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Effectiveness of Early Ambulation Education in Pre Operative Stage to Reduces Complication Risk After Total Knee Replacement: A case study

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ABSTRACT

Osteoarthritis is one of the degenerative health problems in urban areas that attack many older people. One of the treatments of osteoarthritis is surgery to replace the damaged joint. The phenomenon occurred on many patients after the surgery for joint replacement is the lack of knowledge of the patients about the importance of early post-surgical ambulation. This paper is a case study to analyze the effectiveness of early ambulation in the preoperative stage on the patients after total knee replacement at one of the Public Hospitals in Jakarta. The third day after surgery, there was no complaint of dizziness and feeling faint. Dangling position exercises are carried out for ± 5 minutes by moving the legs around the bed. Passive and active ROM is still done. The results of pre and post-exercise neurovascular evaluation (blood pressure and heart rate) showed that indicators are still within normal limits. Educating patients in the pre-operative stage of early ambulation is proven to be effective in reducing postoperative complications.

Keywords: early ambulation, osteoarthritis, total knee replacement.

1. INTRODUCTION

One health phenomenon that often arises in urban communities, especially for the elderly, is an inflammatory disease of the bones and joints (osteoarthritis/OA). Along with increasing age, the incidence of osteoarthritis (OA) is also growing. OA has become a musculoskeletal disease that often attacks older people in the 21st century. The prevalence of OA in Indonesia in general reaches 30.3%; where the incidence in patients with a 45-54 years old range is 46.3%; 55-64 years old range is 56.4%; 65-74

years old range is 62.9%, and above 75 years old is 65.4% (1). Whereas, according to (2), the prevalence of OA in Indonesia reaches 5% at the age of < 40 years old, 30% at the age of 40 - 60 years old, and 65% at the age of > 61 years old.

Osteoarthritis (OA), also known as degenerative arthritis, hypertrophy arthritis, or age-related arthritis. Osteoarthritis (OA) is a degenerative joint disease, in which the entire structure of the joint undergoes pathological changes. This disease is characterized by damage to cartilage hyalin joints, increased thickness and sclerosis of the bone plate, growth of osteophytes at the edges of joints, stretching of joint capsules, inflammation, and weakening of muscles connecting joints (2).

OA is the most common joint disease in adults in the world. In three adults has radiological signs of OA (3). OA on the knee is the most common type of OA in adults. A study by (4) found that adults with a 60-64 year age group were 22%. In men with the same age group, 23% had OA in the right knee, while the remaining 16.3% had OA on their left knee. Unlike the case in women who are evenly distributed, with the incidence of OA in the right knee as much as 24.2% and 24.7% in the left knee.

The treatment for OA can be done surgically or without surgery. However, the treatment of end-stage knee OA often requires surgery to eliminate the pain on the knees. Total Knee Replacement (TKR) is one of the actions considered better than conservative treatment, arthroscopic debridement or High Tibial Osteotomy (HTO). Total Knee Replacement (TKR), aside to relieving knee pain optimally can also maintain the movement of the knee joint from 0 to 115 degrees.

On the Post-surgery, there is a tendency where the patients are often afraid to start moving their limbs, especially the area being operated on. Long-term immobilization conditions will stimulate skeletal muscle atrophy, especially the lower extremities. Muscle strength will decrease by 1-1.5% per day during the immobilization period and reach 5.5% per day if immobilization is because of the placement of casts, drains, or fractures. According to (5), after ten days the muscles are not given a load or bed rest, so the results in the first four days will decrease muscle strength to hold the load, and after six weeks the bed rest, almost half of muscle strength will decrease.

High immobilization conditions have an impact on the length of stay (6). In theory, the patients after orthopedic surgery might conduct early mobilization several hours until one day after surgery (7). The length of care days at the hospital has an impact on the patient's financial problems, because the longer it is treated, the higher the costs needed. Also, the opportunity for other patients to be treated at the hospital will be reduced because the turnover of patients that takes too long.

