



UNIVERSITAS BINA SEHAT PPNI MOJOKERTO

**ANALISIS PENERAPAN INTERVENSI *ACTIVE CYCLE OF BREATHING
TECHNIQUE* PADA PASIEN PPOK DENGAN MASALAH BERSIHAN
JALAN NAPAS TIDAK EFEKTIF DI RUANG HELICONIA
RSUD IBNU SINA GRESIK**

KARYA AKHIR ILMIAH NERS

**AYNIN ROUDHOTUL CHOLIFAH
202203049**

**FAKULTAS ILMU KESEHATAN
PROGRAM STUDI PROFESI NERS
UNIVERSITAS BINA SEHAT PPNI
MOJOKERTO
2023**



UNIVERSITAS BINA SEHAT PPNI MOJOKERTO

**ANALISIS PENERAPAN INTERVENSI *ACTIVE CYCLE OF BREATHING
TECHNIQUE* PADA PASIEN PPOK DENGAN MASALAH BERSIHAN
JALAN NAPAS TIDAK EFEKTIF DI RUANG HELICONIA
RSUD IBNU SINA GRESIK**

KARYA AKHIR ILMIAH NERS

Diajukan sebagai salah satu syarat untuk memperoleh gelar Ners

**AYNIN ROUDHOTUL CHOLIFAH
202203049**

**FAKULTAS ILMU KESEHATAN
PROGRAM STUDI PROFESI NERS
UNIVERSITAS BINA SEHAT PPNI
MOJOKERTO
2023**

HALAMAN PERNYATAAN ORISINALITAS

Karya ilmiah akhir Ners ini adalah hasil karya saya sendiri,
dan semua sumber baik yang dikutip maupun dirujuk
telah saya nyatakan benar.



LEMBAR PERSETUJUAN

Karya ilmiah akhir ners ini telah diperiksa dan disetujui isi serta susunannya, sehingga dapat diajukan dalam ujian sidang pada program studi Profesi Ners Fakultas Ilmu Kesehatan Universitas Bina Sehat PPNI

Judul : Analisis Penerapan Intervensi *Active Cycle of Breathing Technique* pada Pasien PPOK Dengan Masalah Keperawatan Bersihan Jalan Napas Tidak Efektif di Ruang Heliconia RSUD Ibnu Sina Gresik

Nama : Aynin Roudhotul Cholifah

NIM : 202203049

Pada Tanggal : 08 Agustus 2023

Oleh:



Pembimbing

Emyk Windartik, S. Kep. Ns., M. Kes
NIK.162 601 102

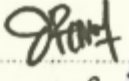
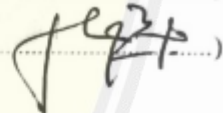
HALAMAN PENGESAHAN

Karya Ilmiah Akhir Ners (KIAN) ini diajukan oleh :

Nama : AYNIN ROUDHIOTUL CHOLIFAH
NIM : 202203049
Program Studi : Profesi Ners
Pada Tanggal : 14 September 2023
Judul Karya Ilmiah Akhir Ners (KIAN) : "Analisis Penerapan Intervensi *Active Cycle Of Breathing Technique* Pada Pasien PPOK Dengan Masalah Bersihan Jalan Napas Tidak Efektif Di Ruang Heliconia RSUD Ibnu Sina Gresik"

Telah berhasil dipertahankan di hadapan Dosen Penguji dan diterima sebagai bagian persyaratan yang diperlukan untuk memperoleh gelar Ners pada Program Studi Profesi Ners Universitas Bina Sehat PPNI Mojokerto

DOSEN PENGUJI

Penguji Utama : Arum Dwi Ningsih, S.Kep.Ns., M.Kep (.....)
Penguji Satu : Emyk Windartik, S.Kep.Ns., M.Kes (.....)

Ditetapkan di : Mojokerto

Tanggal : 14 September 2023

Ka. Prodi Profesi Ners


Rina Nur Hidayati, M.Kep.Sp.Kep.Kom
NIK : 162 001 027

KATA PENGANTAR

Puji syukur penulis panjatkan kepada Allah SWT, karena atas ridho dan kehendak-Nya, penulis dapat menyelesaikan karya ilmiah akhir ners yang berjudul **“Analisis Penerapan Intervensi *Active Cycle of Breathing Technique* Pada Pasien PPOK Dengan Masalah Keperawatan Bersihan Jalan Napas Tidak Efektif di Ruang Heliconia RSUD Ibnu Sina Gresik”**. Penulisan karya ilmiah akhir ini merupakan salah satu syarat untuk mendapatkan gelar Ners di Fakultas Ilmu Kesehatan Universitas Bina Sehat PPNI Mojokerto.

