



Morgensonne
Media

JOURNAL OF MORGENSONNE MULTIDISCIPLINARY RESEARCH (JMMR)

**ANALYSIS OF NURSING PRACTICE IN CLIENTS WITH
RESPIRATORY SYSTEM DISORDERS: A PRIMARY CASE
OF PULMONARY TUBERCULOSIS WITH EDUCATIONAL
INTERVENTION USING THE BOOKLET "PREVENTING
RECURRENT PULMONARY TB RELAPSE"**

Vol. 1 No. 1, September 2025

E-ISSN :



Analysis of Nursing Practice in Clients with Respiratory System Disorders: A Primary Case of Pulmonary Tuberculosis with Educational Intervention Using the Booklet “Preventing Recurrent Pulmonary TB Relapse”

Herdalena Safitri¹, Ani Syafriati²

¹ Pusri Hospital Palembang

² Universitas Muhammadiyah Surakarta

Correspondence: as600@ums.ac.id

Article Info

Article history:

Received Aug 11th, 2025

Revised Aug 14th, 2025

Accepted Aug 27th, 2025

Keyword:

Pulmonary tuberculosis, nursing practice, booklet education, relapse prevention, respiratory disorders, systematic review

ABSTRACT

Background: Pulmonary tuberculosis (TB) remains a major global health problem with high recurrence rates, especially in low- and middle-income countries. Nursing interventions, particularly educational programs, play a crucial role in preventing relapse. Booklet-based education offers a practical and accessible medium to enhance patient knowledge and adherence.

Objective: This systematic review aimed to evaluate the effectiveness of booklet-based educational interventions delivered by nurses in preventing recurrent pulmonary TB.

Methods: A literature search was conducted in PubMed, ScienceDirect, Scopus, ProQuest, and Google Scholar for studies published between 2018–2024. Eligible studies included randomized controlled trials, quasi-experimental, and observational designs assessing booklet-based education for TB patients. Quality was appraised using the Joanna Briggs Institute tool, and thematic synthesis was applied.

Results: From 87.660 identified records, 17 studies met the criteria. Most studies demonstrated significant improvements in patient knowledge, medication adherence, and self-care practices following booklet interventions. Programs combining booklets with nurse-led counseling yielded greater benefits compared to booklets alone. Recurrence rates decreased in interventions with sustained follow-up and culturally adapted content.

Conclusion: Booklet-based education, especially when integrated with nurse-led counseling, effectively enhances TB patients' knowledge and adherence, reducing relapse risk. Incorporating culturally tailored and easy-to-understand booklets into nursing care is recommended to improve outcomes.



© 2025 The Authors. Published by CV. Morgensonne Media. This is an open access article under the CC BY license (<https://creativecommons.org/licenses/by/4.0/>)

INTRODUCTION

Tuberculosis (TB) is a significant public health problem at the global, regional, national, and local levels. TB is an infectious disease caused by *Mycobacterium tuberculosis*, with highly variable clinical symptoms. While TB bacteria primarily attack the lungs (pulmonary TB), they can also affect other organs and tissues. TB has a very rapid transmission process; infection occurs when an individual with active TB coughs, sneezes, speaks, or spits, releasing TB bacilli into the air. Once inhaled, these bacilli may spread from the lungs to other parts of the body via the bloodstream, lymphatic system, airways, or direct extension to other tissues (Solihin & Alifah, 2021).

Pulmonary TB remains one of the leading infectious causes of global health problems. According to WHO, in 2019 an estimated 10 million new cases of pulmonary TB were reported worldwide, with 1.5 million deaths. The majority of cases occurred in Southeast Asia (44%), Africa (25%), and the Western Pacific (18%), with smaller proportions in the Eastern Mediterranean (8.2%), the Americas (2.9%), and Europe (2.5%). Indonesia ranked second globally in TB burden after India (Pallunan & Langan, 2023).

