

Nursing Intervention for Patient with Total Hip Replacement

A systematic review

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Abstract/Summary

Total hip replacement got much successful in operations for patients with hip problems. However, its complications are seriously and re-admission is almost costly, also prolong hospital stay and more complex in caring. The aim of this study is how nurses intervention does to care and to prevent potential complications developing. By using Grounded theory in article selection and categories structure, also applying "Nursing as caring - A model for Transforming Practice" theory in analyzing and synthetic process with chosen articles to resolve research questions about nurse role in caring and prevent complication for patients with total hip replacement as well.

The results of this study are figured out three themes including recognizing risk factors might develop complications during three stages of surgery with preoperative, intraoperative and postoperative processes; required skills to care and to assist patients in recovery process; especially combinations of nursing skills and tools application such as self-report or clinical reported system to detect and prevent potential complications. The results also point out how to detect through observation and assessment, also education with exercises and using equipment properly in self-care progress; particularly with dislocation which account for the highest risk and being most common complication. Beside that, required nursing time consumption is pointed out as essential in caring.

Language: English

Key words: total hip replacement, nursing care, nursing skills, nursing intervention, risk management, complications, dislocation, complications prevention, time consumption

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1 Introduction

Nowadays, total hip replacement is chosen to treatment for orthopedic and trauma patients. In popular, total hip replacement is considered as the most solution effectively when patients with hip osteoarthritis that being reduced mobility causing muscle weakness and increasing disability. In addition, some other conditions causes hip joint damage such as rheumatoid arthritis, hip fracture, septic arthritis, ankylosing spondylitis, or disorders impact to unusual bone growth. The total hip replacement is useful significantly for pain relief and improve functions of mobility to help patients quick back to normal life. (Lee & Moorhead, 2014)

Although total hip replacement is gained solution in treatment of hip osteoarthritis, but complications after surgery can be challenged for patient, also medical staffs as well. (Lee & Moorhead, 2014)

Regarding to data from the Finnish Arthroplasty Registry on 6989 hips (from the year 1980 to 2004), survived rate was 97%, 46% were revised for aseptic loosening, 20% for recurrent dislocation, 13% for a periprosthetic fracture, and 13% for infection (Daisuke; Hiroyuki; Liisa; Matti; Pekka; Antti; Yrjö & Jari, 2008). "In the United States, there are more than 285,000 THRs are performed each year" (English; Ashkanfar & Rothwell, 2015), the complication rates was from approximately 3.8% to 7% (Dargel; Oppermann; Brüggemann & Eysel, 2014). Also basing on this article, the number of total hip arthroplasty (THA) of the world is estimated about 170% increasing by the year 2030. The complication rate after surgery is belong from 2% to 10%, including aseptic loosening (36.5%), infection (15.3%) and THA dislocation (17.7%). (Dargel et al., 2014)

Hip joints problems are often occurred with older who being with osteoarthritis or fallen because weak bones. Total hip replacement is a common solution for treatment of damaged hip joints that is applied for adults and older increasingly by the day. The success treatment that even including complication managing gives benefits to patients having better life. Nursing roles take part in recovery procedures require skills of caring and complication identifying soon to reduce hospital stays and readmission later then. Therefore, nursing interventions in caring wound and involving of complication

management are essential in recovering processing to improve postoperative mobility for independence quickly. (Lee & Moorhead, 2014)

Total hip replacement is useful for patients with hips problems, but its cost is a big problem and effecting to their financial state. Moreover, if complications are occurred, the costs and caring processes to recovery are much more and complexity. Thus, nursing intervention for patients who going on total hip replacement is necessary to decrease hospital stay and to prevent potential complications occurred.

In this study, with the aim to research nursing role in caring patients with total hip replacement and minimize risk of complications might be developed with combinations of nursing skills and supported tool application.

2 Background

This part describes the basic knowledge about hip replacement, causes lead to need a total hip replacement surgery, as well as its complication may be developed after surgery. In addition, nursing interventions is also mentioned in this part that is necessary in caring patients who suffer a hip replacement surgery.

2.1 Total hip replacement (THR) and Causes

This part describes the basic knowledge about hip replacement, causes lead to need a total hip replacement surgery, as well as its complication may be developed after surgery.

2.1.1 Anatomy of hip joint

The hip joint is one of the largest and most stable joints in the body. They help keep balance in gait with head of the femur inserts deeply the acetabulum of the pelvis when moving (Magee, 2014, 689). The cavity is a ring of cartilage attached to the rim of the acetabulum where is for insertion of acetabular labrum to help the stability of the joint with no limiting the range of movement. The capsule with synovial fluid surrounds the joint to increase stability of the joints when moving (Walker, 2010, 52). The joint has a strong capsule and very strong muscles that can able to control physical activities when walking. If these joints are injured, they affect to the gait directly (Magee, 2014, 689).

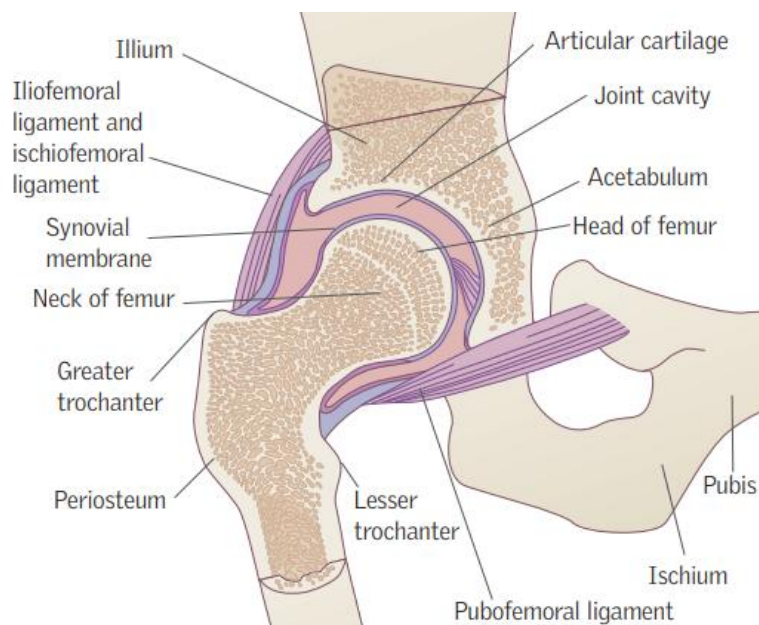


Figure 1 - Anatomy of the hip joint (Walker 2010, 52)

2.1.2 Total hip replacement (THR)

The hip is a large ball-and-socket joint. Connecting of acetabulum and femur makes the up hip joint in which acetabulum is part of the pelvis forming socket and the upper part of femur forms the ball. Articular cartilage cushions at the ends of bones and lubrication substance at the synovial membrane surrounds the joints help movement smoothly. The hip joint is must stable and strength enough because during ambulation and movement, the joints are pressured of body's weight. If there is extra pressure on the joints causing wears down over time which will develop to arthritis quickly and reduce function of mobility. (Perkins, 2021, 29-30) (Adamidou, 2017)

Total hip replacement is the removal the both of ball-and-socket joint by insertion of artificial balls that is known as implantation to a patient's body. This replacement is for restore normal function in movement. (Stuart, 2011, 2)



Figure 2 - Illustration of total hip replacement components (Stuart, 2011, 2)

Therefore, a hip total replacement is a type of surgery which replaces damaged hip joints by artificial hip. The goal is to alleviate pain and improve movement function of patients suffering from arthritis and chronic joint symptom. The age that can be considered for a THR is at least 15 years old, and almost adults. Patients with 80 years old and older need to be considered to do a THA because of complications after surgery. (Perkins, 2021, 29-30)

A THA can be done under a general anaesthetic or an epidural. The two most common THR approaches are the posterior and anterior approach in which anterior approach helps decrease the risk of associated complications. (Perkins, 2021, 31-32) (Adamidou, 2017)

The posterior approach is a surgery with the position of incision at the posterior rim that follows the axis of the femur (Breusch & Malchau, 2005, 3). Meanwhile the anterior approach uses the inter-muscular plan that the incision is made through the front of the leg. Closure of this approach is easiest and fastest and provides the best result in cosmetic. (Breusch & Malchau, 2005, 12) (Perkins, 2021, 32)

2.1.3 Causes

There are various conditions that can lead to a necessary for a THR such as osteoarthritis, rheumatoid arthritis, osteonecrosis, childhood hip disease (Perkins, 2021) (Adamidou, 2017).

They are described as following.

- a. Osteoarthritis (OA) is known as the most common form of arthritis causing damage joints which affecting million of people worldwide. Osteoarthritis is the leading cause of pain and disability that can make worn or damaged to the extent of mobility, especially in older people, which being the most cited reason for needing a THR. (Stuart, 2011, 13). Beside of causes that may be developed osteoarthritis like age, it can come from repetitive activities daily that cause wear the joints and affect to other organs in the body. In addition, other factors including being overweight, joint laxity, joint deformity, abnormal articular cartilage, or overuse and other impacts from sport activities in long time which cause osteoarthritis (Stuart, 2011, 13-14).
- b. Rheumatoid arthritis is a disease of the synovium, the lining tissue of the joint that may lead inflammation and proliferation which affect to the joints by destruction of the cartilage and underlying bone. (Stuart, 2011, 16-17)
- c. Post-traumatic arthritis occurs when there is an acute trauma to joints directly that may cause inflammation arthritis (Leonardo; Paola; Roberto; Marta; Roberta; Francesca & Anna, 2016). It often is caused by injury with a hard bruise to the hip joint that damages to surface or articular cartilage of the joint and affects to movement with prolonged pain and stiffness (Stuart, 2011, 18). Repeating of injuries and obesity may develop to post-traumatic arthritis and can cause acute or chronic disease leading to the need for a THR (Perkins, 2021).
- d. Osteonecrosis is interruption of circulation to femoral head causing poor blood circulation and leading to necrosis of the bone. It is also called as avascular necrosis (Perkins, 2021). This causes dying the bone and painful in moving, and impact to the head of the the femur is out of the socket, wear and tear in capsule (Stuart, 2011, 20). The risk of osteonecrosis may be developed in patients with much alcohol intake, corticosteroid use, or dislocation (Perkins, 2021).

- e. Two childhood hip diseases are result from developmental dysplasia of the hip (DDH) making abnormal wear and tear and Legg-Calvé-Perthes disease (LCPD) causes disturbing blood circulation to supply for the femur, leading to necrosis. (Perkins, 2021). In addition, there are two other major types that develop to arthritis such as perthes disease with abnormal shape of the femoral head by deforming of the acetabulum and slipped capital femoral epiphysis (SCFE) with deforming of the femoral neck and sometime its rotated backward (Stuart, 2011, 23).

2.2 Complications

Depending on studies about THR complication, there are many risk factors that can lead to complication. This study is not mentioned about the risk factors lead to complication in detail, but describes complications and nursing interventions on those. The complications in THR which can be included such as infection, dislocation, fracture of bone, venous thromboembolism (VTE), myocardial infarction, pulmonary embolism, neurovascular injuries, skin breakdown, bleeding, aseptic loosening, mechanical complications. (Perkins, 2021)

Below is some main complications often occur with hip replacement.

- ✓ The venous thromboembolism (VTE) is common complication of patient who undergoing orthopedic procedures (Walker, 2010, 19). It is known as existing of blood clot in the deep veins of the calf, thigh or pelvis (Stuart, 2011, 163). It is one of complications that causes the death after THR (Steffen & Henrik, 2005, 320).
- ✓ Thrombolytic complication include deep vein thrombosis and pulmonary embolism. This complication has higher risky with patients with cardiovascular disease, obesity or bowel inflammation. (Janie, 2005) (Abdel, 2017)
- ✓ Infection may occurs in any surgical procedure through breaking the skin. The infection can be developed in postoperative period with infection of bacteria such as *Staphylococcus aureus*, *Staphylococcus epidermidis*, *Streptococcus*, *Pseudomonas aeruginosa*, *Escherichia coli.*, Anaerobes, other gram-negative organisms. (Postel; Kerboul; Evrard & Courpied, 1987, 117) (Walker, 2010, 19)

- ✓ Dislocation occurs when the ball of the hip is out of the socket (Stuart, 2011, 169). It is a result from decreasing of muscle tone affecting to hip instability during movement (Walker, 2010, 19) (Abdel, 2017).



Figure 3 - Total hip dislocation. The ball has come out of the socket (Stuart, 2011, 170)

- ✓ Pulmonary embolism (PE) is one of serious complications of THR. It usually occurs in the early perioperative and along with VTE are complication causing the death after THR. (Steffen & Henrik, 2005, 320)
- ✓ Loosening is known as fixation of the prosthesis has failure with arising abnormality of clear space around the cup at the cement-bone interface. (Postel et al., 1987, 79)

Once complication occurs is to lead long hospital stay or readmission for revision later then which cause severe physical and psychological pain, even for revision by additional surgeries such as dislocation, fracture of bone. Thus, preventing complications and caring during recovery periods are important in caring patients with THRs. (Perkins, 2021)

2.3 Nursing Intervention

Recovery from hip replacement can be prolonged and painful, so nursing skills are needed in postoperative procedures that help patients can recovery from surgery and prevent complications from new joint replacement.

Below is described as nursing interventions in recovery process and complication management. Nursing skills are mentioned in detail.