Penulis menyadari bahwa dalam penulisan KIAN ini selain dari bantuan Allah Yang Maha Kuasa, terdapat pihak-pihak yang sudah Allah kirimkan untuk memberikan dukungan dan bantuan yang tidak terduga kepada saya. Oleh karena itu, apresiasi tertinggi saya ucapkan kepada:

1. dr. Soni, M. Kes selaku Direktur RSUD Ibnu Sina Gresik yang berkenan memberikan kesempatan penulis untuk menimba ilmu dan pengalaman di RSUD Ibnu Sina Gresik
2. Nanik, S. Kep. Ns selaku Kepala Ruang Heliconia RSUD Ibnu Sina Gresik yang telah mengizinkan penulis melakukan penyusunan asuhan keperawatan pada pasien PPOK di Ruang Heliconia RSUD Ibnu Sina Gresik.
3. Dr. Windu Santoso, S. Kp., M. Kep selaku Rektor Universitas Bina Sehat PPNI Mojokerto yang telah memberikan kesempatan penulis untuk menempuh pendidikan di Fakultas Ilmu Kesehatan Program Studi Profesi Ners Universitas Bina Sehat PPNI Mojokerto.
4. Ns. Rina Nur Hidayati, S. Kep., M. Kep., Sp. Kep. Kom selaku Kepala Program Studi Profesi Ners Universitas Bina Sehat PPNI Mojokerto yang telah memberikan dorongan untuk menyelesaikan pendidikan di Universitas Bina Sehat PPNI Mojokerto.
5. Ns. Arum Dwi Ningsih, S. Kep., M. Kes selaku dosen penguji sidang KIAN yang telah meluangkan waktu dan memberikan kritik serta saran untuk kesempurnaan laporan tugas akhir kepada penulis.

6. Ns. Emyk Windartik, S. Kep., M. Kes selaku dosen pembimbing yang telah meluangkan waktu dalam memberikan arahan, bimbingan dan masukan kepada penulis dalam menyelesaikan laporan tugas akhir.
7. Seluruh staff dosen dan civitas akademika Universitas Bina Sehat PPNI Mojokerto yang telah bertugas dalam terselesaikannya pembelajaran di Universitas Bina Sehat PPNI Mojokerto.
8. Seluruh klien Ruang Heliconia RSUD Ibnu Sina Gresik yang bersedia berpartisipasi dan bekerjasama untuk memberikan data dalam studi kasus.

Saya selalu berdo'a semoga Allah SWT membalas kebaikan seluruh pihak yang turut serta dalam penyusunan KIAN ini. Semoga KIAN ini dapat berguna dalam perkembangan riset dan keilmuan keperawatan.

Mojokerto, Agustus 2023



Penulis

DAFTAR ISI

HALAMAN PERNYATAAN ORISINALITAS	i
LEMBAR PERSETUJUAN	ii
HALAMAN PENGESAHAN	iii
KATA PENGANTAR	iv
ABSTRAK	vi
ABSTRACT	vii
DAFTAR ISI	viii
DAFTAR GAMBAR	x
DAFTAR TABEL	xi
DAFTAR LAMPIRAN	xii
DAFTAR SINGKATAN	xiii
BIODATA PENULIS	xiv
BAB 1 PENDAHULUAN	1
1.1 Latar Belakang	1
1.2 Tinjauan Pustaka	3
1.2.1 Konsep Penyakit “Penyakit Paru Obstruksi Kronis (PPOK)”	3
1.2.2 <i>Active Cycle of Breathing Technique</i> (ACBT) Sebagai Intervensi dalam Usaha Meningkatkan Ekspektorasi Volume Sputum	11
1.2.3 Peran Perawat Dalam Aplikasi Asuhan Keperawatan Pada Pasien Penyakit Paru Obstruktif Kronis (PPOK)	16
1.2.4 Konsep Asuhan Keperawatan Pada Pasien Dengan PPOK	17
1.3 Tujuan Penulisan	24
1.3.1 Tujuan Umum	24
1.3.2 Tujuan Khusus	24
1.4 Manfaat Penulisan	25
1.4.1 Manfaat Aplikatif	25
1.4.2 Manfaat Keilmuan	25
BAB 2 GAMBARAN KASUS KELOLAAN UTAMA	26
2.1 Pengkajian	26
2.1.1 Identitas Klien	26
2.1.2 Riwayat Kesehatan	26
2.1.3 Pemeriksaan Fisik	27
2.1.4 Pemeriksaan Penunjang	30
2.1.5 Terapi Medis	31
2.1.6 Analisa Data	32
2.2 Diagnosis dan Prioritas Masalah	32
2.3 Rencana Tindakan Keperawatan	33
2.4 Implementasi Tindakan Keperawatan	33
2.5 Evaluasi Tindakan Keperawatan	35
BAB 3 PEMBAHASAN	37
3.1 Analisis Asuhan Keperawatan dengan Konsep Kasus Terkait	37
3.1.1 Pengkajian	37
3.1.2 Diagnosis Keperawatan	39
3.1.3 Perencanaan Tindakan Keperawatan	40
3.1.4 Implementasi	41
3.1.5 Evaluasi	42

