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ANALYSIS OF NURSING CARE FOR DIVERTICULITIS PATIENTS USING PROGRESSIVE MUSCLE RELAXATION THERAPY TO OVERCOME ANXIETY AT DARMO HOSPITAL SURABAYA

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Abstract

Introduction: Diverticulitis is a disease caused by an unhealthy lifestyle, lack of dietary fiber intake and a high-fat diet as well as a lack of physical activity are the main triggers for this disease. In diverticulitis sufferers, anxiety problems often arise due to concerns about their health condition in the future and what their health status will be if surgery is performed.

Objective: This study aims to determine the description of nursing care and analyze the application of progressive muscle relaxation therapy in diverticulitis patients with anxiety problems.

Methods: This research uses a case study method by providing nursing care through a nursing process approach. The research was conducted at Darmo Hospital Surabaya on 23-25 September 2022 by applying progressive muscle relaxation therapy to 1 respondent for 3 days with an intensity of 2x/day with a duration of 15-20 minutes, evaluating the patient using the Hamilton Rating Scale for Anxiety instrument (HARS).

Results: The results of this case study show a decrease in the level of anxiety felt by the patient after being given progressive muscle relaxation therapy. The level of anxiety decreased from moderate anxiety (score 22) to mild anxiety (score 14), the patient appeared calm and relaxed, and the patient's pulse decreased. This research concludes that the application of progressive muscle relaxation therapy can be an alternative to reduce anxiety in diverticulitis patients.

Conclusions*:* However, the findings should be interpreted with cautiously due to the study's reliance on a single case and the short intervention period. Future research should explore the long-term effects of progressive muscle relaxation therapy on a larger and more diverse patient population.

INTRODUCTION

Diverticulitis is inflammation of the diverticula (small, protruding sacs that can form in the lining of the digestive system, especially in the colon) It is an important complication of diverticular disease (Strate, 2019). The initial symptoms of diverticulitis are abdominal pain (most often in the lower left quadrant), nausea, vomiting, constipation, fever, and flatulence (Ghoulam, 2019). Chronicity and repeated attacks can cause poor quality of life, emotional stress, depression, and anxiety, internal factors

such as young age cause anxiety to arise because patients are more worried about their disease which often recurs, and are afraid of their condition in the future. (Rachel Champeau, 2018) In Indonesia, the Ministry of Health data on the prevalence of diverticulitis is not yet available, Generally speaking, in Southeast Asia the prevalence varies between 8 and 25%, reaching a peak in the 5th decade, affecting the right colon in 70-98% of cases (Violi, Alessandra, et al, 2018). At Darmo Hospital in Surabaya, diverticulitis cases are not yet in the top 10, but data in the last 2 months, namely in July and August, saw 10 inpatients and 17 outpatients. The results of interviews with 4 patients suffering from diverticulitis showed that 1 person aged 54 years said that the diverticulitis he suffered did not affect his life, and 3 other patients aged 30-40 years said that the diverticulitis he suffered made him more stressed and anxious about his condition. his body in the future.

Diverticulitis occurs due to the digestion of food that moves very slowly through the large intestine. The pressure caused by food and feces on the large intestine can cause several points of the large intestine to become weak, resulting in small abscesses forming on the colon wall. Lifestyle influences the occurrence of diverticulitis, lack of exercise, smoking, obesity, lack of fiber intake, and high fat intake are risk factors for the occurrence of diverticulitis. Possibly less well-studied risk factors for diverticulosis include colonic dysmotility due to neurodegeneration and changes in colonic neuromuscular activity due to altered serotonin signaling. Complications of diverticular disease can consist of acute diverticulitis, abscess, fistula, intestinal obstruction, and perforation. Previous studies have shown that a diagnosis of diverticular disease is associated with an increased frequency of anxiety disorders and depression. Generalized Anxiety Disorder (GAD) is considered a common psychiatric diagnosis with a lifetime prevalence of 4.6% and 7.7% respectively in male and female patients aged 18-64 years (Kaye, Alexander J et al, 2023)

Management of patients with diverticulitis depends on its severity, presence of complications, and comorbid conditions. Therefore, there is no standard treatment for managing diverticular disease, including diverticulitis. Computed tomography (CT) imaging can confirm the diagnosis of diverticulitis and differentiate between the two disease processes. Management of uncomplicated diverticulitis is by using antibiotic drugs and lifestyle changes. The majority of diverticulitis can be treated on an outpatient basis. If diverticulitis is complicated by perforation, abscess, or bleeding, surgery is generally required, and this often causes anxiety in sufferers due to worry and uncertainty about post-operative conditions (Hawkins AT, et al, 2020).