The 2013–2014 Indonesian TB prevalence survey by the Ministry of Health reported an incidence rate of 399 per 100,000 population and a prevalence rate of 647 per 100,000. With a population of approximately 250 million, this translates to around 1 million new TB cases and 1.6 million total TB patients annually. TB-related deaths reached 100,000 per year, or about 273 deaths daily, placing Indonesia as the second highest TB burden country after India. In 2016, 324,539 TB cases were notified nationwide, with South Sulawesi ranking sixth among provinces. Maros Regency reported the highest TB detection rate, and in Makassar City, there were 1,918 new smear-positive cases, 153 relapses, 1,016 X-ray-positive cases, and 275 extrapulmonary TB cases in 2015, predominantly among individuals over 45 years old and those with low education or unemployed (Paneo et al., 2023).

Personal and environmental hygiene plays an important role in preventing TB transmission. Humid environments with poor ventilation and limited sunlight facilitate TB bacteria survival. Preventive measures include maintaining personal hygiene, wearing masks, and practicing cough etiquette. Poor hygiene, non-adherence to treatment, and inconsistent mask use increase the risk of TB transmission within households (Ismawati et al., 2023).

Several factors contributing to pulmonary TB relapse include comorbid diabetes mellitus, poor treatment adherence, exposure to cigarette smoke, inadequate home ventilation (<10%), household contact with TB patients, and undernutrition. Alcohol consumption increases relapse risk, while higher body mass index and lower population density are associated with reduced risk. Other factors include age, sex, education level, and comorbid malignancy (Ulfa et al., 2023).

Preventive efforts highlight the importance of health education, such as public health campaigns by healthcare workers on TB prevention and consistent treatment. Success in TB control is supported by community education and outreach, which encourage treatment adherence, vaccination, and hygiene maintenance (Ismawati et al., 2023).

Preliminary data from Nusa Indah Inpatient Ward, Pusri Hospital Palembang, showed 213 pulmonary TB cases in 2022, with 50 cases recorded in September–October 2023. Many were relapse cases due to insufficient patient information and understanding regarding TB relapse prevention. Two elderly patients had relapsed three times within the last two years, primarily due to poor adherence and limited family awareness. To address this, the author implemented an evidence-based nursing intervention using an educational booklet entitled “Preventing Recurrent Pulmonary TB”. The outcomes were analyzed and compared between the two cases to evaluate the effectiveness of the booklet-based education.

RESEARCH METHODS

This study employed a systematic review design following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 guidelines. The review aimed to synthesize evidence on the effectiveness of booklet-based educational interventions delivered by nurses in preventing pulmonary tuberculosis (TB) relapse.

Inclusion criteria were: (1) studies involving pulmonary TB patients; (2) interventions using booklet-based education, either as a standalone approach or combined with nurse-led counseling; (3) study designs including randomized controlled trials (RCTs), quasi-experimental, or observational studies; (4) outcome measures including patient knowledge, medication adherence, self-care behavior, or TB relapse rate; (5) publications between 2018–2024; and (6) articles published in English or Indonesian with full text available. Studies focusing solely on pediatric TB, non-booklet interventions, or without measurable outcomes were excluded.

A comprehensive literature search was conducted in PubMed, ScienceDirect, Scopus, ProQuest, and Google Scholar from January 2018 to January 2024. Keywords and Boolean operators used were: (“pulmonary tuberculosis” OR “TB lung”) AND (“booklet” OR “printed educational material”) AND (“nursing intervention” OR “nursing practice”) AND (“relapse prevention” OR “recurrence prevention”).

All search results were imported into Mendeley to remove duplicates. Two independent reviewers screened titles and abstracts for relevance, followed by full-text review against eligibility criteria. Disagreements were resolved through discussion or third-party adjudication.

Data extracted included: author(s), year, country, study design, sample size, intervention details, duration, outcome measures, and main findings. Quality appraisal was conducted using the

Joanna Briggs Institute (JBI) Critical Appraisal Checklist for RCTs and quasi-experimental studies. A thematic synthesis approach was applied to summarize evidence narratively, given the heterogeneity of study designs and outcome measures.