2.3.1 Routes and nursing consideration

The route in which nurses have to take responsibilities in caring patients with THRs need to be considered belong of:

- Preoperative stage that nurse needs to prepare a patient's medical history with X-rays or MRI, assessment for cardiovascular risk through peripheral artery disease and venous thromboembolism, also supply to patient about surgical basically such as postoperative plan containing information of exercises and assistive devices to support movement rehabilitation (Perkins, 2021, 32). Other side, assessment of reduced mobility, increasing disability, muscle weakness and loss of function affect to time of staying hospital. Needing to have preoperative preparation for maintaining and improving health before surgery. Basing on these parameters, nurse has discussion surgery and raises any concerns (Walker, 2010). Medication for this stage can be applied such as acetaminophen or non-steroidal anti-inflammatory drugs (NSAIDs), or opioids with nonnarcotic and narcotic analgesics is used in treatment for waiting total joint replacement surgery (Bono; Robbins; Mehio; Aghazadeh & Talmo, 2012).
- Postoperative stage that nurse needs to monitor patient's neurovascular status, pain level, and movement function. Nurse needs to support patient for leaving out bed and moving early (no later than 1 day after surgery), as well as assessment of pain level need to be paid attention to observe complication capability (Perkins, 2021, 32). The parameters such as blood pressure, respiratory rate, oxygen saturation and temperature need to be concerned, as well as monitoring signs of dehydration, shock or increased levels of pain (Perkins, 2021). Medication that may be applied in this stage such as scheduled doses of acetaminophen up to 4000mg/d, or celebrex 200 to 400 mg/d is administered for 6 weeks postoperatively, or COX-2 inhibitors is applied to reduce risk of bleeding and hematoma formation. In addition, physical therapy is maintained for recovery with long-term results. Thus, the combination of pharmacologic modalities and physical therapy should be continued until the range of motion has been restored completely (Bono et al., 2012).

2.3.2 Complication management

Some complications may result in additional surgeries or extended hospital stay. The complications can be:

- ✓ Infective complications - Infection occurs when there is infection of bacteria with gram-positive, *Staphylococcus epidermidis* and *Streptococcus* or gram-negative. Infection may distinguish with early infections, true late infections and secondary infections (most common) (Brunazzi; Ferrat; Häfliger; Klein; Kohler; Lüem; Maurer; Münch; Nachbur; Ochsner; Pirwitz; Riede; Sarungi; Schafroth; Schweizer; Sommacal; Stöckli; Thomann; Toia; Vaeckenstedt, 2009). Other infection can come from wound hematoma or blood borne (Stuart, 2011, 156). In some cases of patients with diabetes mellitus, transplantation, compromised immune system, psoriasis or sickle cell disease can be risk of complication (Stuart, 2011, 157).
 - Early Infection - can appear during the first 4 days after surgery, the wound is contaminated during surgery. However, this is an uncommon complication, rare occurrence. The sign may be systemic signs including red, hot, swollen and painful. (Postel et al., 1987, 106-107)
 - Acute Infection of late onset - unrelated to any contamination during surgery. They are result of hematogenously spreading from septicemia or bacteremia that affect to prothesis but it was rare occurred. (Postel et al., 1987, 106-107)
 - Bacteria infection - spreading from bacteria such as *Staphylococcus aureus* (low incidence, are considered as the acute infections), *Staphylococcus albus*, *Corynebacteria* (wide range of organisms, are considered nonpathogenic). In other cases tuberculous infection are diagnosed on several hips. (Postel et al., 1987, 114)
- ✓ Dislocation occurs when the bones in a joint are out of right position and become separated. Dislocation causes severe pain and effects to joint stable and unable to move (Brunazzi et al., 2009). The risk of dislocation in posterior approach is higher than the anterior approach. The anterior approach has reduced risk of dislocation, faster recovery, less pain and have less complications in surgery (Matta & Sah, 2022).

- ✓ Aseptic loosening is abnormalities of acetabular fixation that causes pain in the groin area. This occurs because of loose components of bone-cement interface or poor quality in bone growth (Brunazzi et al., 2009) (Janie, 2005). Loosing cause pain in either activities or sitting with feeling the joint is coming out the place (Stuart, 2011, 197).
- ✓ Thrombotic complication include deep vein thrombosis (DVT) and pulmonary embolism. This complication has higher risky with patients with cardiovascular disease, obesity or bowel inflammation (Janie, 2005). In which venous thromboembolism (VTE) occurs over 40% of complications in patients undergoing orthopaedic procedures, and pulmonary embolism is much less than VTE. The factors such as age, immobility, obesity, respiratory problem, or family history of VTE cause increase the risk of complication during and after surgery. Signs of DTV include oedema, tenderness and redness at the area (Walker, 2012).
- ✓ Bleeding is a potential complication, and it is especially serious if it comes (Brunazzi et al., 2009). However, this complication was rare occurred.

2.4 Pain relief

Nursing role has responsibility in improving pain relief for patients who have acute pain in post-trauma period and postoperative pain. To manage pain effectively, pain assessment and pain control need to be focused and considered carefully.

2.4.1 Pain management

Pain is known as a psychological sensory experience that need to be considered carefully. Developing of pain can develop chronic pain that including psychological issues, preoperative pain, surgical trauma, nerve damage, or acute postoperative pain. (Vilardo & Shah, 2011)

Pain causes debilitation of body's function and is challenging to manage (Carr; Layzell & Christensen, 2010, 6). Pain is a characteristic factor that presenting in injury response, pain control can be difficult to manage and monitor effectively in post-trauma period. In particularly, fractures of the hip are common risk of falling among older people who are

over 80 years and the majority are female may lead serious consequences such as loss in mobility and independence, prolonged hospitalization, or even cause death. In particular, patients with fractured neck of femur need to be cared in pain control, fluid and oxygen resuscitation and adequate pressure area for preoperative stage. (Carr et al., 2010, 11-12)

Pain control is especially concentrated in fractured neck of femur because of significant pain in movement. There is relative between serious post-operative complications such as deep vein thrombosis, infections, sepsis, paralytic ileus, acute renal failure and uncontrolled pain (Carr et al., 2010, 12). Pain relief is necessary to support the patient's mobility after surgery. Nurse has to monitor and assess patient's pain and pay attention on benefits and side-effects of types of analgesia used (Lucas, 2008).

2.4.2 Pain assessment

Pain is defined as "an unpleasant sensory and emotional experience associated with actual or potential tissue damage or describes in terms of such damage". Inadequate treatment of postoperative pain causes risk of persistent postoperative pain that can develop complications. (Jessica; Charles & Christopher, 2015)

Pain assessment is important to have suitable care and help patients releasing the pain. Diagnostic can be listed as following:

<i>Type of pain</i>	<i>Possible causes</i>
Dull, deep, aching	Arthritis, paget disease
Sharp, intense, sudden, associated with weight bearing	Fracture
Tingling that radiates	Radiculopathy, spinal stenosis, meralgia paresthetica
Increased pain while sitting with the affected leg crossed	Trochanteric bursitis
Pain at sitting, legs not crossed	Ischiogluteal bursitis

Pain after standing, walking	Hip arthrosis
<i>Type of pain</i>	<i>Possible causes</i>
Pain on attempted weight bearing	Occult fracture, severe arthrosis
Unremitting, long duration	Paget disease, metastatic carcinoma, severe arthrosis (occasionally)

Table 1 - Diagnostic Clues in Hip pain (David, 2014, 693)

Pain is suffered through by three stages of surgery, if there is not caring carefully, it is easy to develop chronic pain. The assessment including:

- ✓ *Preoperation pain* sensitivity - self-reported preoperative pain has been connected with factor of chronic pain after surgery. (Vilardo & Shah, 2011)
- ✓ *Intraoperative pain* - acute postoperative pain intensity (48 hours after surgery) is one of cause that may transform to chronic persistent pain. (Vilardo & Shah, 2011)
- ✓ *Postoperative pain* - hip replacement cause neuropathic pain that is one of cause chronic pain. Thus, prevention of pain is necessary and effectively with early postoperative pain control is controlled carefully. Faster recovery time is dependent controlling of pain. The pain can be controlled better by using epidural, femoral nerve block, or pain. (Vilardo & Shah, 2011)

2.5 Nursing skills

Controlling pain is a key to prevent complications forming, thus nurse intervention immediately makes recovery time faster as well as reducing hospitalization stay. The intervention may be monitored with skills that need to be concentrated following.

- ✓ *Patient education* - the pain is an issue that need to be concerned in any surgery, thus evaluation at preoperative stage release outcome that supply the information for patients and give discussion. Expectation is minimize of pain after surgery, thus the factors such as anxiety, depression, neuroticism, and catastrophizing are assessed carefully. (Jessica et al., 2015)

- ✓ *Pain relief* - pain relief is especially important in recovery progress that allows patients to mobilize as soon as possible after surgery. Pain relief is depending on type of anaesthesia used that must be released in first 24-48 hours, then step down with paracetamol and conventional nonsteroidal anti-inflammatory drugs. Nurse must have look at benefits and side-effects of analgesia used to avoid high risk of opioid dependency in acute postoperative recovery. (Lucas, 2008)
- ✓ *Wound care* - the hip replacement has surgical wound that may develop complication if it has not cared carefully (Lucas, 2008). Wound infection can develop from superficial to deep if the bone or prosthesis is infected (Walker, 2010). Therefore, the wound care affects to healing and recovery progress. Sutures or staples can be used to close the wound for 10 - 12 days. There are vary wound dressing can be used such as Tegaderm, fabric adhesive dressing or film dressing (Lucas, 2008). Therefore, wound care need to be monitored in healing and recovery, as well as minimizing potential complications in infection (Brunazzi et al., 2009).
- ✓ *Mobilization* - patient should be come back as soon as possible after surgery. Nurse supports patients in rehabilitation progress with exercises to strengthen the muscles, as well as walking or climbing stairs that ensure moving possibility. Normally, physiotherapist teaches exercises and nurse can help to ensure the paints who are doing correctly and encourage them to maintain their behavior for exercising. Patients often start with walking frame or crutches because of body's weight. (Lucas, 2008)
- ✓ *The venous thromboembolism prophylaxis* - venous thromboembolism is a state of blocked blood vessel by a blood clot that is high risk in total hip surgery. Nurse should monitor carefully by using the Autar DVT tool in risk assessment scale. Beside that, T.E.D anti-embolism is considered as a mechanical method of prophylaxis, as well as the A-V impulse system is applied for an injection to inhibit coagulation with 4 weeks after surgery. (Lucas, 2008)

3 Aim

The aim of this study is to gain better knowledge of nursing intervention in caring and preventing potential complication for patients who undergoing total hip replacement.

Research questions

1. What is the nursing role in intervention among patients with total hip replacement?
2. What is the prevention of potential complications among patients after total hip replacement?

4 Theoretical Framework

This study choose the theory of “Nursing as caring - A model for Transforming Practice” which was written by Dr Anne Boykin and Dr Savina O. Scheonhofer in 1993 as a theoretical framework. The theory was mentioned about the important of caring which have assumptions as caring basing on personhood that was developed through participating of relationships with caring others.

Parts were presented as cores of theory as known as assumption and theory’s concepts.

Assumptions

The theory assumed through out six main points which were mentioned about caring person, personhood and nurse professional.

- ✓ *Caring person* was described with three main concepts such as a concept with virtue of their humanness that considering as a process that is developed throughout his/her life to express of his/her competency in caring. Thus, caring is considered as key of being human. Other view, persons are caring with moment to moment that caring is lived moment to moment and always open to know more and more and develops over time. To be caring person who is to live caring, and to develop understanding each other throughout lifetime. As well as another view of caring persons as whole or complete in the moment which was supposed as a caring person

is developed individual throughout life experiences. A caring person learn to live with fully experiences is easier self-care, also develop caring capabilities for other ones.

- ✓ *Personhood* was described with two points that supposed as a process of living grounded in caring, with this concept that personhood is presented through combination between beliefs and behaviors. Caring is improved and enhanced through living caring and always open to know each other. Other point personhood is enhanced through participating in nurturing relationships with caring others, this was clarified as developing relationship with others throughout caring and participating in nurturing relationship. All relationships have mutual expectations, and thus responsibility for themselves and others are necessary that caring holds are important in connections between them.
- ✓ Nursing was described as a *discipline*, also as a *profession* as well. Discipline is known as principles of “a way of knowing, being, valuing and living” and profession of nursing is defined as an understanding of social need and responding from nurse by using these principles.

Concepts

In the theory, concepts was mentioned with six main points. The first concept was about nursing intention and focus that is mentioned as a relationship between nurse and patient. This aims to help and assist patient throughout personal knowing as much as with nurses. The second one was about caring perspective on people that was defined as an action to share caring to others that would be developed by the time. The third one was about nursing situation that is built on commitment of human caring belief. Therefore, actions to become closer in caring. Three last concepts were presented with sharing and caring to know each other. With the concept as personhood that was defined as actions of always open with others throughout self-care and caring others. Other concept was mentioned about direct invitation that was described with patients feel free to share what their problems with nurses. And the last one was about responses of nurses with nurse offer a professional understanding with kindly for helps needed.

The study is basing on this theory to finding the connection between nurses and patients as care person with professional understanding and personhood which aim to assist

patients release fear or anxiety before surgery, as well as know more to have co-operation in recovery stage. (Boykin & Schoenhofer, 2013)

5 Methodology

The qualitative approach is to identify and limit problem need to research and to limit the effects of extraneous variables which lead to result of non-relevant researches and not the focus on the study (Susan; Nancy & Jennifer, 2012).