3.2 Analisis Penerapan Intervensi <i>Active Cycle of Breathing Technique</i> Pada Pasien PPOK Dalam Meningkatkan Ekspektorasi Volume Sputum	43
3.3 Implikasi Keperawatan	45
BAB 4 PENUTUP	47
4.1 Kesimpulan.....	47
4.2 Saran	48
4.2.1 Instansi Penyedia Layanan Kesehatan	48
4.2.2 Pendidikan Keperawatan.....	48
DAFTAR PUSTAKA	49
LAMPIRAN	57



DAFTAR GAMBAR

Gambar 1.1	Proses <i>air-trapping</i> pada PPOK	4
Gambar 1.2	Skematik Teknikal Prosedur <i>Active Cycle of Breathing Technique</i> (ACBT)	12
Gambar 2.1	Hasil Pemeriksaan <i>Pulmonary Fuctional Test: Spirometri</i> Ny. NH (45 th) dengan Diagnosa Medis PPOK.....	31
Gambar 3.1	<i>Flowchart</i> pelaksanaan ACBT.....	44



DAFTAR TABEL

Tabel 1.1	Analisis PICO <i>Role of active cycle of breathing technique for patients with chronic obstructive pulmonary disease: A pragmatic, randomized clinical trial</i>	13
Tabel 1.2	Analisis PICO Pengaruh <i>Active Cycle of Breathing Technique</i> Terhadap Peningkatan Nilai VEP1, Jumlah Sputum, dan Mobilisasi Sangkar Thoraks Pasien PPOK.....	14
Tabel 1.3	Analisis PICO <i>Effect of active cycle of breathing techniques in patients with chronic obstructive pulmonary disease: A systematic review of intervention</i>	14
Tabel 1.4	Analisis PICO <i>Intervention effects of active cycle of breathing techniques on patients with acute exacerbation of chronic obstructive pulmonary disease</i>	15
Tabel 1.5	Analisis PICO <i>Comparison of active cycle breathing technique (ACBT)/forced expiration technique (FET) vs. flutter device in facilitating sputum expectoration among stable COPD patients at UST hospital</i> 15	15
Tabel 1.6	Rencana Tindakan Keperawatan Pada Pasien Dengan PPOK Berdasarkan Diagnosis Keperawatan.....	23
Tabel 2.1	Hasil Pemeriksaan Laboratorium Darah Lengkap Ny. NH (45 th) dengan Diagnosa Medis PPOK.....	30
Tabel 2.2	Analisa Data Pengkajian Keperawatan Ny. NH (45 th) dengan Diagnosa Medis PPOK.....	32
Tabel 2.3	Evaluasi Tindakan Keperawatan Bersihan Jalan Napas Tidak Efektif Pada Ny. NH (45 Th) Dengan Diagnosa Medis PPOK.....	35

BINA SEHAT PPNI

DAFTAR LAMPIRAN

Lampiran 1: Resume Asuhan Keperawatan.....	57
Lampiran 2: Pathway Penyakit Paru Obstruksi Kronis (PPOK).....	70
Lampiran 3: Pelaksanaan Tindakan Keperawatan Ny. NH (45 th).....	71
Lampiran 4: Dokumentasi.....	74



DAFTAR SINGKATAN

GOLD	: <i>Global Initiative for Chronic Obstructive Lung Disease</i>
A1AT	: Alpha 1 Antitrypsin
AATD	: <i>Alpha-1 antitrypsin deficiency</i>
ACT	: <i>Airway Clearance Technique</i>
ADAM33	: <i>ADAM metallopeptidase domain 33</i>
b.d	: berhubungan dengan
FEV1	: <i>Forced Expiratory Volume in the first second</i>
FVC	: <i>Forced Vital Capacity</i>
KVP	: Kapasitas Vital Paksa
MMP12	: <i>matrix metallopeptidase 12</i>
RISKESDAS	: Riset Kesehatan Dasar
SDKI	: Standar Diagnosis Keperawatan Indonesia
SERPINE2	: <i>serpin family E member 2</i>
SIKI	: Standar Intervensi Keperawatan Indonesia
SLKI	: Standar Luaran Keperawatan Indonesia
TNS1	: <i>Tensin 1</i>
VAP	: <i>Ventilator Associated Pneumonia</i>
VEP1	: Volume Ekspirasi Paksa pada 1 detik pertama