The progressive muscle relaxation technique is one of the nursing actions that can reduce anxiety. Progressive muscle relaxation exercises aim to differentiate the feelings experienced when muscle groups are relaxed compared to when the muscles are tense. Progressive muscle relaxation can influence the hypothalamus to regulate and reduce the activity of the sympathetic nervous system (Kuswandi, 2013). Knowing the location and feeling tense muscles allows patients to feel the loss of tension as an anxiety response, whereas progressive muscle relaxation therapy can stimulate the release of endorphin and enkephalin chemicals and stimulate brain signals which cause muscles to relax and

increase blood flow to the brain. Progressive muscle relaxation can make the mind feel calm and relaxed, and it easier to sleep,

Progressive muscle relaxation therapy reduces signs and symptoms of anxiety and increases the ability of anxious clients to be treated. Progressive muscle relaxation is a specialist therapy that is highly recommended for reducing anxiety in clients with chronic illnesses because this therapy has a huge effect on reducing signs and symptoms in physiological aspects (Syisnawati et al, 2017). This scientific work will apply progressive muscle relaxation therapy to patients experiencing diverticulitis with anxiety nursing problems at Darmo Hospital, Surabaya.

METHODS

Study Design

The basis of the research used is a case study of providing nursing care using a nursing process approach.

Settings

A case study was conducted on one patient with anxiety using progressive muscle relaxation therapy techniques lasting 15-20 minutes for three days.

Research subject

The research was conducted at Darmo Hospital Surabaya on 23-25 September 2022 by applying progressive muscle relaxation therapy to 1 respondent for 3 days.

Instruments

The data collection tool for patients uses nursing care sheets using the Hamilton Rating Scale for Anxiety instrument (HARS).

Data collection

The data collected is from direct patient interviews, observation and physical examination, and documentation studies.

Data Analysis

After the data was collected, the researcher concluded the problem and determined the priority of the problem then made an action plan to be carried out on the patient by applying progressive muscle relaxation therapy techniques to patients who experienced diverticulitis with anxiety nursing problems.

Ethical Consideration

A statement that this research does not violate research ethics is proven by a certificate of ethics.

RESULTS

The results of this case study show a decrease in the level of anxiety felt by the patient after being given progressive muscle relaxation therapy. The level of anxiety decreased from moderate anxiety (score 22) to mild anxiety (score 14), the patient appeared calm and relaxed, and the patient's

pulse decreased. While promising, these results are based on a single case study, and the absence of statistical analysis means that the findings should be interpreted cautiously.

DISCUSSION

Based on the results of the assessment on 23-25 September 2022, it was discovered that Mr B was 28 years old with symptoms of difficulty defecating but also diarrhea. When he was at home the patient had diarrhea 3 times, the patient felt nauseous, and vomited, but this had subsided, the patient felt anxious and agitated with his health condition, and it is always difficult to sleep at night because he thinks about his illness, the patient also looks confused, the chest feels heavy for breathing but the patient is not short of breath. This is by the statement of Probert & Gaglia, 2015, that chronic diverticulosis can cause the intestines to become inflamed repeatedly. So, it can cause fibrosis and adhesion of surrounding structures and causes symptoms of obstipation, ribbon-like stools, intermittent diarrhea, abdominal stretching, and pericolonic abscesses which narrow the already narrowed lumen.

According to the Indonesian Nursing Diagnosis Standards (SDKI), anxiety is an emotional condition and subjective experience of individuals towards unclear and specific objects due to anticipation of danger which allows individuals to take action to face threats (IDDPP PPNI Working Group Team, 2017). According to the researchers' assumptions, the nursing assessment of Mr B was by theory, where in the assessment the objective and subjective data were obtained in accordance with theory in diverticulitis patients, namely that the patient experienced anxiety.

The nursing diagnosis for Mr. B was anxiety related to a threat to self-concept as evidenced by the patient feeling anxious and restless about his health condition, always having difficulty sleeping at night because he thought about his illness, the patient also appeared confused. The patient's general condition is weak, compos mentis consciousness, GCS 456, vital signs BP: 117/65 mmHg N: 118 x/minute S: 36°C RR: 19 x/minute SpO2: 99%. The patient's next nursing diagnosis was nausea related to gastric distension as evidenced by the patient complaining of feeling nauseous.