RESULTS AND DISCUSSION

Based on the literature search conducted across five databases, a total of 87,660 articles were initially identified that matched the specified keywords (Figure 1). The retrieved articles were then imported into the Mendeley Reference Manager desktop application to assess their relevance to the current study. The first screening stage involved removing duplicate records ($n = 54,233$). Subsequently, 17,695 articles underwent screening based on title and abstract to evaluate topic suitability. Articles that did not meet the inclusion criteria were excluded from the study ($n = 7,397$). After the final eligibility assessment, 17 articles were included in this review.

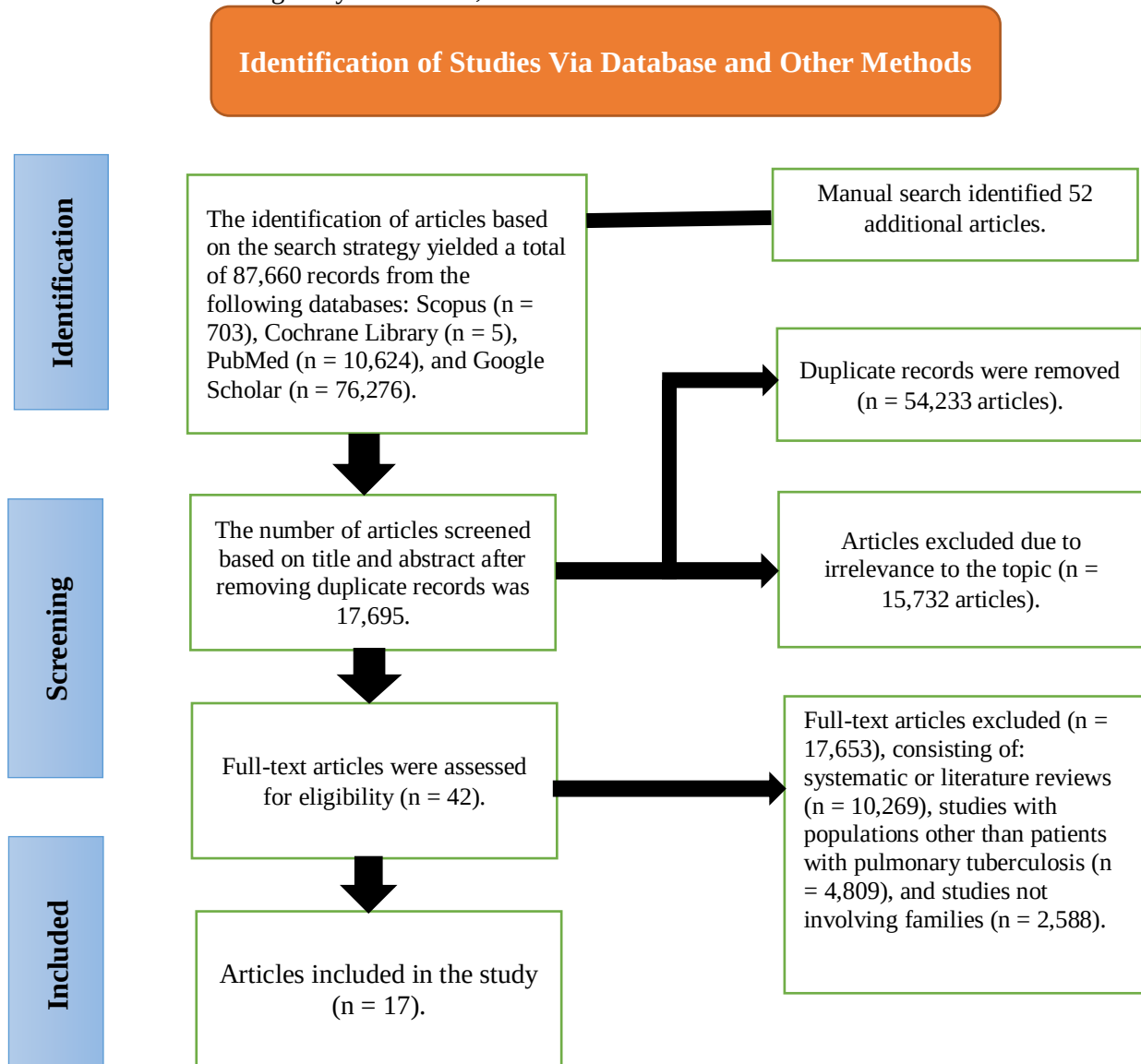


Figure 2.1. PRISMA Flow Diagram

The risk of bias in the studies included in this review was assessed using the JBI critical appraisal tool. Seventeen eligible articles were appraised and summarized in the attached table. A total of 523 participants were involved across the studies, with sample sizes ranging from 32 to 108 participants and an average age of 48.9 years. All respondents were either family members of pulmonary TB patients or patients themselves who had been diagnosed for more than one year and

had experienced relapse. Across all studies, educational interventions were provided to the families of pulmonary TB patients, and knowledge levels were measured using questionnaires on TB prevention.

Owa and Rochmawati (2020) reported that family knowledge scores increased from 92.1% to 100% after receiving a booklet, while attitudes improved from 69.8% to 76.2%. The Wilcoxon Signed Test indicated significant improvements in both knowledge and attitudes toward TB prevention. Similarly, Pangestika et al. (2019) found that education on TB symptoms, transmission, and prevention through Clean and Healthy Living Behavior (PHBS) campaigns, posters, leaflets, supplementary food, and masks increased knowledge about TB disease (71.4%), transmission mechanisms (71.4%), treatment (80%), and prevention through PHBS (100%), with an overall average increase of 80.7%. Hanye et al. (2023) identified knowledge and preventive behavior as key barriers to TB control among contacts. Their quasi-experimental study demonstrated that both booklet and WhatsApp-based education significantly improved knowledge, with WhatsApp proving more effective ($p = 0.014$).