BIODATA PENULIS



Nama : Aynin Roudhotul Cholifah
Tempat, Tanggal Lahir : Mojokerto, 13 Desember 2000
Jenis Kelamin : Perempuan
Alamat Rumah : Bamban, Wonoploso RT/RW 002/001, Kecamatan Gondang, Kabupaten Mojokerto
Agama : Islam
Alamat *email* : ayninrouhotulc@gmail.com

Riwayat Pendidikan

No.	Nama Sekolah	Tahun
1	RA Al Hikmah Pohjejer	2005-2006
2	MI Pancasila Pohjejer	2006-2012
3	MTs Miftahul Ulum Gondang	2012-2015
4	SMAN 1 Gondang	2015-2018
5	S1 Ilmu Keperawatan Universitas Bina Sehat PPNI Mojokerto	2018-2022
6	Profesi Ners Universitas Bina Sehat PPNI Mojokerto	2022-2023

DAFTAR PUSTAKA

- Adeloye, D., Song, P., Zhu, Y., Campbell, H., Sheikh, A., & Rudan, I. (2022). Global, regional, and national prevalence of, and risk factors for, chronic obstructive pulmonary disease (COPD) in 2019: a systematic review and modelling analysis. *The Lancet Respiratory Medicine*, *10*(5), 447–458. [https://doi.org/10.1016/S2213-2600\(21\)00511-7](https://doi.org/10.1016/S2213-2600(21)00511-7)
- Agarwal, A. K., Raja, A., & Brown, B. D. (2022). Chronic Obstructive Pulmonary Disease. In *StatPearls [Internet]*. StatPearls Publishing. <https://www.ncbi.nlm.nih.gov/books/NBK559281/>
- Ai, L., Zhang, J., & Bo, W. (2022). Respiratory failure in intensive care unit patients with progressive COPD: Nursing approaches to patient care. *Alternative Therapies in Health and Medicine*, *28*(1), 52–57.
- Andrews, J., Sathe, N. A., Krishnaswami, S., & Melissa, L. (2013). Nonpharmacologic airway clearance techniques in hospitalized patients: A systematic review. *Respiratory Care*, *58*(12), 2160–2186. <https://doi.org/10.4187/respcare.02704>
- Aoshiba, K., Tsuji, T., Yamaguchi, K., Itoh, M., & Nakamura, H. (2013). The danger signal plus DNA damage two-hit hypothesis for chronic inflammation in COPD. *European Respiratory Journal*, *42*(6), 1689–1695. <https://doi.org/10.1183/09031936.00102912>
- Asih, N. G. Y., & Effendy, C. (2004). *Keperawatan Medikal Bedah: Klien dengan Gangguan Sistem Pernapasan* (1st ed.). ECG.
- Athawale, V. K., Lalwani, L. L., & Mishra, G. P. (2020). Comparison of the Active Cycle of Breathing Technique (ACBT) versus Active Cycle of Breathing Technique with Flutter in Bronchiectasis. *National Journal of Medical Research*, *10*(4), 178–180. <https://doi.org/10.6084/M9.FIGSHARE.13727290>
- Belli, S., Prince, I., Savio, G., Paracchini, E., Cattaneo, D., Bianchi, M., Masocco, F., Bellanti, M. T., & Balbi, B. (2021). Airway Clearance Techniques: The Right Choice for the Right Patient. *Frontiers in Medicine*, *8*(February), 1–10. <https://doi.org/10.3389/fmed.2021.544826>
- Bott, J., Blumenthal, S., Buxton, M., Ellum, S., Falconer, C., Garrod, R., Harvey, A., Hughes, T., Lincoln, M., Mikelsons, C., Potter, C., Pryor, J., Rimington, L., Sinfield, F., Thompson, C., Vaughn, P., & White, J. (2009). Guidelines for the physiotherapy management of the adult, medical, spontaneously breathing patient. *Thorax*, *64*(Suppl. 1), i1–i15. <https://doi.org/10.1136/thx.2008.110726>