One of the treatments to reduce the complications after the replacement of the knee joints is early ambulation, which is a nursing action that starts from sitting on the edge of the bed, standing and walking with tools/crutch assistance (8). The benefits of the implementing early ambulation in post orthopedic surgery patients include the increasing patients turnover per bed in each month as well as decreasing morbidity and mortality after surgery compared to the use of post-TKR operational standards beforehand (9). The patient's preparation before surgery dramatically influences the patient's ability to carry out premature ambulation after surgery.

Nurses as professional health workers, who are almost 24 hours apart from patients, to carry out their roles both as direct clinical practice, e.g., to provide direct services to the patients based on the sciences, experiences, and evidence-based practices. In addition, nurses who act as the expert coaching and guidance should help

nurses implement the new evidence-based practice in nursing practice, explicitly facilitating the provision of health education to the patients (Health Promotion) or teaching the patients how to achieve optimal health status (10).

2. OBJECTIVE

To analyze the effectiveness of early ambulation in the preoperative stage on the patients after total knee replacement at one of the Public Hospitals in Jakarta

3. METHOD

This scientific paper is a case study method for patients with Osteoarthritis Genue Dextra. The data collection techniques used include interviews, observation, individual records, medical records, and treatments. Data that has been collected is analyzed to see the nursing problems experienced by the patients and review the effectiveness of the interventions that have been done to solve patients' nursing problems, especially pain problems.

4. RESULT

Case Overview

The patient is a 54-year-old woman, a Sundanese, and Muslim. The patient was registered through Persahabatan Orthopedic Police General Hospital and are planned to undergo surgery for the Total Knee Replacement for an indication of OA Genue Dextra. In March 2013, the patient felt because of the slippery, and her knees were supporting her weight. Since then, the patient has begun to feel pain in both knees, accompanied by a stiff sensation in the morning. The patient said that both knees, especially the right knee, began to swell and increasingly difficult to move. The patient finds it difficult to get along during the prayers and had experiences limitations in carrying out daily household activities such as washing clothes and mopping the floor. To deal with her complaint, the patient only tried to smear his knees with eucalyptus or balsam oil to cause a warm sensation on both painful knees.

The patient has a history of asthma since her childhood and hypertension for ten years with the routine treatment of Amlodipine 10 mg. The Patient has been treated with a medical diagnosis Congestive Heart Failure Functional Class (CHF FC) 1, Anteroseptal Ischemia, and CAP dd/pulmonary tuberculosis. The patient said that TB treatment had completed for six months in 2013.

Nursing Management

Post-surgical nursing problems that arise based on the results of the study through history taking, physical examination, and medical examination, include pain (acute), a high risk of decreased perfusion of peripheral tissue and a high risk of damage to skin integrity.

a. Acute Pain

Based on the results of the study, it is obtained the data related to the subjective complaints of the patients who say that there is pain around the operating area (right knee), the scale of the pain 5-6 includes the pain spreads from the knee to the right calf. The pain appears when the foot is moved for 5 minutes, and the frequency is about three times a day. Objectively the patient seems to wrinkle her face while holding back pain and to be careful at making moves.

b. The risk for Ineffective Peripheral Tissue Perfusion

The risk is indicated by the data on the complaints from the patient who is afraid that the suture wound will be open if she moves a lot. Observation: the patients seem to wrinkle her face while holding back the pain and to be careful at making moves, the right foot is not pale, CRT < 3 seconds, installed a 600 cc/24 hour production vacuum drain, postoperative wound wrapped in elastic bandages, and no erythema; while being palpated the patient does not feel any tenderness, the right and left dorsal pedis artery pulses feel equally strong, and there is no muscle spasm; during assessing muscle strength there is no plegi and paresthesia, grade 4 leg muscle strength, Ankle Brachial Index (ABI) 1.3 and Range Of Motion (ROM):

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c. The risk for Impaired Skin Integrity

The damaging problem to skin integrity is considered risky based on the patient's complaint data about the itching and the heat around the operating area and a back core because of the bed rest. Through the observations, it is obtained the data on the presence of erythema in the back of the patient because of the complete bed rest up to 8 hours after spinal anesthesia. The surgical wound in the patient's right knee is covered with elastic bandages.