Below describes definitions of a systematic review, also the method to collect data and how to analyse them.

5.1 Systematic literature review

A systematic literature review is a synthesis of research that is to identify a specific review question to indicate all relevant studies, select and synthesis of research evidence relevant to research question to find out the answer to that question or a clinical or may be conducting conclusion or carried out report which can be chosen to start. (Josette, 2012)

Some opinions are about using systematic review methodology that gives benefits in finding a top of hierarchy evidence, like Craig and Smyth (2007:185) state: "Because systematic reviews include a comprehensive search strategy, appraisal and synthesis of research evidence, they can be used as shortcuts in the evidence-based process". Also as Khan et.al (2003:1) suggest that "a systematic review is a research article that identifies relevant studies, appraises their quality and summarize their results using a scientific methodology". (Josette, 2012)

In addition, the systematic review helps to reduce the time and expertise to locate, appraise and synthesize individual studies. (Josette, 2012)

With qualitative approach, this study uses method of systematic literature review to collect, analysis, synthesis and structure to a systematic review for nursing intervention in caring patients with total hip replacement state.

5.2 Data collection and Sampling

In analysis process, data collection aims to reflect on the meanings obtained from the data, structure, manage and synthesize the amount of data. (Susan et al., 2012)

The data was collected basing on criteria condition to resolve research questions for researching purpose of this study. Specifically, in this study to find out the effect of nursing interventions on patients with total hip replacement in the recovery process and prevent complications. Below describes the method to collect data which is using in this study.

5.2.1 Data collection

Basing on aim of study with two research question that related to nursing intervention impact to patients with total hip replacement to recovery quickly and prevent complication. Thus, starting to collect suit articles by using criteria condition to search including {“hip replacement” AND [“nursing intervention” OR “ nursing care” OR “nurse roles”] AND “complication”}, the documents after searching are selected and picked up relevant items with 431 items. From the list, removing duplicated items, and minimizing the list by searching one more time with {“hip replacement” OR “hip arthroplasty”} on the title and the 2nd list is collected with 58 items. Last filter is with time range since “2012” and the last result collects with 17 items. Scanning to pick up suitable articles by reading quickly abstracts and content of articles, also scanning reference’s list of articles and picking up some articles for quickly reading. There are 8 articles selected after scanning by reading quickly the content of articles.

The process is described as 5 steps as below.

- *Step 1*: Filter on databases to find articles with criteria including “hip replacement” and (“nursing care” or “nursing intervention” or “nurse roles”) and “complication”
- *Step 2*: Filter on title of filtered article at step 1 with criteria “hip replacement” or “hip arthroplasty”
- *Step 3*: Sort range published time with “2012 - 2022” of filtered articles at step 2

- *Step 4*: Scan abstract and read quickly content of articles at step 3

- *Step 5*: Scan Reference list of filtered articles at step 3 and choose relevant articles by reading content quickly.

Combination of selected articles at step 4 and step 5 to collect articles which are using in this study.

Figures below describe these procedures.

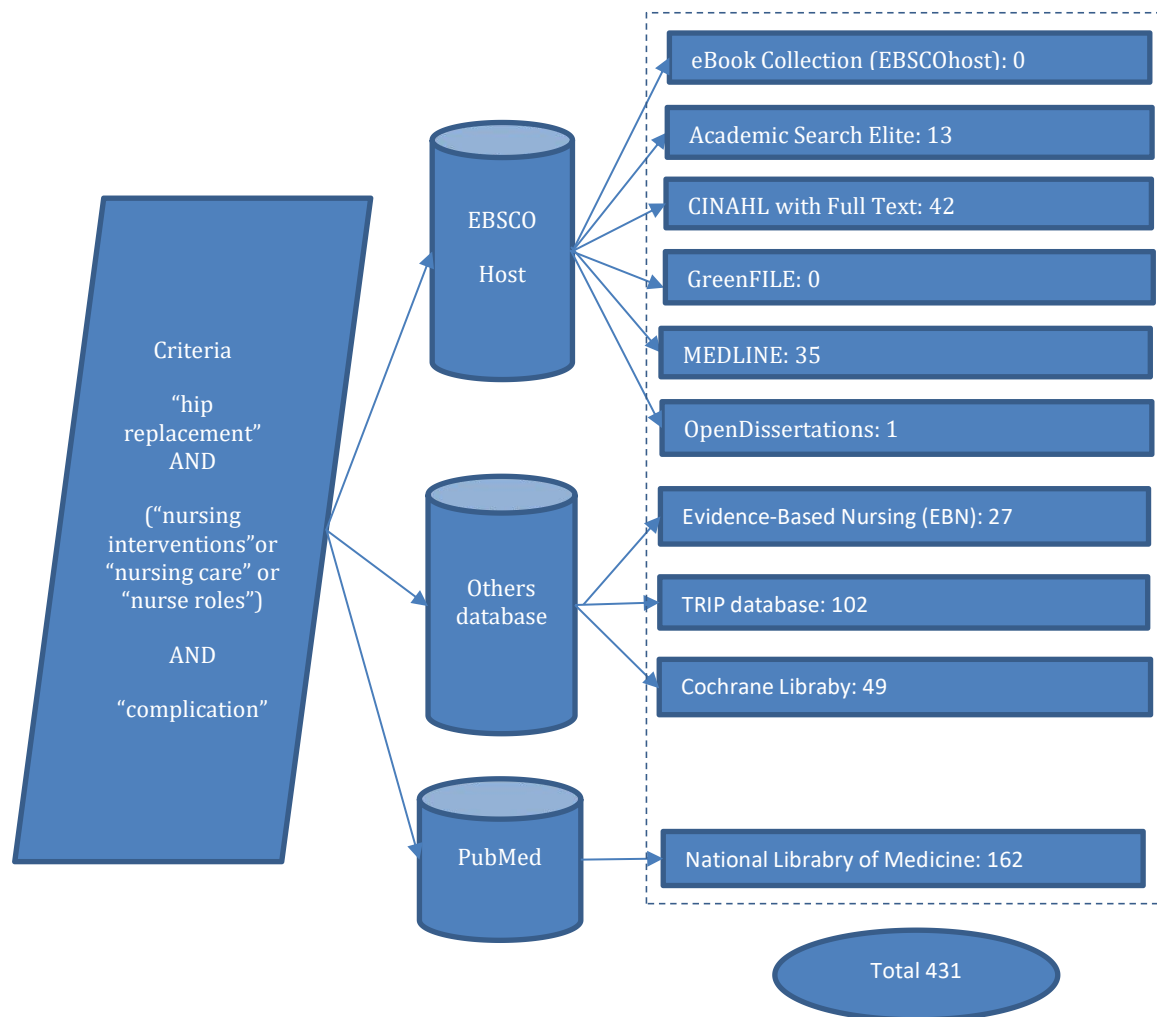


Figure 4 - Collecting articles basing on common criteria

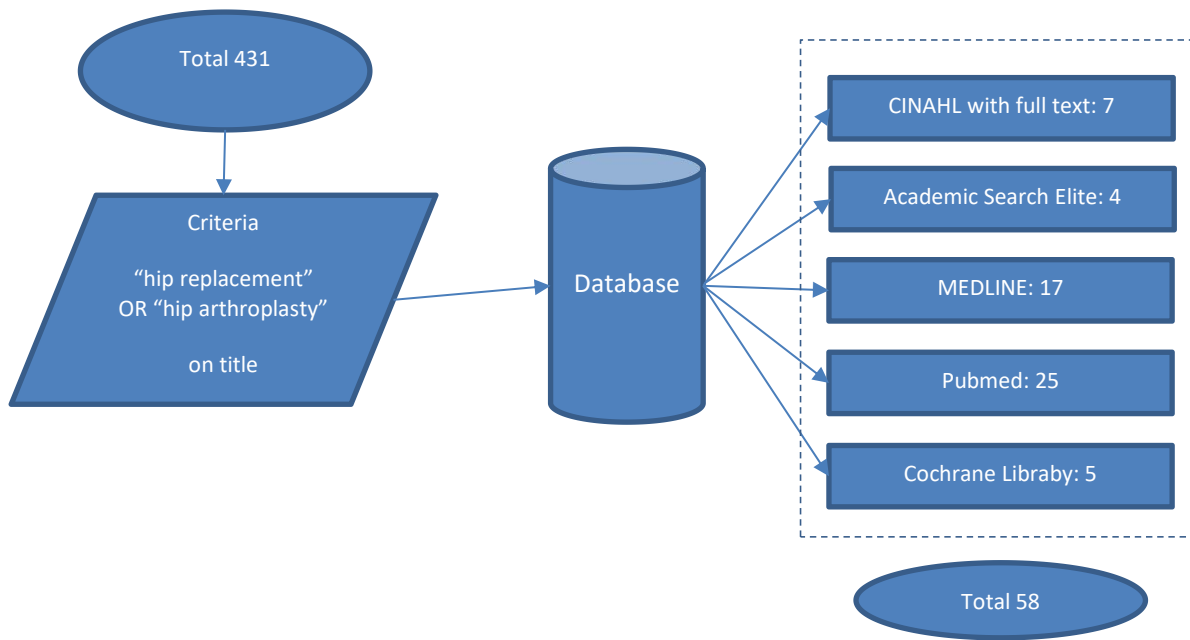


Figure 5 - Address materials that mentioning the subject correspondingly

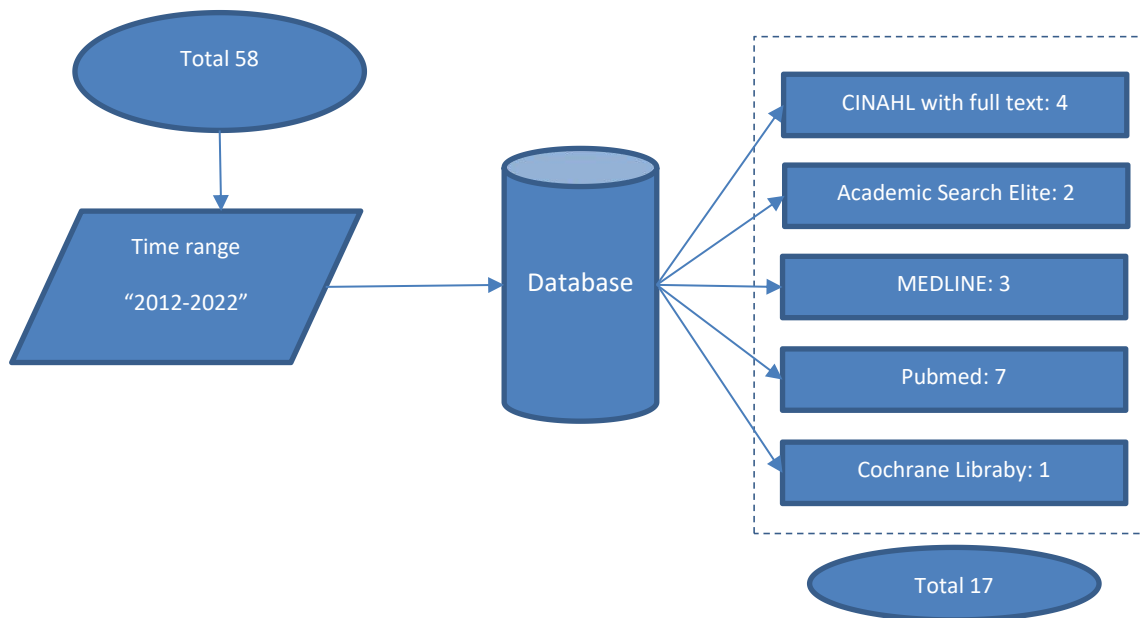


Figure 6 - Finding the newest materials within 10 years

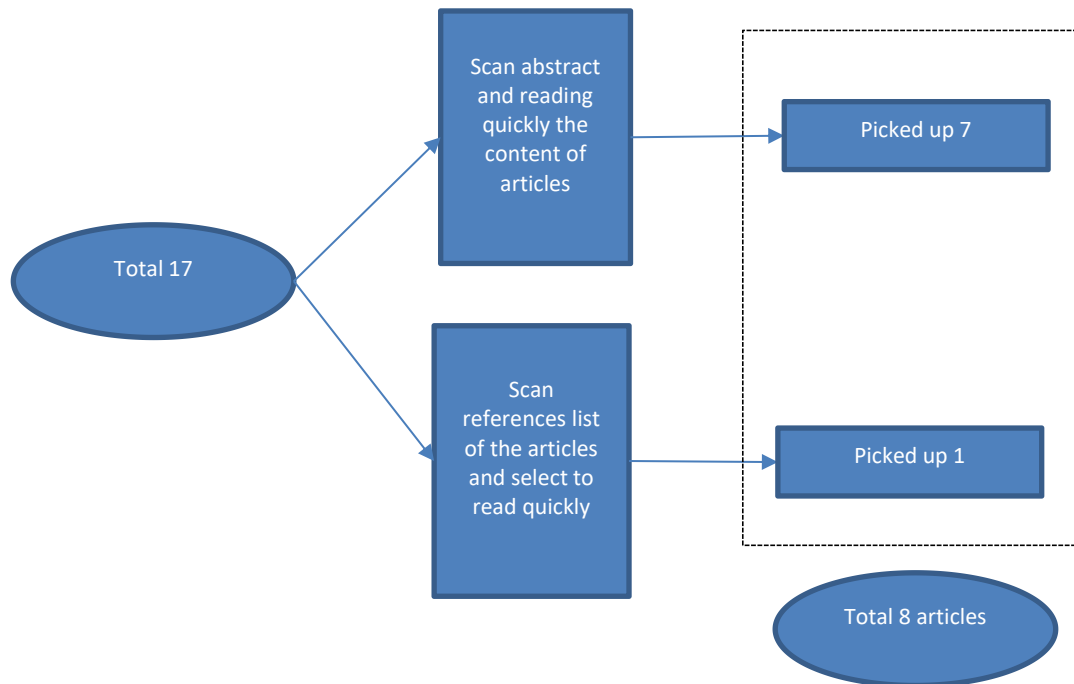


Figure 7 - Material selection that are used in the study

5.2.2 Article selection and sampling

With items were listed out at 3rd filter, there are one book about total hip replacement, one book of 29 case studies with differ complications in detail, one article has 4 chosen care studies of patients with hip replacement and their assessments, one articles has mentioned about complication rate, one article is about assessment and intervention for patients awaiting total hip replacement, seven articles are related to nursing intervention to specific complications, one article is mentioned about pain management, two articles mention about readmission rate, and three articles are not relevant after screening. At last step, scanning some articles from reference list of some articles, there is one article about pain management that was chosen for analysis processing. Also, there are six books and two articles about common knowledge of total hip replacement which was found separately to use.