- Braeken, D. C. W., Houben-wilke, S., Smid, D. E., & Wouters, E. F. M. (2016). Sputum microbiology predicts health status in COPD. *International Journal of COPD*, *11*(November), 2741–2748. <https://doi.org/10.2147/COPD.S117079>
- Bulechek, G., Butcher, H., Dochterman, J., & Wagner, C. (2016). Nursing Interventions Classification (NIC), 6th Indonesian edition. In I. Nurjannah & R. D. Tumanggor (Eds.), *Nursing Interventions Classification (NIC)* (6th ed.). Mocomedia.
- Burgel, P.-R. (2013). Cough and sputum production in COPD patients: clinical phenotype or markers of disease activity? *The International Journal of Clinical Paractice*, *67*(12 (December)), 1218–1219. <https://doi.org/10.1111/ijcp.12257>
- Cabillic, M., Gouilly, P., & Reychler, G. (2018). Manual airway clearance techniques in adults and adolescents: What level of evidence? *Revue Des Maladies Respiratoires*, *35*(5), 495–520. <https://doi.org/10.1016/j.rmr.2015.12.004>
- Cartuliales, M. B., Skjøt-Arkil, H., Rosenvinge, F. S., Mogensen, C. B., Skovsted, T. A., & Pedersen, A. K. (2021). Effectiveness of expiratory technique and induced sputum in obtaining good quality sputum from patients acutely hospitalized with suspected lower respiratory tract infection: a statistical analysis plan for a randomized controlled trial. *Trials*, *22*(1), 1–13. <https://doi.org/10.1186/s13063-021-05639-1>
- Celli, B. R., & Wedzicha, J. A. (2019). Update on Clinical Aspects of Chronic Obstructive Pulmonary Disease. *New England Journal of Medicine*, *381*(13), 1257–1266. <https://doi.org/10.1056/nejmra1900500>
- Chaves, D. B. R., Pascoal, L. M., Beltrão, B. A., Nunes, M. M., Leandro, T. A., Silva, V. M. da, & Lopes, M. V. de O. (2018). Classification tree to screen for the nursing diagnosis Ineffective airway clearance. *Revista Brasileira de Enfermagem*, *71*(5), 2353–2358. <https://doi.org/10.1590/0034-7167-2017-0085>
- Cross, J. L., Elender, F., Barton, G., Clark, A., Shepstone, L., Blyth, A., Bachmann, M. O., & Harvey, I. (2012). Evaluation of the effectiveness of manual chest physiotherapy techniques on quality of life at six months post exacerbation of COPD (MATREX): a randomised controlled equivalence trial. *BMC Pulmonary Medicine*, *12*(1), 1–9. <https://doi.org/10.1186/1471-2466-12-33>
- Easter, M., Bollenbecker, S., Barnes, J. W., & Krick, S. (2020). Targeting aging pathways in chronic obstructive pulmonary disease. *International Journal of Molecular Sciences*, *21*(18), 1–17. <https://doi.org/10.3390/ijms21186924>

- Fiorentino, G., Esquinas, A. M., & Annunziata, A. (2020). Exercise and Chronic Obstructive Pulmonary Disease (COPD). In J. Xiao (Ed.), *Advances in Experimental Medicine and Biology: Physical Exercise For Human Health* (Vol. 1228, pp. 355–368). Springer. https://doi.org/https://doi.org/10.1007/978-981-15-1792-1_24
- GOLD. (2020). *Global strategy for the diagnosis, management, and prevention of chronic obstructive pulmonary disease (2021 report)*. (p. 164). GOLD, Inc. <https://goldcopd.org>.
- GOLD. (2023). Global Initiative for Chronic Obstructive Lung: Global Strategy for the Diagnosis, Management, and Prevention of COPD. In *A Guide for Health Care Professionals* (Vol. 1, Issue 3).
- Hastie, A. T., Martinez, F. J., Curtis, J. L., Doerschuk, C. M., Hansel, N. N., Christenson, S. A., Putcha, N., Ortega, V. E., Li, X., Barr, R. G., Carretta, E. E., Couper, D. J., Cooper, C. B., Hoffman, E. A., Kanner, R. E., Kleeerup, E. C., O'Neal, W. K., Paine, R., Peters, S. P., ... Wise, R. A. (2017). Sputum or blood eosinophil association with clinical measures of COPD severity in the SPIROMICS cohort. *The Lancet Respiratory Medicine*, 5(12), 956–967. [https://doi.org/10.1016/S2213-2600\(17\)30432-0](https://doi.org/10.1016/S2213-2600(17)30432-0)
- Hazelett, B. N., Paton, A., Majid, A., Schreefer, K., Folch, E., Johnson, M. M., Patel, N. M., Abia-Trujillo, D., & Fernandez-Bussy, S. (2021). Nurse Coordinator Roles and Responsibilities for Bronchoscopic Lung Volume Reduction With Endobronchial Valves. *Chest*, 159(5), 2090–2098. <https://doi.org/10.1016/j.chest.2020.11.041>.
- Herdman, T. H., & Kamitsuru, S. (2018). *NANDA Internasional Nursing Diagnoses: Definitions and Classification 2018-2020* (Elevant). Thieme.
- Hu, W., Li, T., Cao, S., Gu, Y., & Chen, L. (2022). Influence of Nurse-Led Health Education on Self-Management Ability, Satisfaction, and Compliance of Elderly Patients with Chronic Obstructive Pulmonary Disease Based on Knowledge, Belief, and Practice Model. *Computational and Mathematical Methods in Medicine*, 2022, 1–9. <https://doi.org/10.1155/2022/1782955>
- Huang, X., Mu, X., Deng, L., Fu, A., Pu, E., Tang, T., & Kong, X. (2019). The etiologic origins for chronic obstructive pulmonary disease. *Internasional Journal of Chronic Obstructive Pulmonary Disease*, 14(May), 1139–1158. <https://doi.org/10.2147/COPD.S203215>
- Huriah, T., & Ningtias, D. W. (2017). Pengaruh Active Cycle of Breathing Technique Terhadap Peningkatan Nilai VEP1, Jumlah Sputum, Dan Mobilisasi Sangkar Thoraks Pasien PPOK. *Indonesian Journal of Nursing Practices*, 1(2), 44–54. <https://doi.org/10.18196/ijnp.1260>