The primary nursing problem, in this case, is a high risk of decreased peripheral tissue perfusion. Nursing actions that have been taken to overcome the nursing problems include: changing the position of patient on the bed each shift and assisting the patient during the mobilization, providing motivation to patient to carry out early ambulation after surgery, reviewing the patient's lower extremities from signs of erythema and Homan sign , remind the patient not to cross her legs or sit with her legs depending on their length, carefully monitor the patient's vital signs (blood pressure and pulse frequency), peripheral arterial pulses, skin color, temperature, capillary filling, drainage production, and the urine of the patient in each shift, and help range motion exercises including active foot and knee exercises and the use of walking aids.

Based on the evaluation of nursing actions that have been made obtained the following results:

a. Acute Pain

Nursing problems in severe pain are entirely resolved on the third day after surgery, where the patient is allowed to choose the preferred distraction technique to relieve the pain that is felt around the operating area. The patient chose pain distraction techniques using *dhikr* because they are considered easy to do and

subjectively the patient feels much calmer each time he makes *dhikr*. Through modification of all three relaxation techniques (deep breathing, progressive muscle relaxation, and distraction), the patient reported a significant reduction in the scale of pain on a scale of 0-1. Subjective data is supported by standard hemodynamic range data, both blood pressure, and pulse, as well as nonverbal responses of the patient who no seemed to wrinkle her faces and grimace in pain. Thus through nursing actions that have been given for 3 x 24 hours, acute pain in the patient after TKR surgery is resolved.

b. The risk for Ineffective Peripheral Tissue Perfusion

The focus of nursing action for this nursing problem is to help the patient to carry out early ambulation after surgery immediately. Patients and families are educated about the importance of early post-surgical ambulation to avoid post-surgical complications such as venous stasis and contractures. The condition of the patient's lower extremities is assessed daily, including look (there is no erythema and pallor, capillary filling time, and production of vacuum drain); feel (presence or absence of tenderness and muscle spasm and strength of the right and left leg dorsal pedis artery pulsations); power (the presence or absence of pledge and paraesthesia, muscle strength especially the right leg and the presence or absence of signs that lead to the risk of Deep Vein Thrombosis (DVT), namely Homan sign); and Move (ability of flexing the joints of the feet and the range of movement of the patient's joint).

The result of this nursing action is that the patient and family understand the importance of early ambulation after surgery, such dangling position and standing balance. The psychomotor response observed is that the family has an active role in assisting and motivating the patient to do early ambulation. The condition of the patient's lower extremities includes reviewing the look, feel, power and move within the normal limits so that it can be concluded at the end of nursing care that the risk of a decrease in peripheral tissue perfusion as a result of postoperative immobilization does not occur in this patient.

c. The risk for Impaired Skin Integrity

The patient complains of discomfort in the skin around the surgical area that is covered with elastic bandages. Patient's report shows no history of allergies of food, medicine, and clothing supporting preventive measures such as elastic bandages or plaster. The inconvenience felt by the patient is in the form of the complaints of heat and itching around the skin covered in elastic bandages. The position of the patient who is required to have bed rest for 6-8 hours after spinal anesthesia causes discomfort in the patient's back.

Nursing actions on the first day focused on the active family participation to prevent the occurrence of pressure sores on the back and other stressed areas by routinely replacing diapers at least 2 to 3 times a day, immediately changing patient's linen when they're wet or dirty and changing patient sleeping positions to a minimum every 2 hours. Families are also taught how to massage the patient's back by using coconut oil. The education to patient and families is also given to increase the intake of specific nutrients which are based on high protein ingredients such as meat, eggs, tofu, and *tempeh* to accelerate the wound healing process.