Therefore, in this study, totally there are six books and ten articles were selected in which there are six books and two articles are used for background with common knowledge of hip replacement but not adapt for research questions and eight articles are used for analyzing process.

5.3 Data analysis

The selected articles are included three types of data analysis which are statistical approach, descriptive analysis and meta-analysis (Susan et al., 2012).

With chosen articles above and basing on method of data analysis from Grounded theory methodology, this study uses narrative analysis which is a qualitative approach with using statistical data, to describe and structural analysis focused on contents of nursing intervention in caring patients with vary complications, as well as merging some synthetic data in some specific parts by structuring of categories. (Susan et al., 2012)

Applying analyzing method of Grounded theory, the study are oriented to find characters of nursing interventions in caring patients to prevent potential complications that are done by three following processes.

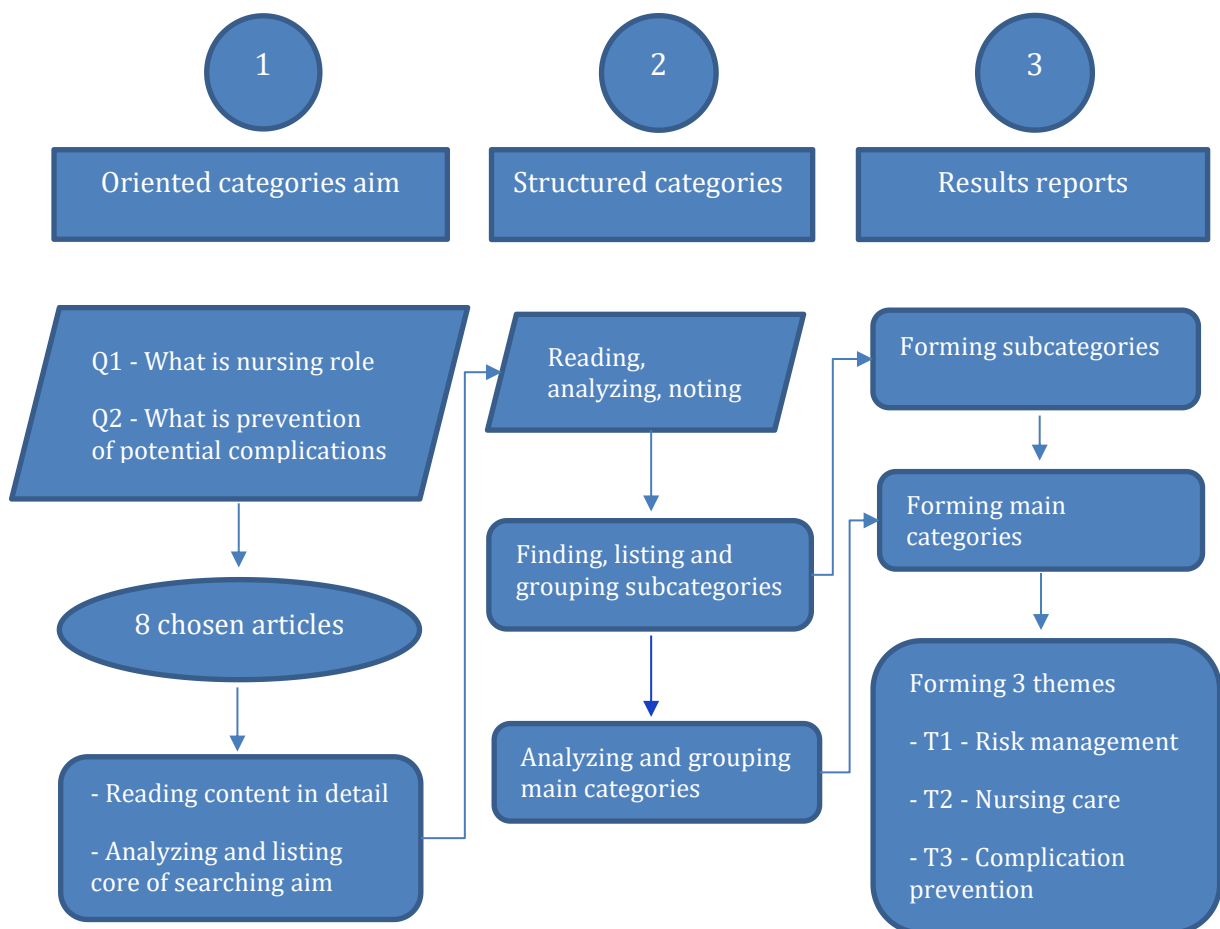


Figure 8 - Formed results from analyzing process with chosen articles

Regarding to aim of this study with two research questions, analysis process was a synthetic data progress with different sources, as well as various variables to response nursing intervention in caring patients and complication management, as well as the articles are chosen basing on applying theory of “Nursing of caring” to response research questions that sorting out 8 articles with division for:

- ✓ Selecting articles that listed at Table 2 in Index part where consisting whole of materials of used background knowledge and chosen articles also.
- ✓ With orientation to looking for nurse’s role in intervention and caring patient, core of analyzing process with chosen articles is listed in the Table 3 at Index part.

Analyzing process in detail is presenting at part 7.

6 Ethical consideration

This study uses available articles or books which are published from scientific journals to describe, analyze, combine and make a systematic review about nursing intervention in caring patients with total hip replacement. Also knowledge or contents including images, tables, or sentences are used in the study which are cited from original sources are clarified with own sources as well. (Susan et al., 2012)

The study adheres general ethical principles in researching, collecting data, or quote content which are cited correctly with reference source clearly. The study does not cause significant risks, damage or harm to communities or other subjects of research. (TENK, 2019)

The study also is adhered ethical considerations about fabrication or plagiarism seriously.

7 Results

As mentioned in part 5, by applying Grounded theory to take out the answers which response to 2 research questions, also applying “Nursing as caring - A model for Transforming Practice” theory to figure out the results with structured subcategories, then forming categories and grouping to themes.

The study was analyzed basing on eight articles in which six articles are quoted in own analyzing processes and two articles are evidenced with results of the analysis. End up of analysis was distinguished by three themes, including *Risk management*, *Nursing intervention*, and *Complication prevention*. The important in results is found nursing skills required in caring patients, especially the results also are found the important for combination of nursing skills and using other supported methods, also minimum nurse’s time consumption to care a patient with total hip replacement in hospital stay to recovery and prevent complications occurred.

The results are found with each theme that are shown with group of main categories, sub-categories and quotes of meaningful unit was mentioned at Index part from Table 4 to Table 8.

Detail of this analyzing progress is described as below where results of analysis and synthetic process with specialized categories presenting with collected tables are combined.

7.1 Theme 1 - Risk management

Risk management are risk factors through three stages of operation including preoperative, intraoperative and postoperative process impacting to patients that might cause potential complications. Generally, risk factors was distinguished belong to surgical stages with age, patient with comorbidity, surgical method, anxiety and fear, infection, poor parameters of examination. Results in detail were found that specialized structures with evidences presenting at Table 4, 5, 6 in Index part.

Structured results of this theme was summarized as figure below.

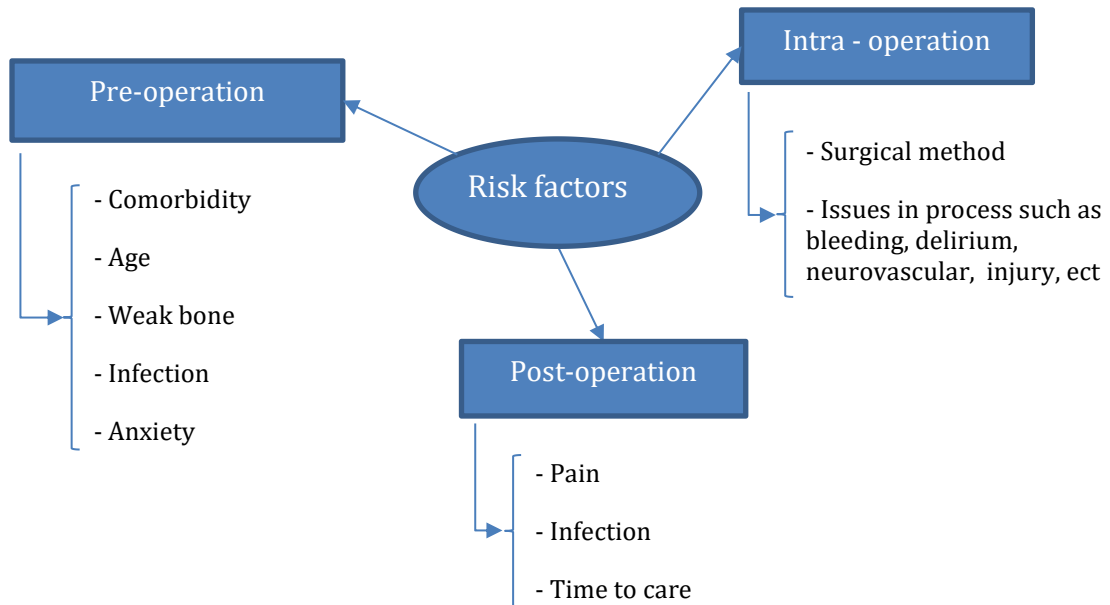


Figure 9 - Risk factors in surgical process

In this theme, the risk factors are presented by procedures of surgical process, including preoperative, intraoperative and postoperative process. Those factors can be causes to lead to total hip replacement surgery, or be signs that affect to patient in surgery, or can be other effects may develop potential complications after surgery.

Almost causes leading to total hip replacement surgery are defined such as arthritis of the joints that is known as primary disease or secondary processes such as osteoarthritis, Ankylosing spondylitis, rheumatoid arthritis, post-traumatic arthritis like fracture of the neck of the femur developing to osteonecrosis, childhood hip disease. (Walker, 2012) (Perkins, 2021)

There are unexpected factors affecting to any surgical processes such as vary illness might loss of functions of organ system (Lee & Moorhead, 2014), or nursing work load also affects to nursing intervention during association directly or indirectly (Lee & Moorhead, 2014) or "Assemble/prepare equipment, cleanse if applicable" (Lee & Moorhead, 2014), or lack of equipment, also non-supported services affect to inadequate plan that might prolong hospital stay and delayed discharges (Walker, 2012) or even costly also is other factor (Lee & Moorhead, 2014).

The risks may occur in any surgery and they go through three stages including preoperative procedure, intraoperative procedure and postoperative procedure. The risks can develop to become complications and they become complex issues need to be resolved. Early detecting of risks reduces the complications minimally.

Tables 4, 5, 6 at Index part describes risk factors that nurse needs to pay attention basing on surgical procedures.

Preoperative procedure - at this stage, assessment of nurse in the risk is mainly basing on patient's history content is quote in detail with mentioned in Table 4 of Index part.

Regarding Perkins, also Lee & Moorhead through original assessment of weak bones, older who often have other included diseases easy develop to be complications and prolong hospital stay (Perkins, 2021) (Lee & Moorhead, 2014). Beside that, by Walker the variance of measured parameters at this stage and in intra-operative process could be cause of complication (Walker, 2012), also anxiety might be lead to other complications (Pulkkinen; Junttila & Lindwall, 2015).

The risk of patient's history, especially existing diseases of patients may impact to intraoperative and postoperative processes which can cause unwanted consequences. Basing on Lee and Moorhead with analyzing on collected data from admitted patients, risk factors affect to complication and dosage of nurse intervention. Effective dose of nurse in complication was shown in article of Lee and Moorhead about average hours a nurse needed to spend for the intervention "Care plan" was about 3.6032 ± 1.0571 hours which includes "shift assessment on behavioral, skin, respiratory, gastrointestinal, incisional pain, and neurological conditions, as well as review and evaluation of care and the patient's response." (Lee & Moorhead, 2014). Especially patients with old age, or multiple comorbidity cause risk of VTE easier which affecting the dose of nursing interventions (Lee & Moorhead, 2014), (Walker, 2012) (Lee & Moorhead, 2014). Thus, defining risk factors is necessary in prior stage to build an individual care plan for patient and to follow, and to protect potential complications as well.

