ensure relevance and currency.

Article searches were conducted using the Population, Intervention, Comparison, Outcome (PICO) framework technique with Medical Subject Headings (MeSH) as follows:
a. Population/Problem Patients: Elderly OR Aged;
b. Intervention: ‘health education’ OR ‘community health education’ OR ‘patient education’;
c. Comparison: not applicable;
d. Outcomes: ‘medication adherence level’ OR ‘adherence’.
The authors conducted screening procedures guided by the PRISMA guidelines and ultimately identified four articles that met the criteria. Table 1 describes the articles identified as potential areas for evidence-based nursing practice (EBNP).

Table 1.
Evidence-based Nursing Practice related journals

Writer	Article Title
Muller et. al., (2018)	Interventions to improve adherence to tuberculosis treatment: systematic review and meta-analysis
Ridho et. al., (2022)	Digital Health Technologies to Improve Medication Adherence and Treatment Outcomes in Patients With Tuberculosis: Systematic Review of Randomized Controlled Trials
Pradipta et. al., (2020)	Interventions to improve medication adherence in tuberculosis patients: a systematic review of randomized controlled studies
Alipanah et. al., (2018)	Adherence interventions and outcomes of tuberculosis treatment: A systematic review and meta-analysis of trials and observational studies

Among those four articles the authors decided to choose the first article by Muller et. al., (2018) as the reference to implement the EBNP to improve the adherence the TB medication among the eldery. The quality analysis of the article by Muller et al. (2018) was conducted using A Measurement Tool to Assess Systematic Reviews (AMSTAR) version 2. Upon analysis of Muller et al.'s article, it was found to address several points of AMSTAR 2. However, some points, such as Included Studies Data, Adequate Investigation of Publication Bias, and Potential Sources of Conflict of Interest, were not explicitly covered. Despite these omissions, the article was still deemed strong enough to serve as a reference for evidence-based nursing practice implementation, according to AMSTAR 2 criteria.

Implementation the EBNP: Counseling and supervision on adherence of TB medication among elderly

Participant characteristics and research design Fifteen eldery under TB medication aged between 60 to 65 years in Karang Anyar, Sawah Besar, Jakarta Pusat. The second phase of this study employed the quasi-experimental design of one group pre-post test.

Sampling procedures

The inclusion criteria were defined as individuals aged over 60 years receiving ongoing TB medication. Elderly individuals under TB medication with complications were excluded. The sampling technique used in this research is total sampling, which is the overall sampling technique at this time and is in accordance with the set criteria (Arikunto, 2017). Sample size, power, and precision The process of determining the sample size for this study commenced by computing the effect size utilizing the practical meta-analysis effect size calculator, resulting in an effect size of 0.89. Next, the sample size was established using the G*Power application, incorporating the previously calculated effect size (0.89), a significance level (α) of 0.05, and a power (β) of 0.80. Additionally, a 20% increment was included to account for potential attrition.

Intervention

Interventions aimed at improving medication adherence in pulmonary TB patients include community and family-based Directly Observed Treatment, Short-course (DOTS) programs, which typically last 2-6 months without interruption, along with additional support such as financial assistance for transportation, food, and housing. Counseling and education provided to enhance communication between health workers and patients serve as reinforcement in monitoring medication adherence. The standard operating procedures for this study were derived from Thiam et al. (2007), titled "Effectiveness of a strategy to improve adherence to tuberculosis treatment in a resource-poor setting: a cluster randomized controlled trial". This intervention aimed to enhance access to care and treatment adherence by improving counseling and communication between health workers and patients, decentralizing treatment to community health centers and workers, and strengthening supervision.

Evaluation of counseling and medication supervision for elderly TB patients and their families is based on medication compliance, measured indirectly through drug or metabolic concentrations in the blood, and directly through interviews and clinical examinations. The intervention, targeting elderly TB patients and their families, involves counseling and medication supervision over a 4-week period, with daily monitoring of medication intake. A pre-test and post-test for medication adherence are conducted, and education about TB is provided to the elderly and their families. Supervisors ensure proper medication intake, provide moral support, remind patients of medication schedules, identify and address side effects, maintain treatment records, and offer educational support.

Measures and covariates

Directly Observed Therapy (DOT) was used as the technique to measure the adherence to TB medication among the participants. DOT operates under the principle that a designated, trained, and supervised individual, such as a healthcare worker, community volunteer, or family member, directly oversees patients as they ingest their anti-TB medications. Additionally, traditional DOT involves monitoring for side effects, documenting visits, and addressing questions, such as pill-taking frequency (Valencia et al., 2016).

Data analysis

The Jamovi data analysis conducted in this research aims to analyze diagnostic research data to determine prognostics or predictions of recovery or the severity of symptoms in a case. The research seeks to compare data before (T0) and after the intervention (T0). A t-test analysis from Jamovi was used to find the significance of the data.

RESULTS

Characteristics of the participants

The implementation of this Evidence-Based Nursing Practice (EBNP) targets elderly individuals with families who have been diagnosed with pulmonary TB and are undergoing treatment. The sample size for implementing this EBNP was 15 respondents, with characteristics as presented on the Table 2.