The replacement of surgical wound dressing in the patient's right knee is performed by using NaCl 0.9% as a physiological fluid and sterile gauze. The results obtained from the surgical wound replacement procedure included: 7.5 cm of a surgery over the patient's right knee that was dry, no bleeding, patent surgical suture, and no pus was found.

The patient is reminded to consume a lot of high-protein nutrition and is motivated to sit up a lot to prevent too deep pressure in the back area. The patient is encouraged to take care of herself by bathing, changing clothes, and dressing. The results of implementing these nursing actions for three days include: patient's report shows some complaints of heat and soreness in the back are reduced after the back massages. The integrity of the skin on the back and around the buttocks of the patient is in good condition, dry, no blisters, and free of erythema. Thus, at the end of the nursing care, it can be concluded that the risk of the damage to skin integrity due to long bed rest does not occur in this patient.

5. DISCUSSION

Nowadays, there are two social determinants of health that occurred in urban communities: infectious and non-infectious diseases. OA is a type of degenerative non-communicable disease because of most cases of OA attack elderly patients. This disease attacks people throughout the world, including Indonesia.

The context of public sphere presented with the data related to the stress on individuals can be triggered by the following factors, e.g., economic factors, the increasing workload, dense living environment, or environmental pollution. The high workload and competition in the city require urban communities to race against time. Thus there is a cultural shift in urban society which tends to offer fast-paced facilities to meet all necessities of life, for example, in terms of food consumption.

Fast food is one of the characteristics of a cultural shift adopted from the western world. In addition, along with technological advancements, the city offers recreational services for urban communities without having to travel outside the home through communication devices in the form of smartphones. Addiction to online games or social networking has implications for the low motivation of urban people to do physical activities on holidays or in their free time.

Departing from this phenomenon, it is inevitable that the pattern of fast food consumption and game addiction contributes to the increase in the number of individuals complaints of obesity in urban communities. Obesity itself is one of the factors for OA at a young age, although, in theory, OA is a degenerative musculoskeletal disease. In this scientific essay, the case that will be discussed is the application of urban public health clinic practices to patients with a specific OA genuine that will undergo total knee joint surgery.

Based on the results of the study, it obtained the data about the patient who had experienced physical trauma from slipping with her body position resting on both knees in March 2013. In addition, from the patient's anthropometric data, with a height of about 160 cm and weighing 85 kg, the BMI calculation was obtained for about 33.2 kg/m2 which is included in the obese class 1 classification. The likelihood of OA occurring in one knee of an obese patient is five times higher than that of the nonobese patient. This fact concludes that obesity is a risk factor for OA, especially in the knee

joint. The patient herself is a housewife who is used to do housework on her own. One of the housework that is often done by the patient who is at risk of increasing joint burdens on both knees is washing clothes and mopping the floor in a squatting position.

The patient is currently 54 years old. This is in accordance with the theory and previous studies on OA which stated that the prevalence of OA in Indonesia, in general, reached 30.3%; with the prevalence of patients in the age 45-54 is 46.3%; age 55-64 is 56.4%; age 65-74 is 62.9%; and above 75 years old is 65.4% (1). Meanwhile, according to (2), the prevalence of OA in Indonesia reaches 5% at the age of < 40 years old, 30% at the age of 40 - 60, and 65% at the age of > 61 years old.

This case shows that the patient is a woman. According to (11), OA is more common in women than in men. Research in Norway also indicates that the comparison of the prevalence of OA in Norway is 14.7% in women and 10.5% in men (12). While the incidence of radiological OA knee in Indonesia reaches 15.5% in men and 12.7% in women (13). At the age of younger than 45 years old, the incidence of OA in men is higher than that of women (14).