Exception of risk assessment, regarding to Walker, to prepare for surgery, nurse need to provide patients information about surgery and recovery processing with pain relief, exercises (Walker, 2012), also have listening, sharing to reduce anxiety in surgery and

support recovery process quickly (Pulkkinen, 2015). Also preoperative education is confirmed that it is “necessary and important”, also having discussion to raise some concerns (Perkins, 2021) (Walker, 2012) about postoperative plan, exercises with walking or from other equipment support, as well as antibiotic may be applied to protect infection (Perkins, 2021).

Intraoperative procedure - at this stage, risk assessment is handled with surgical method which is known as anterior approach and posterior approach. Evidences show that anterior approach has a recovery faster than rest one. Thus, the risk of this procedure is depended on patient’s health in surgical process and surgical technique (Schultz et al., 2017) (Walker, 2012).

Basing on Schultz and Ewbank and Pandit, the complication may be affected by approach type, in which the approach type is chosen depending on patient health. Thus, caring plan need to be changed to suit for each patient with different surgical methods (Schultz; Ewbank & Pandit, 2017). Other sides, with the surgery technique in each operation such as applying the modern anesthesia technique also affects to caring plan and caring skills (Schultz et al., 2017) (Walker, 2012). Structure of sub-categories and categories are listed at Table 5 at Index part.

Postoperative process - at this stage, risk management is particular important in any surgical procedure. This minimizes complications in postoperative caring. With the hip replacement surgery, regarding article from Mikyoung and Sue readmission’s rate was increased from 5.9% (in 1991) to 8.5% (in 2008) (Mikyoung & Sue, 2014) and the cost of those was 1.5 to 3.0 times more than an uncomplicated primary THR (Mikyoung & Sue, 2014). Thus, handling risk factors in this procedure in detail is needed completely that is collected with observation and observation of symptoms, tested parameters (Lee & Moorhead, 2014) (Walker, 2012). Belong of Joelsson and Olsson and Jakobsson told that pain level on leg or pain at wound area also need to be considered to avoid relative complications (Joelsson; Olsson & Jakobsson, 2010), and infection of bacteria might be cause of developing complications. Structure of sub-categories and categories in this stage are listed at Table 6 in Index part.

7.2 Theme 2 - Nursing Care

Nursing care are included caring skills, caring process with assessment of comorbidity condition that might be risk factors such as age, obesity, weak bone, or others, caring methods with contacting via discussion or education. And individual caring plan is necessary to built on each patient, at the same time sharing and friendly with patients in person to reduce anxiety or fear in operation, as well as assist patient with exercises or using supported equipment for moving exercises. Other sides, pain management also need to be assessed and have solutions in time through exercise properly, have enough knowledge of medicine and side effect to manage other complications from medication. One of needed skills was equally important is education through discussion and supplying information, as well as using various methods for caring progress.

Structured data at this theme which was collected from evidences with reference sources listing at Table 7 in Index part were summarized as figure below.

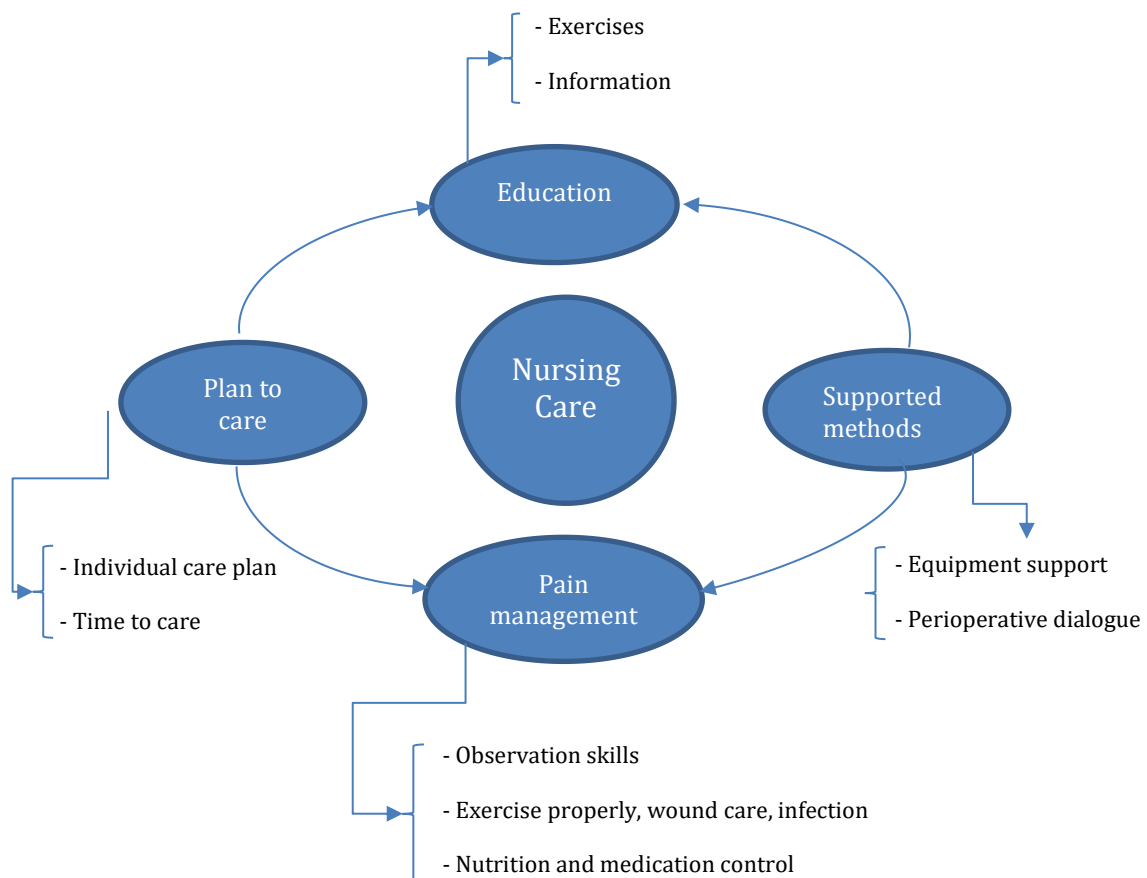


Figure 10 - Nursing care in recovery process

As theme 1 is listed some factors which may develop to severe complications harming for patients, then nursing care is particular important as role of caring for recovery process, as well as preventing against potential complications. The caring is able be either combination of interaction between nurse and patient; caring process including caring skills, pain control, or medication in recovery progress; methods directly or indirectly to minimize the complication through education, remote care or plans for discussion, interaction with patients and caring time on each case or even from collecting clinical recorded data, or from other tools (Lee & Moorhead, 2014).

Assisting of nurse with supported equipment such as the height of chairs, pillows, crutches, or exercises properly, or changing positions which need to help and education patients to self-care went well (Joelsson et al., 2010) (Walker, 2012).

Basing on chosen articles, caring skills and caring time are important factors of nursing intervention in recovery progress. Regarding Lee and Moorhead noted that “care plan, orthotics management, bathing, oral medication, elimination care and pain management were implemented most frequently on the first day and intensively provided on the 1st, 2nd, and 3rd days. Mobility care, teaching/emotional support, fall intervention, nutrition, vital sign check, incentive spirometry, and blood draw were provided more on 2nd, 3rd and 4th days than 1st day.” are summarized of nurse intervention in hospital stay (Lee & Moorhead, 2014). Also in this study mentioned that in period of hospital stay, the most of complications is pulmonary embolism which may occur within 4 first days (Lee & Moorhead, 2014). In the other article, nurse needs to check and document the signs of infection before surgery and after surgery such as “blood pressure, pulse, respiratory rate and oxygen saturation and temperature.”, also “monitor the signs of dehydration, shock or increased pain.” (Walker, 2012). Other intervention is equally important in recovery process is pain relief, pain affects to mobilization and time in hospital stay (Joelsson et al., 2010) (Schultz et al., 2017). Pain control was mentioned as the important factor in pain relief process. Nurse should focus on patient’s state during first 48 hours after surgery (Lee & Moorhead, 2014). Normally, patient’s pain come every 3 hours during this period of the first 48 hours (Joelsson et al., 2010). Thus, individual care for listening and sharing with patients to adjust exercises, nutrition or apply medication to release pain is necessary.

After surgery, pain relief is especially important during first postoperative days. There are vary combined methods to control the pain that were mentioned such as wound care, mobilized exercises of rehabilitation, other equipment support and medication (Joelsson et al, 2010). Also there are some other methods in pain relief “may include epidural analgesics, patient-controlled analgesia, I.V analgesics, and or analgesics” (Perkins, 2021). In addition, opioid therapy has considered as traditional pain management such as morphine, hydromorphone, oxycodone, hydrocodone and fentanyl during period of orthopedic surgery. However, this therapy causes shorter distance in walking, longer hospital stays, slower recovery, more complication which caused cost increasing (Gaffney; Pelt; Gililland & Peters, 2017). Also in this article, some other therapies are applied to control the pain such as multimodal pain management which controlling whole surgical process through out preoperative, intraoperative and postoperative techniques with education about pain control. Or cryotherapy with bag of ice or cooled water applying the skin of around wound that helps reducing blood lost and inflammation. Or medication therapy is applied such as paracetamol (Tylenol), nonsteroidal anti-inflammatory drugs and cyclooxygenase-2- inhibitors to prevent inflammation in which NSAIDs and COX-2 are applied for perioperative analgesia, as well as anticonvulsant such as pregabalin and fibromyalgia are applied for management of neuropathic pain and acute postoperative pain (Gaffney et al., 2017) (Bono et al, 2012). Meanwhile Tramadol has been applied for patients having pain levels from moderate to severe. Combination of Tramadol and acetaminophen to apply for acute pain treatment (Bono et al, 2012). However, nurses must have knowledge strongly about side effects of medication to follow complication and must be paid attention with inhibitors (Joelsson et al., 2010) (Gaffney et al., 2017).

Structure of sub-categories and categories in this theme are listed at Table 7 in Index part.

7.3 Theme 3 - Complication prevention

Complication prevention was mentioned with types of complication and own rate on each, also the signs to recognize those. The common complication was statistic with highest rate was dislocation, and lowest was bleeding. Articles also gave some solutions to prevent complication through by nursing skills, as well as using other channels for

supporting which easier to recognize the potential might be occurred such as reporting from clinical system, or even collecting information from self-report forms.

Structure of this theme are summarized as figure below.

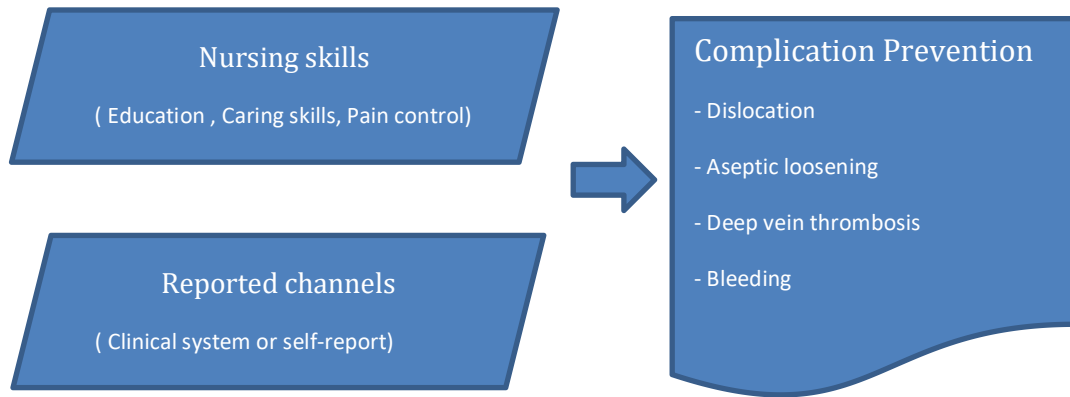


Figure 11 - Criteria condition for complication prevention

As some mentions above, the complication of total hip replacement often come from dislocation and deep venous thrombosis to patients which need to readmit. The complication may causes acute pain or event lead to death. Beside that, the cost affects to financial state and become economical burdens to patient's family. Therefore, prevention the complication is essential, especially caring tasks such as observation, care plan and care skills affects recovery process and hospitalization (Lee & Moorhead, 2014).

The handle and minimize risk of complications, nursing skills are important and necessary. By Lee & Moorhead, nurses must to have knowledge enough to education, also assist patients with rehabilitation exercise and caring properly (Lee & Moorhead, 2014). Through Schultz et al. mentioned that controlling pain and avoiding side effects in time helps reducing hospital stay (Schultz et al, 2017).

As evidences at Table 6, dislocation is highest risk of complication and can occur in any stage of lifetime. The most sign of dislocation is extremely pain, difficult to limb-length or rotate the leg. The surgical approach affects to hospitalized stay that can be from 1 to 5 days (Perkins, 2021). To prevent dislocation, anterior approach is a surgical method to minimize risk of dislocation and hip precaution need to be focused on in recovery process

(Schultz et al, 2017) (Perkins, 2021). In addition, nursing assist such as seated position in a chair, move to edge of bed, move to chair, and method of using toilet seat which support patients to ease pain and comfort in recovery process (Lee & Moorhead, 2014).

Regarding Greenbaum and Bornstein and Lyman and Alexiades and Westrich told that self-report helped nurses to collect data to build suitable individual plan for preventing complication occurred (Greenbaum; Bornstein; Lyman; Alexiades & Westrich, 2012). Also in Lee & Moorhead article said the clinical support from system help nurses who have to pay attention on patients with risk flags (Lee & Moorhead).