According to the PPNI IDHS (2017), there are six pre-op nursing diagnoses and four post-op nursing diagnoses in diverticulitis cases, namely 1) Nutritional deficit (D. 0019) related to decreased appetite as evidenced by body weight decreasing by at least 10% below the ideal range, feeling full quickly after eating, abdominal cramps/pain, decreased appetite, hyperactive bowel sounds. 2) Diarrhea (D.0020) associated with gastrointestinal inflammation characterized by abdominal pain, defecation of >3 liquid feces in 24 hours, 3) Constipation (D.0049) associated with decreased gastrointestinal motility as evidenced by the patient complaining of less than 2 defecation times a week, long and difficult stools, hard stools, decreased intestinal peristalsis, 4) Chronic pain (D.0078) which is related to nerve compression as evidenced by the patient complaining of pain, feeling depressed (pressured), the patient appears grimacing, restless, and unable to complete activities, 5) Anxiety (D.0080) is related to threats to self-concept as evidenced by the patient feeling confused, feeling worried about the consequences, and having difficulty concentrating, the patient appears restless, appears tense, and has difficulty

sleeping. 6) Nausea related to gastric distension as evidenced by the patient complaining of feeling nauseous.

Post op nursing diagnosis: 1) Acute pain (D.0077) related to a physiological injury agent (surgical procedure) as evidenced by the patient complaining of pain, appearing to grimace, being protective (e.g.: alert, position to avoid pain), restless, increased pulse rate, Difficulty sleeping, complaining of pain in the lower abdomen, looking grimaced, restless, increased pulse rate and difficulty sleeping, 2) Risk of infection (D.0142) proven by invasive procedures, 3) Risk of shock (D.0039) proven by lack of volume fluids, 4) Impaired physical mobility (D.0054) bd Pain as evidenced by complaints of difficulty in lifting extremities, decreased muscle strength, decreased range of motion ROM. According to the researcher's assumption, the nursing diagnosis for Mr. B follows theory, the diagnosis that has been established is in accordance with the theory explained, namely, Anxiety is related to threats to self-concept and nausea is related to gastric distension.

The outcomes of progressive muscle relaxation therapy, which incorporates non-pharmacological approaches, demonstrate its effectiveness in alleviating anxiety. This intervention is characterized by its relative ease, cost-effectiveness, safety, and overall enjoyment.

. Types of intervention in the form of therapy to overcome anxiety and stress using non-pharmacological techniques include progressive and autogenic muscle relaxation, music therapy, guided imagery, virtual reality, and mindfulness training (Hermanto et al., 2020). This is in accordance with SIKI (2018) that for patients who experience anxiety, the interventions given are to identify a quiet and comfortable place, Monitor regularly to ensure muscles are relaxed, Monitor for indicators of not relaxing (e.g. movement, heavy breathing), Arrange the environment so that there are no distractions during therapy,

Suggest tensing the muscles for 5 to 10 seconds, then recommend relaxing the muscles for 20-30 seconds, 8 to 16 times each. focus on the sensation of relaxed muscles, encourage breathing deeply and slowly, and Encourage practicing between regular sessions with the nurse. Before providing intervention to patients, an anxiety level assessment was carried out using HRS-A (Hamilton Rating Scale for Anxiety), which consists of 14 symptoms, namely feelings of anxiety, tension, fear, sleep disorders, intelligence disorders, feelings of depression, muscle symptoms, sensory symptoms, cardiovascular symptoms, respiratory symptoms, gastrointestinal symptoms, urogenital symptoms, autonomic symptoms, behavior. Goldfried and Davidson in Syarkawi, (2019) state that relaxing the muscles in relaxation can reduce tension and excessive anxiety.

According to researchers, the intervention administered to Mr. B adhered to theoretical principles, as it was aligned with the planned approach that integrated both pharmacological and non-pharmacological therapies concurrently.