Fitriyani and Dwijayanti (2023) reported that before education, most participants had low knowledge levels, but post-intervention there was a marked shift, with the majority achieving good knowledge scores. Windiyaningsih et al. (2019) found that lectures, Q&A sessions, printed materials, and simulations significantly improved TB prevention knowledge, attitudes, and behaviors, although these effects diminished after one month without follow-up education. Salsabilah and Mulyanto (2022) showed that e-booklet interventions significantly improved caregiver knowledge of elderly TB patients ($p = 0.04$), while Rahayu et al. (2022) found that booklet-based education significantly enhanced families' abilities to prevent infectious diseases in the elderly ($p = 0.000$).

Suparno et al. (2022) demonstrated that telehealth-based education significantly improved participants' understanding and support capabilities, particularly among certain age and education groups, though no significant effects were observed in older or less-educated participants. Widia et al. (2022) reported improved patient and family knowledge about TB and their role in treatment adherence. Sormin and Puri (2022) found significant improvements in participants' ability to provide emotional, instrumental, informational, and motivational support to TB patients ($p = 0.008$). Audiovisual education also proved effective, with Suhedi et al. (2022) reporting significant increases in medication adherence ($p = 0.000$).

Community education programs also demonstrated positive outcomes. Hapipah et al. (2021) found that proper cough etiquette education significantly increased residents' knowledge. Suhartati et al. (2023) reported a 96% improvement in TB-related knowledge following community service activities, and Alamsyah et al. (2021) observed that 80% of participants understood TB and 70% understood its prevention and treatment after counseling. Aisyah et al. (2023) reported moderate improvements in PKK cadres' knowledge following TB education, with the largest gains seen in understanding the family's role in prevention. Bastiana et al. (2023) demonstrated significant knowledge increases ($p = 0.003$) after TB screening and education sessions for santri in Madura. Lastly, Wati et al. (2022) reported that TB prevention counseling in Taba Melintang significantly improved knowledge levels, supplemented by free treatment services for residents.