Structure of sub-categories and categories in this theme are listed at Table 8 in Index part.

8 Discussion

With the purpose of this study is to gain knowledge about nurse intervention in caring and prevent complications for patients who undergo total hip replacement by applying theory of “Nursing as caring - A model for Transforming Practice”, as well as selecting data by using method of narrative analysis from “Grounded theory”. The results are analyzed and synthesized basing on chosen articles which including some specific researches on each article go through preoperative, perioperative, and postoperative processes. Those issues are summarized such as risk factors of patients in admission process, caring of nurse in all processes, recognizing signs of potential complications and intervention by nurses timely, as well as supported methods to control pains and reduce the chance of complications occurring. The study found that nurse has important role in caring to prevent complications through his/her experiences, time consumption, and applying other supported tools.

The discussion is separated with two part that including Result discussion and Method discussion. With result discussion is mentioned as synthetic of analyzed results at Part 7, as well as how the found results response to the aim of thesis with 2 research question by applying “Nursing as caring” theory. Meanwhile method discussion is mentioned about how to take out suitable data approximately by using combination between method of Grounded theory with narrative data analyzing and “Nursing as caring” theory.

8.1 Result discussion

About forming subcategories belong of process of reading in detail, analyzing, noting and selecting with purpose for how to find out intervention of nurses in monitor and protect potential complications which might be occurred. Thus, the study is focus on finding solutions of supporting, assisting and caring patients in recovery process to prevent the complications happening.

Thanks to applying the theory “Nursing as caring” helps to figure out characteristics, the results are described by three themes including *Risk management*, *Nursing care*, and *Complication prevention*. Starting by recognizing risk factors of complications go through admission to discharge, adjusting caring plan timely is specially important to prevent complication. From there, nurse intervention impacts to recovery process directly through specified skills such as mobility care, pain relief, wound care, medication and side effects, nutrition and bathing, support tools, education and communication with patient to assist knowledge of rehabilitation by exercises, nutrition and support equipment at home after discharge. Beside that, using supported various methods in detecting progress to prevent the potential complications happening.

The results are found with oriented and structured categories and forming themes that response for aim of this study are presenting as diagram 1 in which structure of categories are listed in Index part (from Table 4 to Table 8).

Result discussion part is divided to separately discussion parts with:

- ✓ The detail of three themes are presented from part 8.1.1 to 8.1.3.
- ✓ Overall picture about nursing intervention in preventing complication through these 3 themes is discussed at part 8.1.4.
- ✓ In addition, the themes are found by applying theory of “Nursing as caring - A model for Transforming Practice” with nurse’s responsibly and human that is discussed in detail at part 8.1.5.

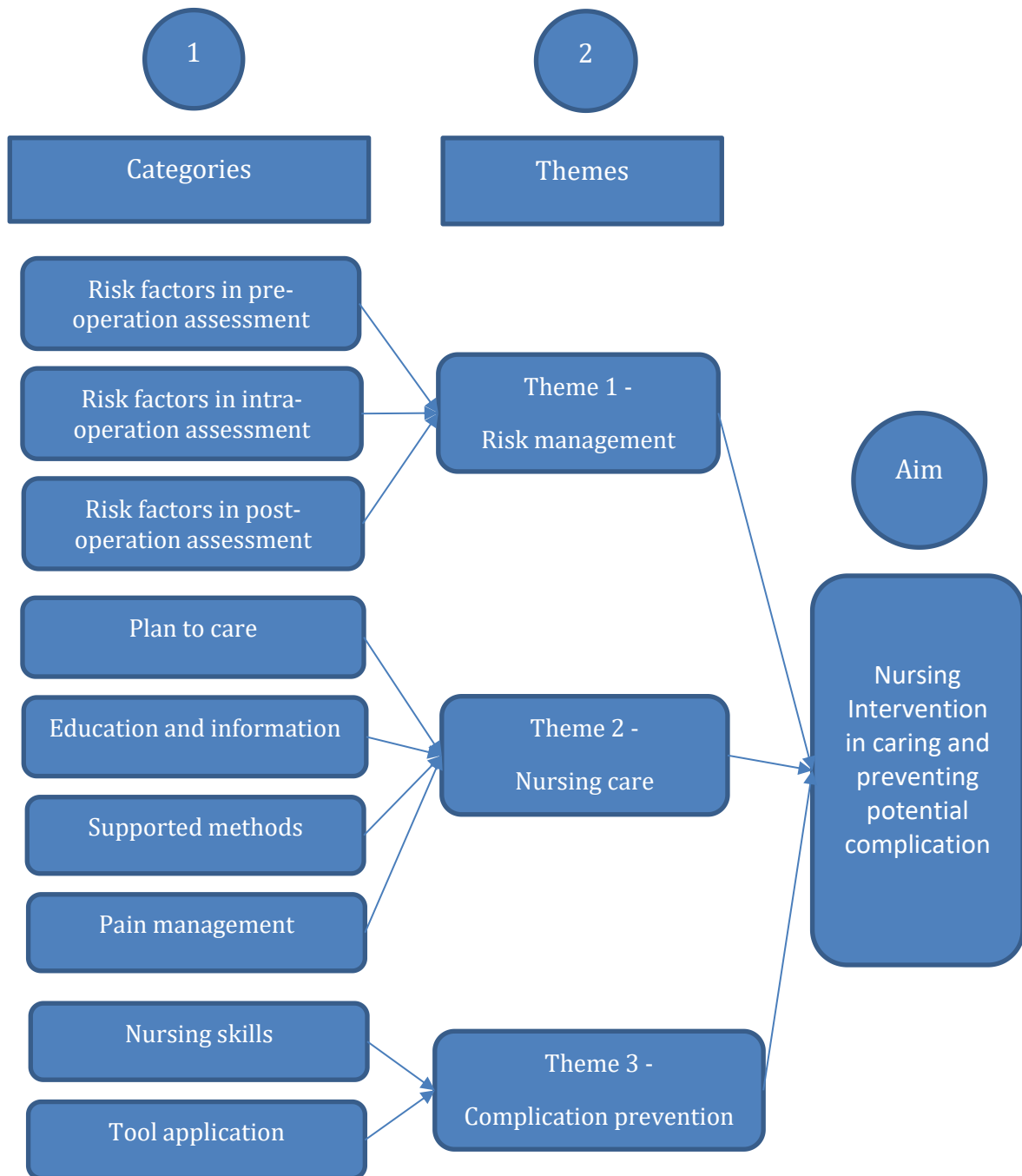


Diagram 1 - Overview structure of found results

Basing on chosen articles, through analyzing process, to care effectively, nurses need to clarify risk factors that might be causes of potential complication during hospital stay, also discharge stage as well. In recovery process, nursing intervention is especially important in caring, monitoring and prevent complications. In this stage, specific skills are required that need nursing intervention, also nursing time need to be consumed enough for caring. Additionally, whether if does using other tools help to monitor and prevent complications.

8.1.1 Theme 1 - Risk management

Complications might be occurred in whole surgical processes, including preoperative procedure, pre-operative procedure and postoperative procedure. Thus, risk management is necessary with observation and assessment properly. To manage risk effectively, risk factors were presented in chosen articles which are described as diagram below.

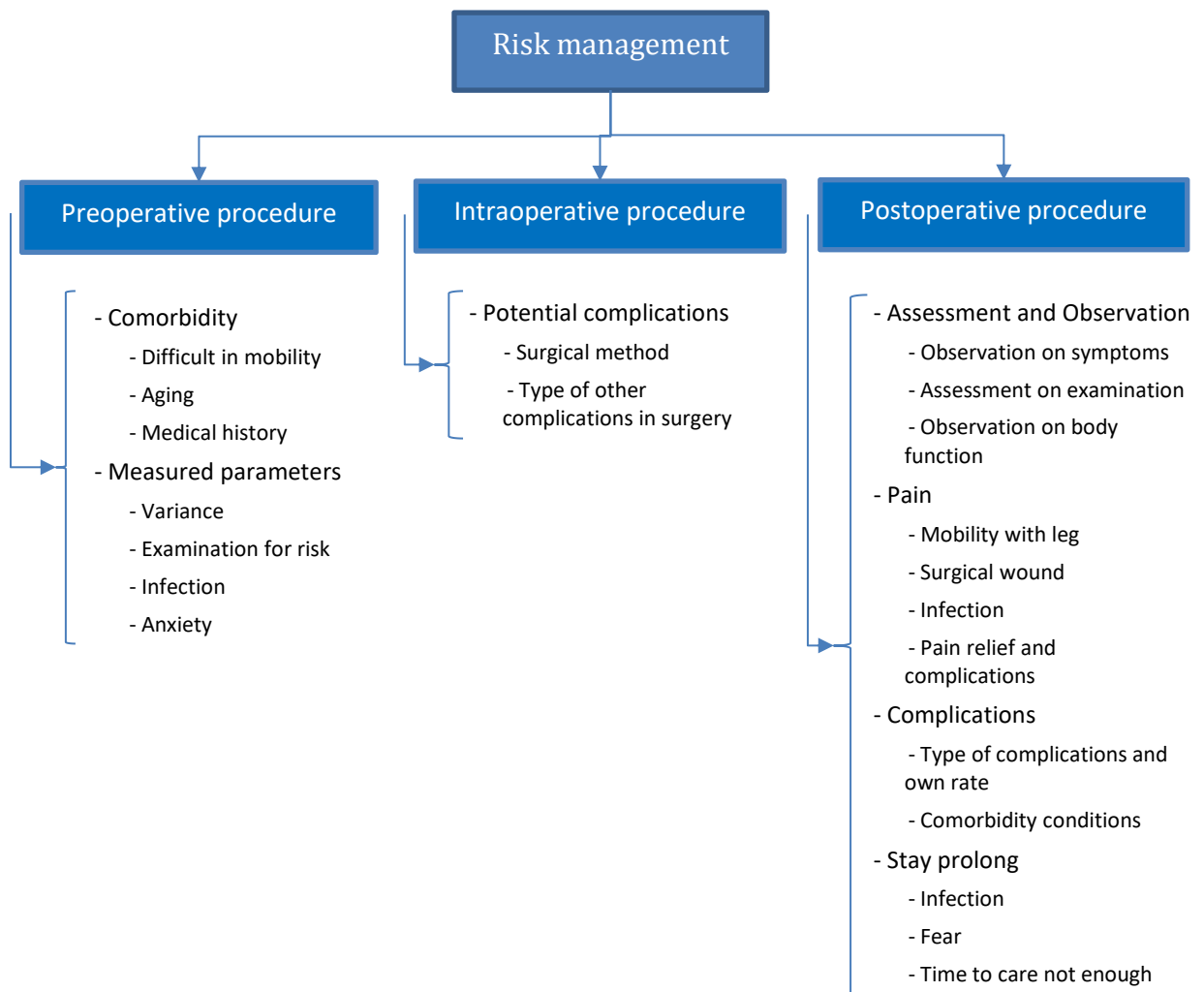


Diagram 2 - Risk factors through by surgical stages

In preoperative procedure, a patient who going to total hip replacement with problems of movement such as lack or loss of mobility functions, or had been osteoarthritis or osteoporosis which causes weakness of bones or muscles which were assessed as one of risk factors of complication (Walker, 2012) (Schultz et al., 2017) (Perkins, 2021). Older was considered as an other risk factor of complication with comorbidity often adding on (Lee & Moorhead, 2014). Beside that, medical history of patients such as diabetes, cardiac

arrhythmia and hypertension also were assessed as risk of potential complications as well (Walker, 2012). In this stage, risk was assessed through measurement such as parameters of examination including blood group, urine sample or blood pressure, pulse, respiratory rate, in which blood group was mentioned as important factor during surgical process if blood transfusion needed; bacteria's infection such as Staphylococcus as known as mostly (Perkins, 2021) (Walker, 2012); also extremely anxiety impacted to recovery process (Pulkkinen et al., 2015).

In pre-operative process, surgical method with cemented prostheses or metal types or approach types including anterior, posterior which necessary for paying attention to care (Walker, 2012) (Schultz et al., 2017); other sides risk of other complications such as "excessive bleeding, decubitus ulcer, delirium, neurovascular injuries, and ileus" were considered a risk factor of complication also (Lee & Moorhead, 2014).

In postoperative process, observation and assessment was key of risk management through patient symptoms of body functions, pain, examination's parameters, also rate of each type of complications were considered for monitoring potential complications (Lee & Moorhead, 2014); especially patients in pregnancy might be risk of venous thromboembolism (Greenbaum et al, 2012), as well as fallen with older (Lee & Moorhead, 2014); In addition, lack of consumption nursing time was told as high risk in caring which might be developed to complication and prolong hospital stay (Walker, 2012) (Lee & Moorhead, 2014). In this stage, pain was considered as a risk of complications that was figured out through mobility, wound, infection or come from other complications (Joelsson et al., 2010) (Perkins, 2021), as well as fear and anxiety were risk factors that might impacted to recovery capacity (Joelsson et al., 2010).

8.1.2 Theme 2 - Nursing Care

At this theme, nursing skills were figured out for caring patients in recovery process. Basing on chosen articles, they were listed belong of main categories which is summarized with diagram below.