- Ides, K., Vissers, D., De Backer, L., Leemans, G., & De Backer, W. (2011). Airway clearance in COPD: Need for a breath of fresh air? A systematic review. *COPD: Journal of Chronic Obstructive Pulmonary Disease*, 8(3), 196–205. <https://doi.org/10.3109/15412555.2011.560582>
- Jácome, C., & Marques, A. (2015). Computerized respiratory sounds in patients with COPD: A systematic review. *COPD: Journal of Chronic Obstructive Pulmonary Disease*, 12(1), 104–112. <https://doi.org/10.3109/15412555.2014.908832>
- Kemenkes RI. (2021). *Merokok, Penyebab Utama Penyakit Paru Obstruktif Kronis*. Kementerian Kesehatan RI. <https://www.kemkes.go.id/article/view/21112300001/merokok-penyebab-utama-penyakit-paru-obstruktif-kronis.html>
- Kirkham, P. A., & Barnes, P. J. (2013). Oxidative stress in COPD. *Chest*, 144(1), 266–273. <https://doi.org/10.1378/chest.12-2664>
- Krzywkowski-Mohn, S. M. (2015). Primary Care and Interaction with Specialty Care for the COPD Patient. In R. J. Panos & W. L. Eschenbacher (Eds.), *A COPD Primer* (pp. 357–368). De Gruyter Open.
- Mardianti, T., & Sartika, M. (2022). *Pengaruh Terapi Active Cycle Breathing Technique (ACBT) Terhadap Pengeluaran Sputum pada Penderita Gangguan Sistem Respirasi Di Desa Cikarang Kota Kecamatan Cikarang Utara Kabupaten Bekasi Tahun 2022* (Issue September) [Universitas Medika Suherman]. <https://ecampus.medikasuherman.ac.id/h/imds/eKjIU0DkBjQa98xxTvfpFKQW2mxDAzZ.pdf>
- Melbye, H., Aviles Solis, J. C., Jácome, C., & Pasterkamp, H. (2021). Inspiratory crackles-early and late-revisited: Identifying copd by crackle characteristics. *BMJ Open Respiratory Research*, 8(1), 1–8. <https://doi.org/10.1136/bmjresp-2020-000852>
- Mosenifar, Z. (2022). *Chronic Obstructive Pulmonary Disease (COPD)*. Medscape. <https://emedicine.medscape.com/article/297664-overview>
- Mustamu, A. C., Fanbayo, R. A., Mobalen, O., & Djamanmona, R. F. (2023). *Buku Ajar Metodologi Keperawatan: Vol. Juni* (1st ed.). PT Nasya Expanding Management.
- Oshaug, K., Halvorsen, P. A., & Melbye, H. (2013). Should chest examination be reinstated in the early diagnosis of chronic obstructive pulmonary disease? *International Journal of COPD*, 8, 369–377. <https://doi.org/10.2147/COPD.S47992>