Women are more likely to suffer from OA than men because hormonal regulation in a woman's body tends to fluctuate potentially inhibiting the absorption of calcium in the blood. Calcium plays a vital role in the process of bone formation. Furthermore, in this case, the patient has not yet menopause even though she is 54 years old. Women and menopause are an entity in the body's natural processes. This process is unavoidable because each woman will experience menopause at different ages. In general, the period of women entering menopause is the age of 45-55 years. Menopause is a period in which the estrogen hormone decreases, and women stop having menstruation.

The reduction of estrogen causes various discomforts, such as heat fluctuations, insomnia, palpitations, dry vagina, decreased libido, and others. The long-term impact causes osteoporosis. Estrogen plays a vital role in helping the absorption of calcium in the body. Bone density drops by 3% after 12 months of non-menstruation. Decreased bone density due to osteoporosis contributes to the high incidence of OA.

Diagnosis criteria of knee OA are based on the (15), with the existence of knee pain, in the x-rays found a description of osteophytes, the patient is > 50 years old, complaints of joint stiffness in the morning < 30 minutes and presence of crepitus. Pain in the joint is usually the chief complaint that makes the patient visit the doctor. The pain often increases during the movement and decreases while taking rest. Generally, OA patients say that their complaints have been going on for a long time but are developing slowly.

This is by the clinical complaints encountered in this case where the patient came to the hospital with her compliances of knee pain for six months. The pain also does not disappear after the patient's knee is compressed. The pain became more severe when the patient folded her knees and moved her legs, but the pain is slightly reduced during the rest.

The predilection area of OA usually affects the joints of the body, such as the knee. In addition, it can also occur in carpometacarpal I, metatarsophalangeal I, apophyseal bones of the spine and thighs (14). This is following the clinical picture of the patient, which under the results of the genuine bilateral photo on December 31, 2013, which obtained the impression of a picture of bilateral OA.

Others OA patients also complain of the appearance of joint stiffness, which can arise after immobilization such as after sitting in a chair or car for quite a long time or even after waking up. Usually, this stiff joint lasts less than 30 minutes. These patients also feel the stiffness in their knee joint for the last three months, where the stiffness usually appears in the morning after the patients wake up and settle for about half an hour. When the rigidity of this joint appears, the patients cannot move their legs at all and can only stay in bed. If the lower extremity is moved by someone else, then the legs can only shift to the right or left.

Patients with OA experience barriers to joint motion and the presence of rattling that can sometimes be heard when the joint is moved. The patient, in this case, also complained that it was difficult to move and walk because of the pain. The patient also claims sometimes to feel like something is broken or broken when her knee is moved. In addition, the patient complained of swelling on both knees, which can also be found in other OA patients.

The patient reveals a change in gait, where the patient goes by dragging both feet. This symptom is a symptom that makes it difficult for the patient and is a significant threat to the independence of OA patients, especially in elderly patients. This situation is always associated with pain because it becomes the foundation of weight, especially in knee OA.

Based on the results of the physical examination, OA patients found that there were obstacles to joint motion both actively and passively. In addition, there is usually the presence of crepitus, which is increasingly evident with increasing weight. This symptom is caused by the friction between the two joint surfaces when the joint is moved or passively manipulated.

In this case, there is a crepitation on both knees when it passively moved. In addition, there are also obstacles to active motion in the joints of both knees; the patient is only able to reflect her knee only for 40-45° only, so only if it is moved passively. Based on the results of local examinations in the patient's joints, it was also found swelling and the presence of signs of inflammation such as joint pain, redness, and warmth on both knees. All of these signs correspond to the signs on the OA patient where swelling occurs due to the presence of fluid effusions and the presence of osteophytes on the joint surface.