Based on research conducted by Essa et al., (2017), it was proven that progressive muscle relaxation is effective for reducing stress and anxiety. Correspondingly, progressive muscle relaxation can also improve sleep quality and reduce fatigue (Amini et al., 2016). Considering that the impact of

anxiety on surgical/surgical patients can interfere with the implementation of surgery and anesthesia, it is necessary to take action to reduce anxiety. There are two ways to reduce anxiety, namely by pharmacological and non-pharmacological techniques (Ismoyowati et al., 2020). Pharmacological techniques are techniques that are carried out by administering drugs or medication. Drug therapy for anxiety disorders is classified into antianxiety which consists of anxiolytics. Minor tranquillizer, sedative, hypnotic and anticonvulsant (Donsu et al., 2015).

Non-pharmacological therapy to reduce anxiety is an easier, cheaper, safer, and more enjoyable intervention. Types of intervention in the form of therapy to overcome anxiety and stress using non-pharmacological techniques include progressive and autogenic muscle relaxation, music therapy, guided imagery, virtual reality, and mindfulness training (Hermanto et al., 2020). According to the researchers, the implementation carried out was in accordance with theory, namely by reducing anxiety with progressive muscle relaxation techniques.

The application of progressive muscle relaxation therapy for three days in diverticulitis patients with anxiety nursing problems is known to result in a decrease in the level of anxiety suffered by the patient. Providing progressive muscle relaxation therapy with the amount of time to carry out progressive muscle reaction therapy, namely 15-20 minutes. This is proven by the results where when the assessment was carried out the patient complained of anxiety where the anxiety level was moderate, then after taking action the application of progressive muscle relaxation therapy reduced the anxiety level from four to two.

During implementation, patients are given therapy according to the intervention, namely progressive muscle relaxation therapy. Before implementing progressive muscle relaxation therapy, researchers gave it for three days with a duration of fifteen to twenty minutes each day. Starting with preparing an informed consent sheet, then making a contract for the time, and place and explaining the purpose of providing progressive muscle relaxation training therapy and also environmental preparation such as creating a comfortable environment for the patient. Assess the patient's response, and provide progressive muscle relaxation therapy to the patient directly to the patient. Give progressive muscle relaxation therapy to the patient. After that, the researcher asks the patient to rest for about 30-35 minutes, then the researcher reviews anxiety.

The application of progressive muscle relaxation therapy provided by researchers can help solve problems caused by diverticulitis. Respondents said they were grateful for the presence of researchers. When administering progressive muscle relaxation therapy, patients were able to follow the researchers' instructions well. The patient appears more comfortable and relaxed and becomes more open. Apart from that, environmental preparation such as keeping the atmosphere quiet so that the patient only focuses on the progressive muscle relaxation therapy given by the researcher, thus the patient appears to enjoy and feel relaxed.

Progressive muscle relaxation is based on the working mechanism of influencing the need for sleep, where a relaxation response (Trophotropic) occurs which stimulates all functions where it works

in opposition to the sympathetic nervous system so that a relaxed and calm state is achieved (Wulandari et al., 2015). Progressive relaxation techniques can be used to reduce anxiety, because they can suppress the sympathetic nerves thereby reducing the feeling of tension experienced by the individual reciprocally, resulting in counter-conditioning (elimination).

The parasympathetic nervous system controls activities that occur during calming of the body, for example decreasing heart rate after a tension phase and increasing blood flow to the gastrointestinal system so that anxiety will be reduced by progressive relaxation (Handayani & Rahmayati, 2018). Research conducted by Chellew et al., (2015) proved that cortisol levels seen through respondents' saliva samples experienced a significant decrease after being given Progressive Muscle Relaxation.

Relaxation was created after studying the human nervous system, which consists of the central nervous system and the autonomic nervous system. The autonomic nervous system consists of two subsystems, namely the sympathetic nervous system and the parasympathetic nervous system whose work is opposite to each other. The sympathetic nervous system is more active when the body needs energy, for example when shocked, afraid, anxious, or in a tense state. In conditions like this, the nervous system will stimulate blood flow to the skeletal muscles, increase heart rate, blood sugar levels, and tension causing the muscle fibers to contract, contract, and contract. Instead, muscle relaxation goes hand in hand with the autonomic response of the parasympathetic nerves.

In accordance with the journal that is the researcher's reference entitled "Progressive muscle relaxation therapy for anxiety clients" by Zaini in The Indonesian Journal of Health Science, vol. 8, no. 2, June 2019 where 34 respondents were given progressive muscle relaxation therapy which showed results where the social symptoms that most often occurred before being given nursing and supportive therapy were difficulty enjoying daily activities for 6 clients with an average of 0.8 out of 3 social signs. After being given supportive nursing and therapy measures, 5 clients showed signs of difficulty enjoying daily activities with an average of 0.4 out of 3 social symptoms.