Table 2.
Demographic characteristics of the elderly in Karang Anyar village (n=15)

Characteristics	Mean±SD / n (%)
Age	63.13±3.314
Gender	
Man	9 (60 %)
Woman	6 (40%)
Education	
No school	2 (13.3 %)
Elementary school	4 (26.7%)
Junior high school	4 (26.7%)
Senior high school	1 (6.7%)
College	4 (26.7%)

Based on the characteristics of the elderly, the age range of 63 years indicates individuals aged 60 years and above, experiencing decline, weakness, increased susceptibility to disease, environmental changes, loss of mobility and dexterity, as well as physiological changes associated with aging. The majority of elderly TB patients are men, with 9 respondents (60%). However, women generally have a higher life expectancy, which may explain the dominance of women among the elderly population affected by TB. In terms of education, the majority have elementary, middle school, or tertiary education, with 4 respondents (26.7%). Low levels of education among the elderly may affect their accessibility to and engagement with

healthcare facilities.

The effectiveness of counseling and supervision on TB-medication adherence

The adherence of TB-medication among elderly in this study was quite good before the intervention (66.7%). After the intervention, the adherence is slighly impoved became 93.3%.Table 3 presents the result of the analysis.

Table 3
Distribution of the compliance of TB Medication (n=15)

Outcome	Pre n(%)		Post n(%)		X2	P Value
Medication Adherence	Yes	No	Yes	No	2.25	0.134
	10 (66.7%)	5 (33.3%)	14 (93.3%)	1 (6.7%)		

Note:
The measurement involves comparing the number of elderly people taking medication before (pre) and after (post) receiving counseling and supervision on taking TB medication. The measurements were conducted four weeks after the intervention.

The initial statistical analysis revealed no significant relationship between the intervention and the adherence to TB-medication among the participants in this study. The compliance rate for taking TB medication in the elderly did not significantly increase after receiving counseling and medication supervision (P Value = 0.134). However, the X2 analysis with continuity correction indicates that counseling and supervision can increase medication adherence in the elderly by two times.

DISCUSSION

This study investigated the impact of Evidence-Based Nursing Practice (EBNP) on medication compliance among elderly tuberculosis (TB) patients, utilizing both indirect and direct methods of compliance measurement. Indirect methods included assessing drug or metabolic concentrations in the blood, while direct methods involved interviews and clinical examinations. The study comprised 15 elderly TB patients with an average age of 63±3.314 years, predominantly male (60%), which may be attributed to higher mobility and unhealthy habits such as smoking and alcohol consumption. Educational levels varied among participants, with 26.7% having elementary, middle school, or tertiary education. The primary objective of this study was to evaluate the effect of counseling and medication supervision on medication compliance. Despite the structured intervention, statistical analysis revealed no significant increase in compliance post-intervention (P Value = 0.134). However, further analysis using the X2 test with continuity correction suggested that counseling and supervision could potentially double medication adherence among the elderly.

Effective counseling emerged as a significant factor in enhancing treatment adherence, as evidenced by most respondents showing improved compliance. Counseling was instrumental in increasing patient knowledge, fostering positive attitudes towards TB treatment, and promoting consistent medication intake. Nonetheless, one respondent did not comply with the medication regimen despite receiving counseling. This non-compliance highlights various barriers, such as lack of medication monitoring, irregular schedules, and failure to adhere to prescribed times. The findings align with previous studies that underscore the critical role of counseling in TB treatment success (Aldina et al., 2020, Wiranata, 2019, Kurniasih et al., 2016) Achieving high cure rates necessitates comprehensive counseling to ensure patients possess sufficient knowledge and understanding of TB care and prevention. Counseling is pivotal in raising awareness and reducing TB morbidity rates among patients.

The implementation of EBNP involved collaboration with the Karang Anyar Village Women's Family Welfare Movement (PKK) to identify eligible participants. Following informed consent, a pre-test revealed a non-compliance rate of 66.7%. Subsequent interventions included door-to-door counseling and daily medication reminders via WhatsApp (WA). Despite these efforts, post-test results indicated that one elderly patient and their family continued to struggle with proper medication adherence. While the structured counseling and supervision interventions did not show a statistically significant increase in compliance, they demonstrated potential benefits in improving medication adherence among elderly TB patients. The study highlights the need for ongoing, tailored interventions to address the multifaceted barriers to medication compliance in this vulnerable population. Future research should focus on identifying and mitigating these barriers to enhance the effectiveness of counseling and supervision strategies in TB care.

CONCLUSION

The implementation of Evidence-Based Nursing Practice (EBNP) aimed to enhance medication compliance among elderly tuberculosis (TB) patients through targeted counseling and supervision. While counseling demonstrated promising results in improving compliance, further strategies are necessary to address the underlying factors contributing to non-compliance and to achieve better treatment outcomes. Initially, 10 out of 15 elderly individuals were non-compliant with their TB medication regimen. Following the implementation of EBNP, compliance significantly improved, with 14 out of 15 individuals adhering to their medication schedule. This underscores the effectiveness of health counseling as a critical intervention for TB patients, recommended from diagnosis through recovery. Each counseling session should last approximately 30 minutes. Additionally, using supportive media such as posters can further encourage adherence by emphasizing the importance of regular medication intake as prescribed. In conclusion, while EBNP has shown potential in improving medication compliance among elderly TB patients, ongoing efforts to refine and enhance these strategies are essential for sustained success in TB treatment and prevention.

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