Seventeen eligible studies involving 523 participants were critically appraised using the JBI tool, with sample sizes ranging from 32 to 108 participants and a mean age of 48.9 years. All respondents were either pulmonary TB patients with a history of relapse (>1 year since diagnosis) or family members of such patients. Educational interventions were the primary strategy across studies, targeting improvements in knowledge, attitudes, and preventive behaviors toward TB.

Booklet-Based Education

Several studies demonstrated the effectiveness of printed booklet interventions. Owa and Rochmawati (2020) reported an increase in family knowledge from 92.1% to 100% and improved attitudes from 69.8% to 76.2% after receiving a booklet, with significant changes confirmed by the Wilcoxon Signed Test. Rahayu et al. (2022) also found significant improvements in families' abilities to prevent infectious diseases among the elderly ($p = 0.000$).

Digital and E-Booklet Media

E-booklets and digital education showed promising results. Salsabilah and Mulyanto (2022) reported a significant improvement in caregiver knowledge for elderly TB patients in Bekasi ($p = 0.04$). Hanye

et al. (2023) found that both booklet and WhatsApp-based education were effective, though WhatsApp produced greater knowledge gains ($p = 0.014$).

Community and Group Education

Community-based programs also showed strong impacts. Pangestika et al. (2019) reported an average 80.7% increase in knowledge on TB prevention through Clean and Healthy Living Behavior (PHBS) campaigns, posters, leaflets, and supplementary food distribution. Bastiana et al. (2023) observed significant improvements ($p = 0.003$) following TB screening and education for santri in Madura, while Suhartati et al. (2023) reported a 96% increase in knowledge in community service settings.

Telehealth Interventions

Telehealth platforms expanded reach and maintained educational impact. Suparno et al. (2022) showed significant improvements in understanding and support capabilities among younger and moderately educated participants, although no significant effects were observed in older or less-educated groups.

Audiovisual and Simulation Approaches

Multimedia approaches also proved beneficial. Suhedi et al. (2022) found that audiovisual education significantly increased medication adherence among TB patients ($p = 0.000$). Windiyaningsih et al. (2019) reported immediate gains in knowledge, attitudes, and behaviors following lectures, Q&A sessions, and simulations, although effects diminished after one month without reinforcement.

Cough Etiquette and Basic Prevention Education

Basic preventive education interventions were consistently effective. Hapipah et al. (2021) demonstrated significant knowledge gains in proper cough etiquette. Alamsyah et al. (2021) found that 80% of participants understood TB and 70% understood prevention and treatment methods post-counseling. Aisyah et al. (2023) reported moderate knowledge gains among PKK cadres, particularly regarding the family's role in prevention. Overall, interventions—whether through booklets, digital media, telehealth, audiovisual formats, or community engagement—consistently improved TB-related knowledge and prevention behaviors, with digital and interactive methods showing particularly strong and sustained effects.

CONCLUSION

The findings of this review suggest that TB prevention programs should adopt a multi-modal educational approach that combines traditional printed materials with digital and interactive methods. Health workers can enhance the effectiveness of TB education by integrating booklet-based information with mobile platforms such as WhatsApp, telehealth consultations, and audiovisual media to reinforce learning and engagement. Community-based initiatives—such as PHBS campaigns, group discussions, and screening events—should be embedded within local health strategies to promote collective awareness and behavior change. Continuous reinforcement through follow-up sessions is critical to sustaining knowledge gains, particularly in high-risk populations and among those with lower educational attainment. By tailoring educational interventions to cultural contexts and leveraging both in-person and digital tools, TB control programs can achieve broader reach, stronger community participation, and more sustainable prevention outcomes.