- Panaligan, R., Mesina, F., & Mateo, M. (2012). Comparison of active cycle breathing technique (ACBT)/forced expiration technique (FET) vs. flutter device in facilitating sputum expectoration among stable COPD patients at UST hospital. *European Respiratory Journal*, 40(Suppl 56), 2288. https://erj.ersjournals.com/content/40/Suppl_56/P2288
- Pascoal, L. M., Lopes, M. V. de O., da Silva, V. M., Beltrão, B. A., Chaves, D. B. R., Herdman, T. H., Lira, A. L. B. de C., Teixeira, I. X., & Costa, A. G. de S. (2016). Clinical indicators of ineffective airway clearance in children with acute respiratory infection. *Journal of Child Health Care*, 20(3), 324–332. <https://doi.org/10.1177/1367493515598648>
- Phillips, J., Hing, W., Pope, R., Canov, A., Harley, N., & Lee, A. L. (2023). Active cycle of breathing technique versus oscillating PEP therapy versus walking with huffing during an acute exacerbation of bronchiectasis: a randomised, controlled trial protocol. *BMC Pulmonary Medicine*, 23(1), 1–13. <https://doi.org/10.1186/s12890-023-02324-8>
- PPNI. (2016). *Standar Diagnosis Keperawatan Indonesia: Definisi dan Indikator Diagnostik* (Edisi 1). DPP PPNI.
- PPNI. (2018). *Standar Intervensi Keperawatan Indonesia: Definisi dan Tindakan Keperawatan* (Edisi 1). DPP PPNI.
- PPNI. (2019). *Standar Luaran Keperawatan Indonesia: Definisi dan Kriteria Hasil Keperawatan* (Edisi 1). DPP PPNI.
- Priscilla, L., Burke, K. M., & Bauldoff, G. (2015). *Medical surgical nursing: critical thinking in patient care* (W. Praptiani & A. Linda (eds.); 5th ed., Vol. 4). Pearson Education, Inc.
- Rabe, K. F., & Watz, H. (2017). Chronic obstructive pulmonary disease. *The Lancet*, 389(10082), 1931–1940. [https://doi.org/10.1016/S0140-6736\(17\)31222-9](https://doi.org/10.1016/S0140-6736(17)31222-9)
- Rehman, A., Azmi, M., Hassali, A., Abbas, S., Ali, I., & Hyder, B. (2020). Pharmacological and non-pharmacological management of COPD; limitations and future prospects: a review of current literature. *Journal of Public Health: From Theory to Practice*, 28(4), 357–366. <https://doi.org/10.1007/s10389-019-01021-3>
- Sandelowsky, H., Weinreich, U. M., Aarli, B. B., Sundh, J., Høines, K., Stratelis, G., Løkke, A., Janson, C., Jensen, C., & Larsson, K. (2021). COPD – do the right thing. *BMC Family Practice*, 22(224), 1–17. <https://doi.org/10.1186/s12875-021-01583-w>

- Santino, T. A., Chaves, G. S. S., Freitas, D. A., Fregonezi, G. A. F., & Mendonça, K. M. P. P. (2020). Breathing exercises for adults with asthma. *Cochrane Database of Systematic Reviews*, 3(3), 1–81. <https://doi.org/10.1002/14651858.CD001277.pub4>
- Scoditti, E., Massaro, M., Garbarino, S., & Toraldo, D. M. (2019). Role of diet in chronic obstructive pulmonary disease prevention and treatment. *Nutrients*, 11(6), 1–32. <https://doi.org/10.3390/nu11061357>
- Shah, B. K., Singh, B., Wang, Y., Xie, S., & Wang, C. (2023). Mucus Hypersecretion in Chronic Obstructive Pulmonary Disease and Its Treatment. *Mediators of Inflammation*, 2023(July), 1–15. <https://doi.org/10.1155/2023/8840594>
- Shen, M. D., Guo, L. R., Li, Y. W., Gao, R. T., Sui, X., Du, Z., Xu, L. Q., Shi, H. Y., Ni, Y. Y., Zhang, X., Pang, Y., Zhang, W., Yu, T. Z., & Li, F. (2021). Role of the active cycle of breathing technique combined with phonophoresis for the treatment of patients with chronic obstructive pulmonary disease (COPD): study protocol for a preliminary randomized controlled trial. *Trials*, 22(1), 1–10. <https://doi.org/10.1186/s13063-021-05184-x>
- Shen, M. D., Li, Y. W., Xu, L. Q., Shi, H. Y., Ni, Y. Y., Lin, H. J., & Li, F. (2021). Role of active cycle of breathing technique for patients with chronic obstructive pulmonary disease: A pragmatic, randomized clinical trial. *International Journal of Nursing Studies*, 117(103880), 1–11. <https://doi.org/10.1016/j.ijnurstu.2021.103880>
- Shen, M., Li, Y., Ding, X., Xu, L., Li, F., & Lin, H. (2020). Effect of active cycle of breathing techniques in patients with chronic obstructive pulmonary disease: A systematic review of intervention. *European Journal of Physical and Rehabilitation Medicine*, 56(5), 625–632. <https://doi.org/10.23736/S1973-9087.20.06144-4>
- Spencer, P., & Hanania, N. A. (2013). Optimizing safety of COPD treatments: role of the nurse practitioner. *Journal of Multidisciplinary Healthcare*, 6(February), 53–63. <https://doi.org/10.2147/JMDH.S35711>
- Suryati, I., Primal, D., & Sy, I. P. (2018). Perbedaan Active Cycle of Breathing Technique Dan Pursed Lips Breathing Technique Terhadap Frekuensi Nafas Nafas Pasien Paru Obstruksi Kronik. *Prosiding Seminar Kesehatan Perintis E*, 1(2), 2622–2256.
- Susenas Maret. (2022). *Rata-rata Jumlah Batang Rokok Per Minggu yang Dihisap Penduduk Usia 5 Tahun Ke atas yang Merokok Tembakau Sebulan Terakhir di Jawa Timur Menurut Kabupaten/Kota, Kelompok Umur, 2022*. BPS. <https://jatim.bps.go.id/statictable/2023/06/07/2782/rata-rata-jumlah-batang-rokok-per-minggu-yang-dihisap-penduduk-usia-5-tahun-ke-atas-yang-merokok-tembakau-sebulan-terakhir-di-jawa-timur-menurut-kabupaten-kota-kelompok-umur-2022.html>