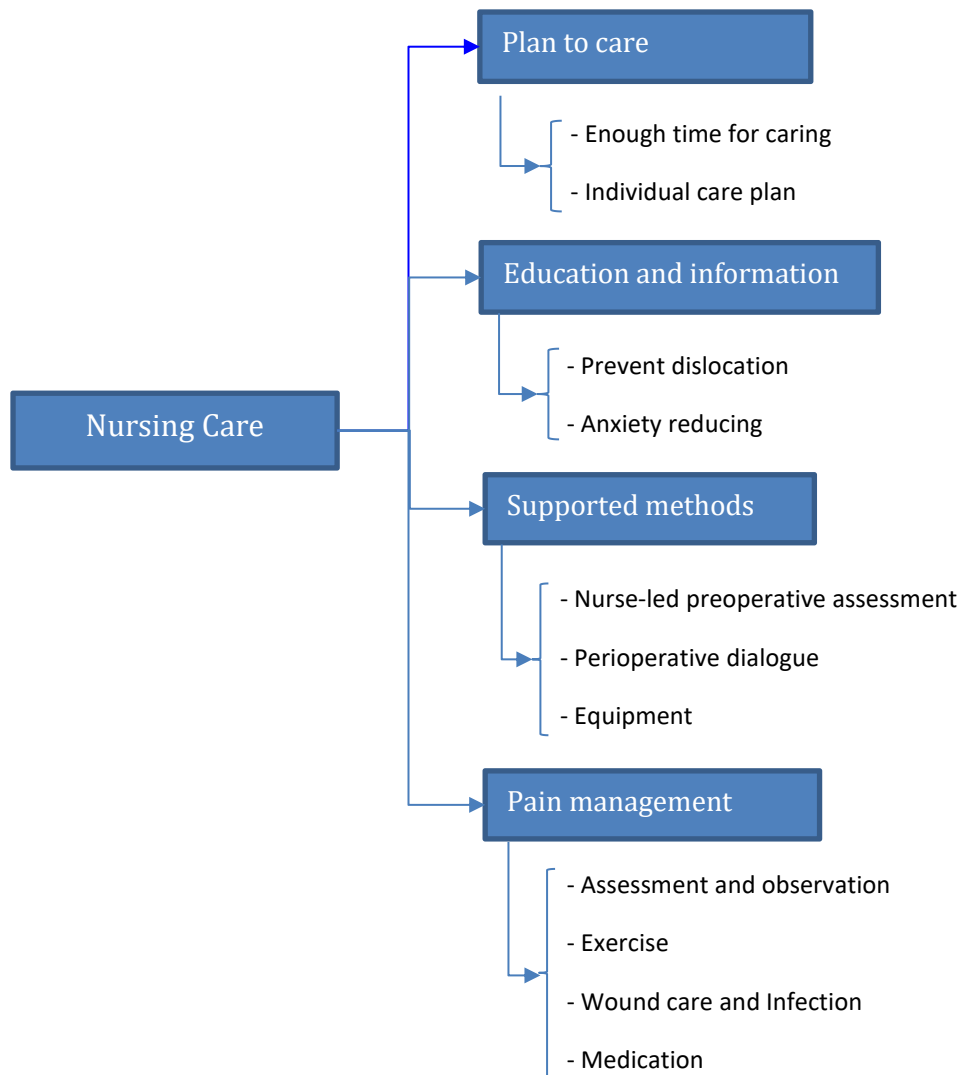


Diagram 3 - Nursing skills in recovery process

Nursing skills that needed to care patients with total hip replacement including making individual plan with discussion and assessment before, as well as total time to care on each case was especially important for recovery quickly and prevent complications in time (Lee & Moorhead, 2014) (Pulkkinen et al., 2015); to prevent potential complications and decreasing hospital stay of patient, education for patients about hip precautions was especially necessary to increasing self-preventing capacity out of complications; In particularly, supplying information enough to patient, as well as doing exercises and using other supported equipment such as chairs with suitable height level, raised toilet seat, abduction pillow or crutches, climbing stairs properly to avoid dislocation that was at the highest complication rate (Lee & Moorhead, 2014) (Pulkkinen et al., 2015) (Schultz et al., 2017). To be able to create good relationship and togetherness with patients in

supporting and getting to know patient information, using other tools such as nurse-led pre-operative assessment, or perioperation dialogue that were mentioned as useful methods in caring timely (Pulkkinen et al., 2015) (Schultz et al., 2017) (Walker, 2012).

The most important skill in nursing care that was known as pain management. To manage effectively, knowledge enough is needed to have assessment and observation correctly; at the same time assisting skill with rehabilitation exercises, caring skill in wound care and protecting infections were mentioned in chosen articles (Schultz et al., 2017) (Walker, 2012). And knowledge of medicine was equally important to control pain, also avoid side effects from combination of medicines as well (Joelsson et al., 2010).

8.1.3 Theme 3 - Complication prevention

This theme is considered as synthetic of risk assessment, observation capacity through by gait and posture or lower back pain in risk of dislocation (Perkins, 2021) or symptoms of deep vein thrombosis with oedema, tenderness or redness at the area (Walker, 2012) to have intervention correspondingly.

The diagram of this theme is described as below.

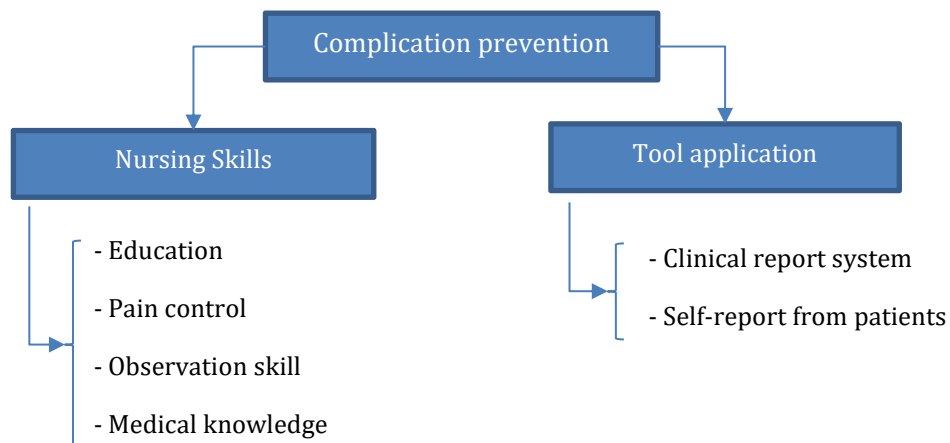


Diagram 4 - Methods for complication prevention

Combinations of nursing skills and supported tool application were mentioned in chosen articles for preventing of complications. Nursing skills were mentioned in detail at theme 2. By using other tools to support for detecting potential complications such as getting from alert of clinical report system with statistic collected data (Lee & Moorhead, 2014) or collecting date from patient's self-report (Greenbaum et al., 2012) (Schultz et al., 2017).

8.1.4 Overview of Nursing Intervention in Complications Prevention

Basing on analytic results with there themes above, nurse intervention for patient with total hip replacement to care and to prevent potential complications is described as overall diagram following.

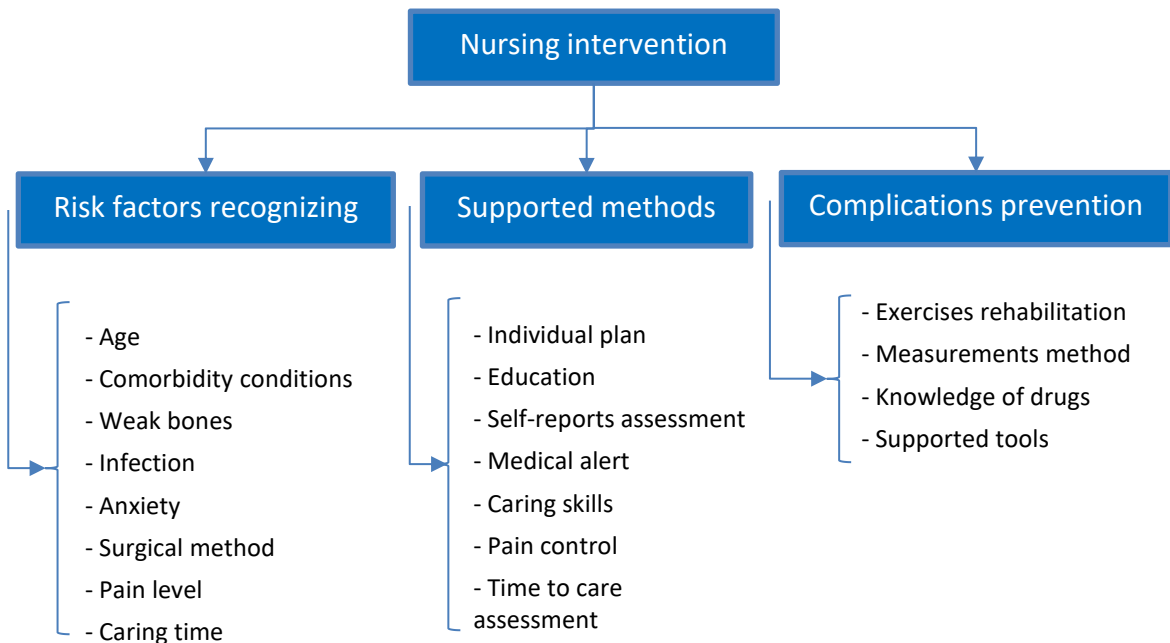


Diagram 5 - Overall diagram of Nursing Intervention in Complications Prevention

The recognizing of risk factors is important to adjust individual plan, discuss and supply information, educate patients, as well as spending time for taking care patients with pain management, wound care, bathing, medication and rehabilitation to aim reduce complications (Lee & Moorhead, 2014) (Schultz et al., 2017).

Symptoms such as “myocardial infarction, pulmonary embolism, deep vein thrombosis, pneumonia, dislocation, and surgical site infection” were reported as the most common complications with patients undergoing total hip replacement (Lee & Moorhead, 2014). For early detection of complications, nurses should monitor the symptoms such as “fever, chills, shaking, hives, back pain, chest pain, shortness of breath, nausea, and vomiting.” (Perkins, 2021).

Basing on chosen articles in this study, there are risk factors affecting to recovery process that expand hospitalized stay including age, comorbidity conditions, infection (Lee &

Moorhead, 2014) (Walker, 2012), weak born or immobility (Perkins, 2021), surgical approach (Schultz et al., 2017), emotional status (Joelsson et al., 2010), pain level (Walker, 2012) (Joelsson et al., 2010) and time consumption (Lee & Moorhead, 2014) in caring process. In which age and comorbidity conditions are highlighted factors in risk of complications (Lee & Moorhead, 2014) (Walker, 2012). Regarding Greenbaum et al., the risk of women older than 65 years was specific described as 95.6% of complications basing on their studies with selected data from self-report and medical records (Greenbaum et al., 2012). Another article from Walker mentioned that patients with comorbidity conditions such as obesity, heart failure, or history of patient or his/her relative in family was in VTE that need to be considered as risk factors of VTE complications after surgery. Also in this article, infection in surgery process also need to concerned, prophylactic IV antibiotics are suggested to apply to reduce the risk of infection in surgical process (Walker, 2012) (Perkins, 2021). Particularly, patients with lung's problems or in pregnancy period are especially concerned in surgery process. Nurse should care about airway, as well as breathing to prevent pneumonia or respiratory complication after surgery (Lee & Moorhead, 2014). Beside that, pain assessment is also suggested as parameter need to be documented to detect and prevent potential complications after surgery such as DVT and respiratory infection. Prolong pain may increase mortality and morbidity rate. Pain level can be affected by movement, thus mobilized ease is applied to relief pain (Walker, 2012). With patients who has weak bones and have poor balance are to fall easily and may develop to hardware loosening, and revision is solution for these patients (Perkins, 2021). With these cases nurse needs spend more time to have specific individual plan with nurse's assist and equipment's supports. One of risk factors of complication was defined is surgical approach. Specially, posterior approach may cause dislocation (Perkins, 2021), even this is up to six times compare with anterior approach (Schultz et al., 2017). To prevent dislocation, nurse should care about hip precaution that patients not bending over past 90° to heal the tissue softer (Schultz et al., 2017) (Perkin, 2021). An objective reason is equally important in risk is time to care patients, in the article of Lee and Moorhead, the results was proposed that a nurse should spend 2 hours and 36 minutes per a THR patient in a his/her shift (Lee & Moorhead, 2014). Thus, the complication may develop when there is not enough time of nursing intervention. Other consideration about patient's emotion, patients face to fear

and anxiety in perioperative process, nurses need to support patients' feel with comfortably and securely (Pulkkinen et al., 2015).

In the preoperative process, a discussion between nurse with patient to know each other, nurse needs to have "friendship", understanding anxiety and fear of patients and supply enough information to assist and to comfort the patient. From there, nurse builds individual care plan for patient (Pulkkinen et al., 2015). The care plan of each patient basing on assessment of patient's state including comorbidity, history of illness or relative's diseases, emotions through discussion at perioperative process. Also in this stage, perioperative education for patients is especially important to discuss individual plan with exercises or walk with crutches and some other affected activities such as toilet seat, bedpan, risk of fall (Perkins, 2021).