REFERENCES

- Aisyah et.al. (2023). Edukasi Tuberkulosis (Tb) Kepada Kader Pemberdayaan Kesejahteraan Keluarga (Pkk) Kelurahan Duren Sawit. Jurnal Bakti Untuk Negeri. Volume 3 No. 2, November 2023 (123-133). ISSN 2798-3412 E-ISSN 2776-6055. <https://doi.org/10.36387/jbn.v3i2.1585>
- Apriani, A dan Kumalasari, M. L. F. 2015. Pengaruh Pendidikan Kesehatan Dengan Booklet Terhadap Pengetahuan Dan Sikap Tentang Deteksi Dini Kanker Payudara Pada Wus Di Surakarta Jawa Tengah. 6 (1). Diakses dari URL <http://jurnal.stikeskusumahusada.ac.id/index.php/JK/article/view/201> tanggal 27 November 2023.

- Bastiana et.al. (2023). Pelatihan Skrining Dan Edukasi Tuberkulosis Pada Santri Husada Di PP Al-Hikam Bangkalan. *Communnity Development Journal* Vol.4 No. 5 Tahun 2023, Hal. 11301-11305.
- Black J.M, Hawks J.H. (2014). *Keperawatan Medikal Bedah: Manajemen Klinis untuk Hasil yang Diharapkan* (3-vol set). Edisi Bahasa Indonesia 8. Singapore: Elsevier (S) Pte Ltd.
- Fitriyani & Dwijayanti. (2023). Edukasi Teori Health Beliefmodel Pada Pasien Tuberkulosis Di Kecamatan Pancoran Mas Kota Depok. *Communnity Development Journal*. Vol.4,No.2Juni 2023,Hal.2586-2589
- Grodner M, Escott-Stump S, Dorner S. (2016). *Nutritional Foundations and Clinical Application: A Nursing Approach*. 6th edition. St. Louis: Mosby Elsevier.
- Hanye et.al. (2023). The Effectiveness of Health Education Using Media Booklets and WhatsApp on Tuberculosis Patients at the Linggang Bigung Health Center, West Kutai Regency. *Formosa Journal of Science and Technology (FJST)*. Vol. 2, No. 4, 2023: 1145-1156.
- Hapipah et.al. (2021). Edukasi Etika Batuk Yang Benar Sebagai Upaya Pencegahan Penyakit TB Paru Di Dusun Aik Nyet Lombok Barat. *Jurnal Abdimas Kesehatan Perintis* 2 (2) 2021: 17-21.
- Huether S.E, and McCance K.L. (2016). *Understanding Pathophysiology*. 6th edition. Mosby : Elsevier Inc.
- Ismawati, et.al. (2023). Pelatihan Pencegahan Tuberkulosis pada Kader Posyandu dan Tokoh Masyarakat di Desa KasangLimau Sundai, Kuantan Singingi. *Unri Conference Series: Community Engagement*. Volume 5, ISSN2685-9017.
- Ma'munah, M. 2015. Pengaruh Pendidikan Kesehatan Dengan Booklet Terhadap Pengetahuan Nutrisi Ibu Laktasi Di Wilayah Kerja Puskesmas Ciputat Timur. Diakses dari URL repository.uinjkt.ac.id/dspace/bitstream/ /1/Malikatul%20Ma%27munah- fkik.pdf tanggal 27 November 2023.