- Umara, A. F., Prihandana, S., Netti, & Hidayat, A. (2022). *Buku Ajar Keperawatan Medikal Bedah S1 Keperawatan* (L. P. Fibriana (ed.); 1st ed.). Mahakarya Citra Utama.
- Üzmezoğlu, B., Altıay, G., Özdemir, L., Tuna, H., & Süt, N. (2018). The efficacy of flutter® and active cycle of breathing techniques in patients with bronchiectasis: A prospective, randomized, comparative study. *Turkish Thoracic Journal*, 19(3), 103–109. <https://doi.org/10.5152/TurkThoracJ.2018.17050>
- Vestbo, J. (2011). Clinical Assessment of COPD. In N. A. Hanania & A. Sharafkhaneh (Eds.), *COPD: a guide to diagnosis and clinical management* (pp. 21–33). Human Press. <https://doi.org/10.1007/978-1-59745-357-8>
- Vishvanath, P., Sarita, M., Sureshkumar, T., & Uma, P. (2016). A study to evaluate the effect of ACBT over autogenic drainage technique in COPD patients-a comparative study. *Indian Journal of Physiotherapy and Occupational Therapy*, 10(4), 86–90. <https://doi.org/10.5958/0973-5674.2016.00125.8>
- Westerdahl, E., Osadnik, C., & Emtner, M. (2019). Airway clearance techniques for patients with acute exacerbations of chronic obstructive pulmonary disease: Physical therapy practice in Sweden. *Chronic Respiratory Disease*, 16(May), 1–8. <https://doi.org/10.1177/1479973119855868>
- Yang, W., Li, F., Li, C., Meng, J., & Wang, Y. (2021). Focus on Early COPD: Definition and Early Lung Development. *International Journal of Chronic Obstructive Pulmonary Disease*, 16(November), 3217–3228. <https://doi.org/https://doi.org/10.2147/COPD.S338359>
- Yu, Y. (2013). *COPD: Pathogenesis*. The Calgary Guide to Understanding Disease. <https://calgaryguide.ucalgary.ca/?s=COPD>
- Zhang, L., & Gan, X. N. (2014). Intervention effects of active cycle of breathing techniques on patients with acute exacerbation of chronic obstructive pulmonary disease. *Journal of Shanghai Jiaotong University (Medical Science)*, 34(6), 855–858. <https://doi.org/10.3969/j.issn.1674-8115.2014.06.017>
- Zhang, X., Zhou, Q., Wang, S., Ma, Q., & Sun, Y. (2022). Etiology of Emergency Visit and In-Hospital Outcomes of Patients with COPD. *Emergency Medicine International*, 2022(August), 1–8. <https://doi.org/10.1155/2022/8247133>
- Zisi, D., Chryssanthopoulos, C., Nanas, S., & Philippou, A. (2022). The effectiveness of the active cycle of breathing technique in patients with chronic respiratory diseases: A systematic review. *Heart & Lung: The Journal of Critical Care*, 53(May-Jun), 89–98. <https://doi.org/https://doi.org/10.1016/j.hrtlng.2022.02.006>

Zuriati, Z., Surya, M., & Zahlimar. (2020). Effectiveness Active Cycle of Breathing Technique (ACBT) with Pursed Lips Breathing Technique (PLBT) to tripod position in increase oxygen saturation in patients with COPD, West Sumatera. *Enfermeria Clinica*, 30(2019), 164–167. <https://doi.org/10.1016/j.enfcli.2019.11.046>