According to the study titled "The Effect of Progressive Muscle Relaxation Techniques on Anxiety in Preoperative Patients," published in the Sai Betik Nursing Journal by Tori Rihiantoro et al. (2018), the results indicate that the average anxiety score before the progressive muscle relaxation therapy was 54.17 with a standard deviation of 5.427. After the therapy, the average anxiety score decreased to 50.33, with a standard deviation of 4.999. Analysis using the Wilcoxon test yielded a p-value of 0.000 (p-value $< \alpha = 0.05$), which indicates a statistically significant effect of progressive muscle relaxation therapy on reducing anxiety levels in preoperative patients.

In the Journal of the American College of Surgeons by Mariam N. Hantouli MD, et al: 2021 entitled "Patient- vs Surgeon reported Indications for Elective Colectomy for Diverticulitis" the paired t-test results were obtained with a value of 0.000 ($p < 0.05$). This shows the influence of progressive muscle relaxation on preoperative anxiety levels at Santa Elisabeth Hospital Medan in 2018. This was also found in one of the case studies which was also used as a reference by researchers, namely in the Scientific Journal of Nursing by Sunaryo Joko Waluyo, Saka Suminar (2018) where the anxiety score

before being given therapy was patient 1: 27 and patient 2: 26, after progressive muscle relaxation therapy, was carried out 1x/day during the day, the anxiety score became 14 for both patient 1 and patient 2, the anxiety level decreased.

According to the researchers' assumptions, the analysis of the application of the progressive muscle relaxation technique studied is by the theory. The progressive muscle relaxation technique provided can overcome and overcome anxiety nursing problems in diverticulitis patients. Progressive muscle relaxation techniques can gradually control and minimize the anxiety suffered by patients.

LIMITATION

No limitation.

CONCLUSION

After implementing progressive muscle relaxation therapy using HARS for three days, it showed a decrease in anxiety levels, where the first day before the treatment was carried out Mr B's anxiety level was moderate anxiety, and after carrying out progressive muscle relaxation therapy for 15-20 minutes every day for three days, the anxiety level decreased from moderate anxiety to mild anxiety, the patient appeared calm and relaxed, the patient's pulse decreased. Suggestion: It is hoped that workers must always work together with other health teams in providing optimal nursing care, especially for diverticulitis patients who experience anxiety. Future research should explore the long-term effects of progressive muscle relaxation therapy in a more diverse patient population and consider comparing its efficacy with other anxiety management strategies.

AUTHOR CONTRIBUTION

Authors' contributions: All the authors contributed equally to the study.

ORCHID

Dian Rahmawati Agustin : None.
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CONFLICT OF INTEREST

None.

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REFERENCE

Andinna Dwi & Imelda Rahmayunia. (2018). Terapi Komplementer Guna Menurunkan ansietas Pasien Divertikulitis: Literatur Review. Vol.1 No.3.

Amin Huda N, Hardhi Kusuma. (2015). NANDA NIC-NOC Aplikasi Asuhan Keperawatan Berdasarkan Diagnosa Medis. Jilid 2. Yogyakarta: Medication.

Ardiansyah, M. (2012). Medikal Bedah. Yogyakarta: DIVA Press.

Arikah & Muniroh, L. (2015). Riwayat Makanan yang Meningkatkan Asam Lambung sebagai Faktor Risiko Divertikulitis. Gizi Indon, 38 (1), 9-20.

Access, O., Erni, N., Zainal, A. M., Titah, N. A., Blora, D. K., & Semarang, P. K. (2020). Jurnal Studi Keperawatan Pengaruh Teknik Relaksasi Terhadap Penurunan Nyeri Epigastrium Pada Pasien Divertikulitis Pendahuluan Metode Penelitian Hasil dan Pembahasan.

Black, J.M & Hawks, J.H (2014). Keperawatan Medikal Bedah : Manajemen Klinis untuk hasil yang diharapkan. Edisi 8. Jakarta : Salemba Medika.

Dermawan Deden, Rahayuningsih Tutik. (2010). Keperawatan Medikal Bedah (Sistem Pencernaan). Yogyakarta: Gosyen Publishing.