Furthermore, in this case, at the preoperative stage, the patient expresses her anxiety during the surgery. This is caused by a lack of information obtained by the patient before the surgery, and there is no experience of undergoing previous surgery. When doing the initial assessment, the patient seems nervous and answers questions hesitantly and briefly. The patient expresses her fear of not being able to walk and returning to normal activities after undergoing surgery. This is because the patient does not understand the purpose and preparation of medicine that should be undertaken to minimize the risks and complications of the operation that she will undergo.

The high risk of decreasing peripheral tissue perfusion is one of the nursing problems that must be focused on every patient who undergoes orthopedic surgery. The immobilization procedure 6-8 hours after surgery to avoid the side effects of spinal anesthesia without coupled with adequate surgical preparation related to motion exercises and early post-surgical ambulation education will increase the risk of venous stasis and thromboembolism. The fear of mobilizing is often caused by post-surgical pain that will still be felt around the operating area.

It is thus essential for nurses to equip the patients with sufficient information at the stage of operating preparation regarding crucial things that should be done by postoperative the patients to reduce the risk of further complications of the surgery, including exercise and early ambulation. Next, the condition of the patient who is expected to be in a lie-down position for only 6-8 hours after spinal anesthesia will increase the risk of damage to the integrity of the skin, if the patient does not immediately carry out early ambulation after surgery. This is evidenced by the complaints of patients who feel discomfort in some areas of the body that are suppressed due to bed rest like a sore and hot back.

Three essential elements form the basis of the formation of compressive wounds: the intensity of pressure and pressure that closes the capillary, the duration and magnitude of the force, and tissue tolerance. Press wounds occur as a result of the relationship between time and pressure (16). The higher the strength and duration, the greater the incidence of wound formation. Skin and subcutaneous tissue can tolerate some pressure, but an enormous external pressure will reduce or eliminate blood flow into the surrounding tissue.

Tissues that experience this suppression become hypoxic resulting in ischemic injury. If the pressure is greater than 32 mmHg and is not immediately removed from the place that has hypoxia, the blood vessels will collapse so thrombosis is formed (blood clots occur). If the pressure is removed before the crisis point, the circulation in the tissue will recover through the physiological mechanism of reactive hyperemia. The skin has a more exceptional ability to tolerate ischemia than muscle so that compressive wounds will begin in the bone with muscle ischemia due to suppression, which eventually widens to the epidermis.

One of the nursing problems occurred to the patients with post orthopedic surgery is the high risk of decreased peripheral tissue perfusion as the result of immobilization. A compared two groups of patients after orthopedic surgery, in which in the control group where the patients were not preoperative exercise training intervention and in the intervention group where the patients were given motion training before facing surgery (5). Based on the results of these studies it was found that there was a difference in the average ability of early ambulation which was better in the intervention group compared to the control group ($p = 0.017$).

In theory, this happens because muscle strength training can prevent atrophy in the muscles, increase venous return, and maintain muscle strength in large muscle groups called quadriceps and gluteal muscles (7). In addition, the energy for carrying out activities is maintained, so that the patients have a better ability to ambulate on the 4th day after surgery.

This is following the opinion expressed by (17) who said that someone with a disability must be trained to do activities so they would not become too dependent and more independent in carrying out activities during the rehabilitation. According to (18), the factors that influence the implementation of early ambulation after orthopedic surgery are mental status, preoperative mobilization, patient's health conditions, and social support.

This statement is also supported by (7) who stated that early ambulation is determined by the level of the patient's physical activity, the stability of the cardiovascular and neuromuscular systems. One of the physical activities performed by the patients, who can avoid the risk of muscle atrophy, is by exercising both isometric

and isotonic muscle strength. Exercise programs can improve function and shorten the length of hospital stay (hospital stay) without further complications or dissatisfaction (19). The impact of muscle strength training before surgery is to improve the ability of early post-operative patient ambulation.