- Mahmudianti, et.al. (2024). Application of Effective Cough on Increasing Oxygen Saturation (SPO2) on Patients with Tuberculosis at Paru Center RSUD Ulin Banjarmasin. *Journal of Health (JoH)* - Vol. 11 No. 1 (2024), 085-094.
- Maisyaroh & Retnaningsih. (2024). Pengaruh Aplikasi Edukasi Terhadap Tingkat Kecemasan Pada Pasien Tuberkulosis Paru. *Jurnal Keperawatan* Volume 16 Nomor 3, September 2024 e-ISSN 2549-8118; p-ISSN2085-1049 <http://journal.stikeskendal.ac.id/index.php/Keperawatan>.
- McCuistion L.E, Kee J.L and Hayes E.R. (2014). *Pharmacology: A patient Centered Nursing Process Approach*. 8th ed. Saunders: Elsevier Inc.
- Notoatmodjo, S. (2014). *Promosi Kesehatan dan Perilaku Kesehatan*. Jakarta: Rineka Cipta.
- Nursalam. (2020). *Metodologi Penelitian Ilmu Keperawatan: Pendekatan Praktis Edisi 5*. Jakarta Selatan : Salemba Medika.
- Owa & Rochmawati. (2020). Efektifitas Edukasi TB Paru melalui Booklet Berbahasa Tetun Terhadap Pengetahuan dan Sikap Keluarga Dalam Pencegahan Penularan TB Paru di Centru Saude Comoro, Dili, Timor Leste. *Wiraraja Medika : Jurnal Kesehatan* Vol. 10 No. 1 Tahun 2020|29–35,
- Pallunan & Langan. (2023). Asuhan Keperawatan Pada Pasien Dengan Tuberkulosis Paru Di Ruang Perawatan Isolasi Bernadeth Iii Rumah Sakit Stella Maris Makassar. *Program Studi Sarjana Keperawatan Dan Ners Sekolah Tinggi Ilmu Kesehatan Stella Maris Makassar*.
- Paneo, et.al. (2023). Pemberdayaan Kader Kesehatan Dalam Peningkatan Kemandirian Keluarga Pada Pencegahan Penularan Tb Paru Di Kel. Balocci Baru, Kec. Balocci, Kab. Pangkajene Kepulauan. *Jurnal Pengabdian Kepada Masyarakat Pelamonia* VOL. 3 Nomor 2 Tahun 2023. P-ISSN ; 2775-3549, e-ISSN: 2828-6588.
- Pangestika et.al. (2019). Edukasi Pencegahan Penularan Penyakit Tb Melalui Kontak Serumah. *Jurnal SOLMA*. Vol. 8, No. 2, pp. 229-238; 2019. Doi: <http://dx.doi.org/10.29405/solma.v8i2.3258>. ISSN (Print): 2252-584x. ISSN (Online): 2614-1531.
- Rahayu, D. Y. S., Usman, R. D., Umar , N., & Putri, D. P. (2022). Edukasi Menggunakan Booklet untuk Membantu Keluarga Mencegah Penyakit Menular pada Lansia. *Health Information : Jurnal Penelitian*, 14(1), 27–37. <https://doi.org/10.36990/hijp.v14i1.448> (Original work published 25 Juni 2022).
- Rammang & Revalina. (2024). Edukasi Perilaku Pencegahan Penyakit Tuberkulosis Di Rs. Woodward. *EJOIN–VOLUME 2NOMOR 1(2024)* : 118-122.