Dinkes Jatim. (2018). Profile Kesehatan Provinsi Jawa Timur Tahun 2017. Surabaya: Dinas Kesehatan Provinsi Jawa Timur.

Ida, M. (2016). Asuhan Keperawatan Pada Pasien dengan Gangguan Sistem Pencernaan. Jakarta: Pustaka Baru Press. International Review of Immunology, 66(1), 1-15. https://doi.org/10.3109/08830185.2014.902452.

'Irianty, H., Hayati, R., & Suryanto, D. (2020). Kejadian Divertikulitis Berdasarkan Aspek Promosi Kesehatan Dan Pola Makan Article history: in revised form 23 Juni 2020 Universitas Muslim Indonesia Accepted 26 Juni 2020 Address: Available Email: Phone: tahun 2017 jumlah penderita divertikulitis di seluruh rumah sakit di Kalimantan Selatan sebanyak 700. 3(3), 251–258.

Kementrian Kesehatan RI. (2016). Pusat Data dan Informasi Kementrian Kesehatan RI Situasi Remaja. Jakarta Selatan.

Kozier, B., Erb, Berman, Snyder. (2012). Buku Ajar Fundamental Keperawatan: Konsep, Proses, dan Praktik (Pamilih, E,K., Devi, Y., Yuyun, Y., Y., Ana, L., & Wilda, E., Penerjemah) Ed. 7, Vol 1. Jakarta: EGC.

Mitachul Safi'i, Samiyanto & Yeni Surya. (2019). Pengaruh Teknik Relaksasi Otot Progresif Terhadap Penurunan Nyeri Perut Pasien Gatrointertitis Akut Di IGD RS Bina Sehat Jember.

Mubarak, I. Indrawati, L. and Susanto, J. (2015) Buku Ajar Ilmu Keperawatan Dasar. 2nd ed. Jakarta: Salemba Medika.

Muttaqin, Arif & Sari, Kurmala. (2011). Gangguan Gastrointestinal: Aplikasi Asuhan Keperawatan Medikal Bedah. Jakarta: Salemba Medika.

Nursalam. (2013). Metodologi Penelitian Ilmu Keperawatan (13.ed). Jakarta: Salemba Medika.

Puspariny, C., Fellyana, D., & Marini, D. (2019). Pengaruh Teknik Relaksasi Otot Progresif Terhadap Intensitas Nyeri Pasien Divertikulitis di Puskesmas Antar Brak Kecamatan Limau Kabupaten Tanggamus Effect of Breath Relaxation Techniques in Pain Intensity in Gastritical Patients in Health Center Between Brake District Brake Tanggamus District. 62–66.

Rukmana, L. I. A. N. (2018). Faktor-faktor yang mempengaruhi kekambuhan divertikulitis di SMAN 1 Ngaglik.

Smeltzer, SC & Bare, B.G . (2013). Buku Ajar Keperawatan Medikal Bedah Brunner & Suddarth, edisi 8. Jakarta: EGC.

Sunaryo Joko Waluyo & Saka Suminar. (2018). Pengaruh Teknik Relaksasi Otot progresif Terhadap Perubahan Skala Nyeri Sedang Pada Pasien Divertikulitis Di Klinik Mboga Sukoharjo. Vol.6 No 1.: Jurnal Keperawatan Intan Husada.

Syaifuddin. (2010). Anatomi fisiologi kurikulum berbasis kompetensi untuk keperawatan dan kebidanan. Ed 4. Jakarta: EGC.

Teknik, P., Nafas, R., Terhadap, D., Malang, J. K., Program, M., Ilmu, S., … Malang, T. (2016). 1), 2), 3) 1). 1, 53–62.

Thahir, N. (2018). Pengaruh relaksasi napas dalam terhadap penurunan intensitas nyeri pada pasien divertikulitis di ruang rawat inap. 2(2), 129–134.

Tim Pokja SDKI DPP PPNI, (2017). Standar Diagnosis Keperawatan Indonesia, Jakarta Selatan: Dewan Pengurus Pusat.

TimPokja SIKI DPP PPNI, (2017). Standar Intervensi Keperawatan Indonesia, Jakarta Selatan: Dewan Pengurus Pusat.

Tim Pokja SLKI DPP PPNI, (2017). Standar Luaran Keperawatan Indonesia, Jakarta Selatan: Dewan Pengurus Pusat.