Early ambulation is a crucial component in postoperative fracture care because if the patients limit their movements in the bed and do not do ambulation at all, the patient will find it increasingly difficult to begin walking exercises (20). According to (21), ambulation is a walking activity. Ambulation supports joint strength, durability, and flexibility. Other benefits of training slowly can increase activity tolerance (20).

The advantage of providing education in the preoperative phase, in this case, is that the patient becomes more ready to undergo surgery and will not be too awkward to do post-surgical muscle and joint strength training. The training can be carried out by the patient independently by being supervised and assisted by the family without having to wait for the medical rehabilitation team. Provision of correct education at the stage of operating preparation also helps increase the active participation of the patients and families to support the achievement of the objectives of nursing interventions.

One of the obstacles encountered in the application of nursing actions in the field is the pre-operative preparation procedure, especially for orthopedic surgery, which still does not maximize muscle and joint motion exercises as one of the critical surgical preparations. Most of the patients who are treated are even not exposed to information about the actions that must be taken to prepare for surgery, which if done correctly at the beginning of the surgery preparation will minimize the risk of postoperative complications.

When the initial assessment was carried out in this case, a muscle movement exercise was performed for surgical preparation. The first day after surgery, the patient seemed afraid to do early ambulation because the production drain reached 600 cc/24 hours. The patient considers production drain very much as a result of the mobilization carried out after surgery. In addition, postoperative motion exercises that are the responsibility of the Medical Rehabilitation section can only come to accompany the patient to practice motion on the fourth day after surgery. Thus, new patients undergo motion exercises using a tool on the fourth day after surgery that is not by the theory of early post-surgical ambulation.

Some solutions that can be offered for room nurses are aimed at minimizing the risk of further complications after orthopedic surgery, which is to make the most of operating preparation time to train the patient's muscle movements. It can be situational anticipation if the health personnel responsible for postoperative motion exercises cannot be present to accompany the patient on H +1 action. The use of media such as leaflets or posters about muscle training and joint movements and the benefits of early post-surgical ambulation in each patient's room can also be an alternative problem-solving. Through maximum operational preparation, it is expected that the patient, without having to wait for assistance from health workers, has been able to do simple muscle exercises independently.

6. CONCLUSION

One of the degenerative musculoskeletal diseases that often occur in urban areas is OA with the main clinical manifestations that the patients often complain about with OA is severe joint pain. To deal with patient complaints due to OA, surgical measures to replace damaged joints are the most frequently chosen alternative. While the complications that must be avoided after orthopedic surgery are the occurrence of venous stasis and the risk of thromboembolism due to bed rest. Early post-surgical ambulation is a crucial nursing intervention that aims to minimize the risk of further complications from orthopedic surgery and can be taught and informed to the patients at the preparation stage by practicing muscle motion.

7. RECOMMENDATION

The active role of nurses is needed in preparing patients as early as possible to carry out premature ambulation after surgery by conducting pre-surgical exercises on the patients with orthopedic surgery plans so that that muscle strength can be maintained and the patients are more comfortable to carry out early ambulation after surgery. Nurses are expected to be able to provide educate patients in the pre-operative stage of early ambulation to reduce the risk of postoperative complications.