- Ramayanti et.al. (2024). Faktor-Faktor yang Berhubungan dengan Kepatuhan Berobat Penderita Tuberkulosis di POLI DOTS. *Lentera Perawat* E-ISSN : 2830-1846. Volume 5, No 1, Januari 2024.
- Rivana et.al. (2022). Keperawatan Medikal Bedah Sistem Pernapasan. *Morgensonne Media* : Palembang.
- Salsabilah & Mulyanto. (2022). Efektivitas Penggunaan Media E -Booklet Terhadap Pengetahuan Keluarga Tentang Perawatan Lansia Dengan Tuberkulosis di Wilayah Kerja UPTD Puskesmas Bahagia Kabupaten Bekasipada Tahun 2022. *Jurnal Pendidikan dan Konseling* Volume 4 Nomor 4 Tahun 2022 E-ISSN: 2685-936X dan P-ISSN: 2685-9351 Universitas Pahalwan Tuanku Tambusai
- Solihin & Alifah. (2021). Faktor Predisposisi, Pencegahan Dan Perilaku Sembuh Pasien Tuberkulosis Paru. *Jurnal Health Sains*: p-ISSN: 2723-4339 e-ISSN: 2548-1398. Vol. 2, No. 7, Juli 2021.
- Sormin & Puri. (2022). Pengaruh pengembangan multimedia edukasi dalam pemberdayaan keluarga memberi dukungan pengobatan penderita tuberkulosis paru. *Holistik Jurnal Kesehatan*, Volume 16, No.1, Maret 2022: 01-14.
- Suhartati et.al. (2023). Edukasi Tuberkulosis Paru Kepada Masyarakat Dalam Upaya Eliminasi TB. *JMM (Jurnal Masyarakat Mandiri)*. <http://journal.ummat.ac.id/index.php/jmm>. Vol. 7, No. 3, Juni 2023, Hal. 2778-2786. e-ISSN 2614-5758 | p-ISSN 2598-8158
- Suhedi, et.al. (2022). Pengaruh Edukasi Tuberkulosis Berbasis Audiovisual Terhadap Kepatuhan Minum Obat Pasien Tuberkulosis Paru di Puskesmas Setiabudi Kota Jakarta Selatan. *GLOBAL HEALTH SCIENCE* Volume 7 Number 1, March 2022 ISSN 2503-5088 (p) 2622-1055 (e). <http://jurnal.csdforum.com/index.php/ghs>. DOI: <http://dx.doi.org/10.33846/ghs7107>
- Supariasa, I. D. N., and Suiroaka. I. P. 2012. *Media Pendidikan Kesehatan*. Yogyakarta : Graha Ilmu.
- Suparno et.al. (2022). Pengaruh Edukasi Berbasis Telehealth Terhadap Pemahaman Tb Paru Pada Keluarga High Risk Di Wilayah Kerja Puskesmas Tumb Tumbu Jaya Konawe Selatan. *JURNAL ILMIAH OBSGIN- VOL.14 NO.4 (2022)*.
- Tim Pokja SDKI DPP PPNI. (2017). *Standar Diagnosa Keperawatan Indonesia*.
- Tumiwa et.al. (2023). Faktor-Faktor Determinan yang Berhubungan dengan Kejadian Ulang (Relaps) Pada Penderita TB Paru di RSUD X. *AKSARA: Jurnal Ilmu Pendidikan Nonformal*. P-ISSN 2407-8018 E-ISSN 2721-7310 DOI prefix 10.37905. Volume 09 (1) January 2023. <http://ejurnal.pps.ung.ac.id/index.php/Aksara>.
- Ulfa et.al. (2023). Faktor-Faktor Risiko Kejadian Tuberkulosis Paru Kambuh Di Puskesmas Kota Jambi Tahun 2020-2022. *e-SEHAD*, Volume 4, Nomor 1, Juni 2023, Hal: 08-18.
- Wati et.al. (2022). Edukasi Kesehatan Tentang Pencegahan Tuberkulosis Di Taba Melintang Wilayah Kerja Puskesmas Bentiring. *Sambulu Gana : Jurnal Pengabdian Masyarakat* | Volume 1 Nomor 1, Januari 2022.
- Wough A, Grant A. (2014). *Buku Kerja Anatomi dan Fisiologi Ross dan Wilson*. Edisi Bahasa Indonesia 3. Churchill Livingstone : Elsevier (Singapore) Pte Ltd.
- Widia et.al. (2022). Optimalisasi Pengetahuan Pasien dan Keluarga dalam Penanggulangan Tuberkulosis Paru di Wilayah Kerja Puskesmas Purbaratu Kota Tasikmalaya. *ABDIMAS MULAWARMAN. Jurnal Pengabdian Kepada Masyarakat* Vol. 2 No. 2 Oktober 2022 Hal. 77-84
- Windiyarningsih et.al. (2019). Pencegahan Dan Penularan Tuberkulosis Melalui Pemberdayaan Wanita Usia Subur DI RPTRA Payung Tunas Teratai Jakarta Timur Tahun 2019. *Jurnal Pelayanan dan Pengabdian Masyarakat (PAMAS)* e-ISSN : 2685-6301. Vol. 3, No.2 Oktober 2019. p-ISSN : 2685-5968