References

1. Departemen Kesehatan Republik Indonesia. Profil Kesehatan Indonesia Tahun 2008 Jakarta: Departemen Kesehatan Republik Indonesia; 2008 [Available from www.depkes.go.id/.../profil-kesehatan-indonesia/profil-kesehatan-indonesia-2008.pdf.]
2. Koentjoro SL, Suroso JA, Suntoko B. Hubungan antara derajat Indeks Massa Tubuh (IMT) dengan derajat osteoartritis lutut menurut Kellgren dan Lawrence. Semarang: Universitas Diponegoro; 2010.
3. Felson DT. Osteoarthritis as a disease of mechanics. Osteoarthritis and cartilage. 2013;21(1):10-5.
4. Michael JWP, Schlüter-Brust KU, Eysel P. The epidemiology, etiology, diagnosis, and treatment of osteoarthritis of the knee. Deutsches Arzteblatt International. 2010;107(9):152-62.
5. Eldawati, Sitorus R, Nasution Y. Pengaruh latihan kekuatan otot pre operasi terhadap kemampuan ambulasi dini pasien pasca operasi fraktur ekstremitas bawah di RSUP Fatmawati Jakarta. Depok: Universitas Indonesia; 2011.
6. Maher AB, Salmond SW, Pellino T. Orthopaedic nursing. 3 ed. Philadelphia: Saunders; 2002 January 15, 2002. 814 p.
7. Smeltzer SC, Bare BG, Hinkle JL, Cheever KH. Brunner & Suddarth's Textbook of Medical-surgical Nursing. 11 ed. Philadelphia: Wolters Kluwer Health/Lippincott Williams & Wilkins; 2010. 2776 p.
8. Lewis SL, Dirksen SR, Heitkemper MM, Bucher L. Medical-Surgical Nursing: Assessment and Management of Clinical Problems. 9th ed. St. Louis: Mosby; 2013 December 16, 2013. 1824 p.

9. Morris BA, Benetti M, Marro H, Rosenthal CK. Clinical practice guidelines for early mobilization hours after surgery. Orthopaedic nursing. 2010;29(5):290-316; quiz 7-8.
10. Hamric A, Hanson C, Tracy MF, O'Grady E. Advanced practice nursing: An integrative approach. 5th ed. St. Louis: Saunders; 2013 July 18, 2013. 752 p.
11. Blaney Davidson EN, Vitters EL, van Beuningen HM, van de Loo FA, van den Berg WB, van der Kraan PM. Resemblance of osteophytes in experimental osteoarthritis to transforming growth factor beta-induced osteophytes: limited role of bone morphogenetic protein in early osteoarthritic osteophyte formation. Arthritis and rheumatism. 2007;56(12):4065-73.
12. Arissa MI. Pola distribusi kasus osteoartritis di RSU dr. Soedarso Pontianak periode 1 Januari 2008 - 31 Desember 2009. Jurnal Mahasiswa PSPD FK Universitas Tanjungpura. 2013;1(1).
13. Andriyasa K, Putra TR. Korelasi antara derajat beratnya osteoarthritis lutut dan Cartilage Oligomeric Matrix Protein serum. J Peny Dalam. 2012;13(1):10-20.
14. Imayati P, Kambayana G. Case report: Osteoarthritis. E-Jurnal Medika Udayana. 2014:218-30.
15. American College of Rheumatology. ACR-Endorsed criteria; 2019 [Available from https://www.rheumatology.org/Practice-Quality/Clinical-Support/Criteria].
16. Potter PA, Perry AG, Stockert p, Hall A. Fundamental of nursing. 9th ed. St. Louis: Mosby; 2017. 1392 p.
17. Hoeman SP. Rehabilitation nursing process, application, and outcomes. 3rd ed. St. Louis: Mosby; 2002. 862 p.
18. Oldmeadow LB, Edwards ER, Kimmel LA, Kipen E, Robertson VJ, Bailey MJ. No rest for the wounded: early ambulation after hip surgery accelerates recovery. ANZ journal of surgery. 2006;76(7):607-11.
19. Nielsen PR, Jorgensen LD, Dahl B, Pedersen T, Tonnesen H. Prehabilitation, and early rehabilitation after spinal surgery: a randomized clinical trial. Clinical rehabilitation. 2010;24(2):137-48.
20. Berman AT, Snyder S, Frandsen G. Kozier & Erb's Fundamentals of Nursing (Fundamentals of nursing (Kozier)). 10th ed. New York: Pearson; 2016 January 5, 2015.
21. Asmadi. Teknik procedural keperawatan: Konsep dan aplikasi kebutuhan dasar klien. Jakarta: Salemba Medija; 2009. 188 p.