The complications often occur during postoperative period. Especially pulmonary embolism (PE) may come within 4 days after surgery (Lee & Moorhead, 2014). Nurse must monitor symptoms of PE, or parameter of positive computed tomographic scan or changing from chemical anticoagulation depending on patient's state. One of complication often occur with 40% of patients undergoing orthopaedic procedures is venous thromboembolism, to protect this complication patients often have been applied a method of combination of anticoagulant therapy including low molecular weight heparin, anti-embolic stockings or intermittent pneumatic compression (Walker, 2012). With patients in pregnancy, especially they need to be concerned about the possibility of venous thromboembolism. To prevent deep vein thrombosis, nurse should monitor parameter of lower ultrasound or changing in chemical anticoagulation (Greenbaum et al., 2012). In addition, patients with thinner bone may cause loosening after implant surgery, the symptoms often were reported with pain and feeling unstable with hip (Perkins, 2021).

Different from various complications mentioned above, dislocation is considered seriously as the most common of THA complication (Lee & Moorhead, 2014), the rate of dislocation is highest (Greenbaum et al., 2012). Almost common signs of dislocation is extremely pain. Risk of dislocation may come from fall and mobility care because they impact to nervous musculoskeletal system (Lee & Moorhead, 2014). To protect from dislocation, care plan,

exercises rehabilitation, pain relief, medication and nutrition are considered to be factors consuming the most time in postoperative period. After surgery, every 2 hours nurse must to check parameters of intensive monitoring that including intensive circulatory vascular and motor-sensation (Lee & Moorhead, 2014). In recovery process, protection of dislocation is important. At this stage, mobility care must be paid closely attention, in which particularly pain relief and hip precautions are common signs to assess capacity of complication (Schultz et al., 2017) (Perkins, 2021). To protect the dislocation, education for patient about motoring exercises with not bending over 90 degrees is necessary, patient should avoid adduction and hyperflexion. As well as using supported equipment such as pillows, splints, and wedges to keep positioning the patient safety and comfort in walk, especially signs of hip precaution, risk of fall, conditions of toilet seat, climb-stair, bathing or in bed (Perkins, 2021).

Pain management is particularly important in recovery process. Pain levels can be assessed directly by patient's report or through assessment form observation of changing of gait and posture or movement difficulty (Perkins, 2021). To control pain, nurse needs to use some other supports such as pillows, moving sheets, bedpan to ease pain, as well as applying medication to relief pain such as NSAIDs that suitable for older patients in short-term, Tramadol be applied for patients with minimal relief, or combination of Tramadol and Acetaminophen often use for acute pain. Other case, Acetaminophen is considered to apply for patients with musculoskeletal pain, or Opioids can be applied for short-term to control pain during preoperative period. After surgery, paracetamol are often used, possible to combine with dextropropofol or tramadol to relief pain (Joelsson et al., 2010). However, applied medication should be focused on side effects or contraindication in combination of comorbidity diseases, for example using NSAIDs may increase risk of bleeding and peptic ulcer disease, or side effects of Opioids such as "nausea, vomiting, drowsiness, and constipation". Beside that, using high dose of Acetaminophen or NSAIDs may increase risk of cardiovascular events, also nurse should pay attention when applying Acetaminophen for patients with liver or kidney disease (Bono et al., 2012). During surgical process, pain control is often used with "epidural analgesics, patient-controlled analgesia, I.V analgesics, and/or oral analgesics" (Perkins, 2021). Nurse should focus on patient's state during first 48 hours after surgery (Lee & Moorhead, 2014). Normally, patient's pain come every 3 hours during this period of the

first 48 hours (Joelsson et al., 2010). To monitor the patient's pain, nurse needs to check effective delivery of medication for patient's pain (Walker, 2012). Moreover, nutrition also is equally important in recovery process after surgery, nurses should have discussion with patients to support recovery process quickly. Nutrition was considered a factor of nurse intervention which consumes time of nurse in surgical process (Lee & Moorhead, 2014).

Exception, there are some other complications such as pneumonia, urinary infection, chest pain, medication errors (Lee & Moorhead, 2014). Further more, wound infection that may result of applying anterior approach with patients has thinner skin and poor wound care. Higher risk of wound infection for patients with diabetes mellitus, female patients, and obese patients with anterior approach. Therefore, to prevent wound complication, dressing change with sterile conditions should be applied. Moreover, dressing change need to be monitored with diabetes patients who have prolong length of wound healing process (Schultz et al., 2017). Beside that, bleeding is considered as a potential complication, it is expressed like circled shadow of bleeding in dressing. Nurse should monitor the date and time of continued bleeding, as well as paying attention to hemoglobin and hematocrit levels (Perkins, 2021).

For supporting nurse in caring for patients, some methods are used to collect information in protect to aim preventing complication such as perioperative dialogue to aim preventing risk of complications with patient's history regarding to diseases or comorbidity, also sharing and supplying information to patients to release fear to face before surgery (Pulkkinen et al., 2015), assessment of report directly with pain levels to monitor medication effects, from there nurse changes medication if necessary (Schultz et al., 2017). In which, education and discussion are particularly important to support patients about how to walk or movement after surgery to prevent the complications (Perkins, 2021) (Walker, 2012). Other method to measure short-term complications by self-report by survey with questionnaire to aim analyzing and statistic rate of complications after discharge (Greenbaund et al., 2014). Beside that, at UK, nurse-led virtual clinics with questionnaire is considered as a solution for caring to aim minimal interruption during the first 2 postoperative months and to reduce the cost because of revision (Schultz et al., 2017).

8.1.5 “Nursing as caring” theory application on the found results

The results of this study are taken out by applying the “Nursing as caring - A model for Transforming Practice” theory of Dr Boykin A. and Dr Scheonhofer S.O which are collated with six assumed concepts including “group of Caring person”, “group of Personhood” and “Nursing is discipline and profession”. The comparison is described as diagram below.

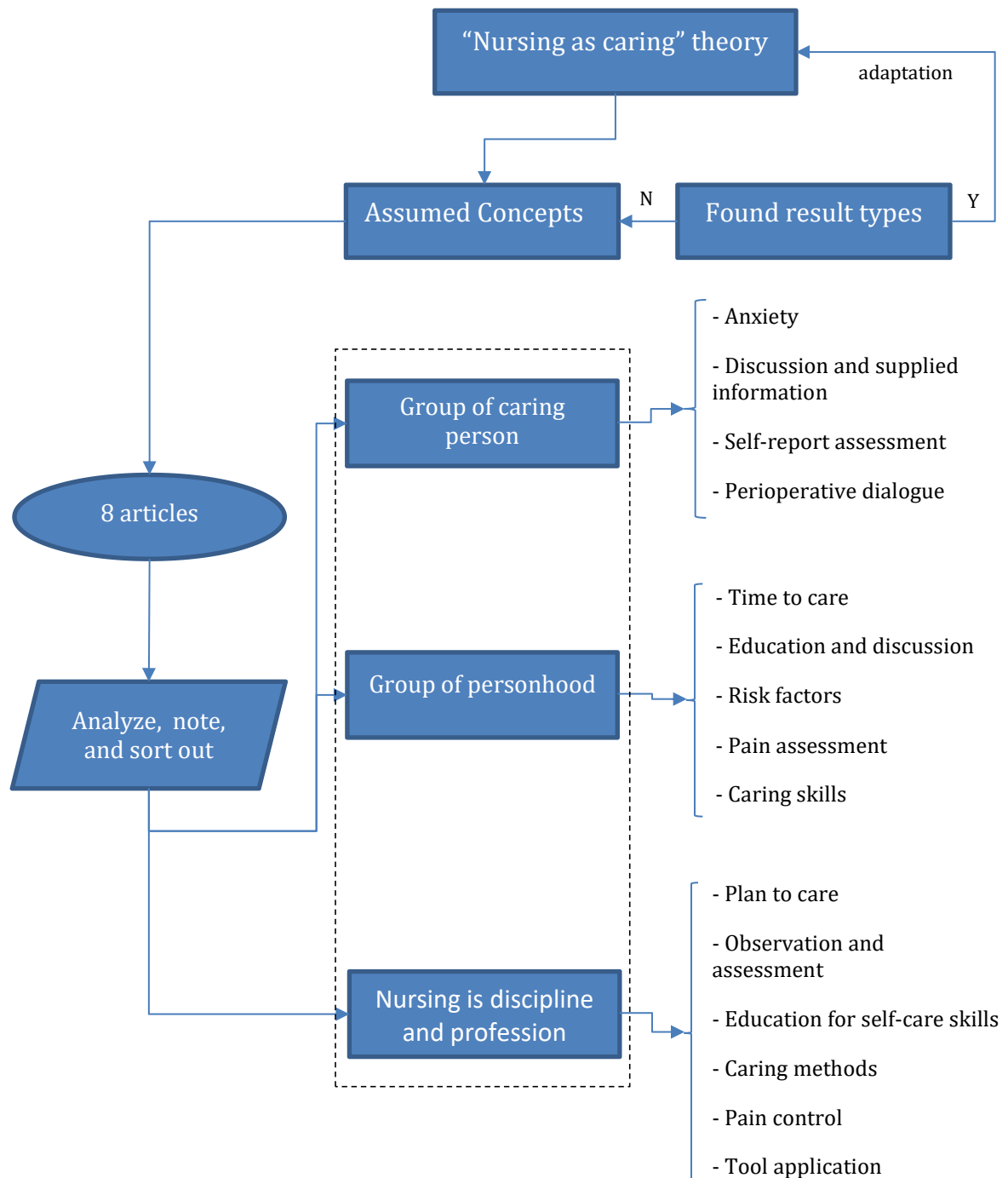


Diagram 6 - The comparison between found results and theory of “Nursing as theory”

The theory is applied in analyzing progress which concepts of caring person, personhood are focused. The study are figured out risk factors to make individual plan and intervention timely with nursing skills needed which adapt with caring person concept of the theory in caring with moment to moment; Also caring in friendly, give information, discussion and education, or using other methods such as in nurse-led preoperative assessment or perioperative dialogue for sharing to know each other. From there, creating a good relationship to reduce fear or anxiety of patients in surgical processes which are adapted with personhood concept of the theory. In addition, with nursing skills and knowledge about medicine, also collected data from clinical system in complication management, supplying information and education for patients to reduce potential complications occurred, also to decrease hospital stay as well which are fitted in concept of nursing discipline and profession completely. Thus, this study is fully adapted to the aim of this study by applying the theory of “Nursing as caring - A model for Transforming Practice”.

8.2 Method discussion

In data analysis process, the Grounded theory methodology is applied on 8 chosen articles that consist of answers to 2 research questions to find out approximately data.

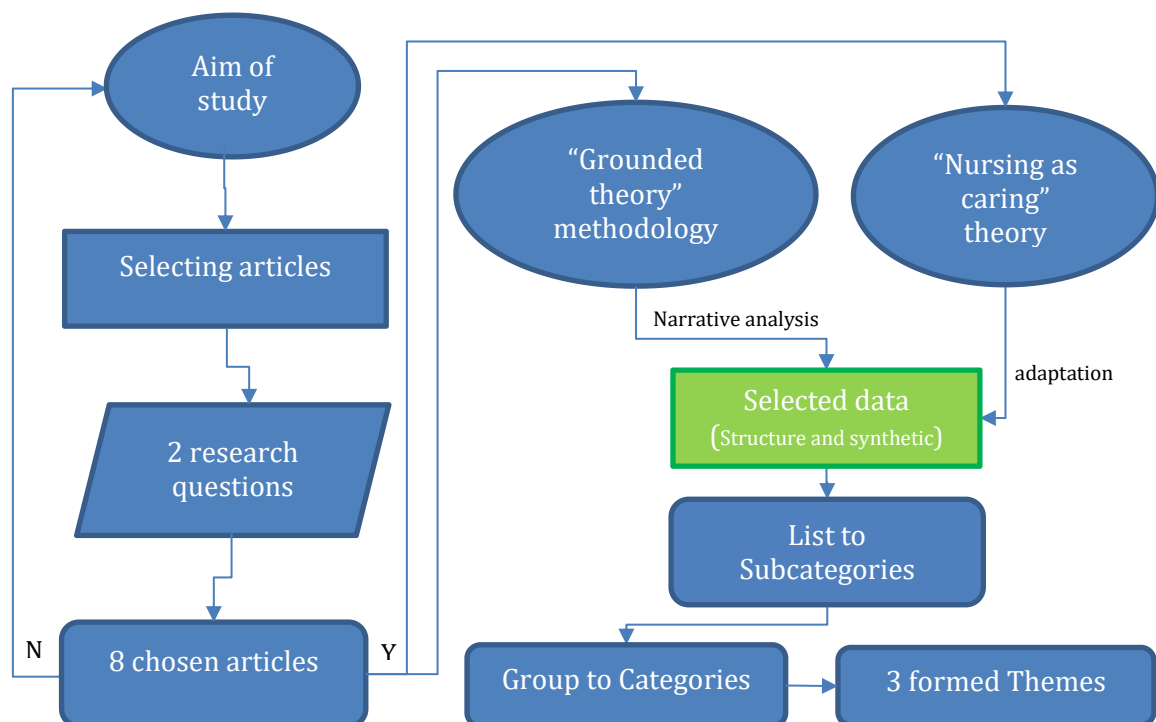


Diagram 7 - Data selection by applying method of Grounded theory

With this method, data is collected by narrative analyzing and to aim for replying on research questions. All of data are taken that are belong of characteristic type that suitable and adapt with aim of this study which went through two filters with “Grounded theory” method and “Nursing as Caring” theory. Later then, list of selected data are structured and synthetic to subcategories that they are belong of. From there, grouping subcategories to main categories are more clearly, as well as forming themes are structured from these main categories.

Thus, Themes, Categories, Sub-categories consist of contents from data analysis that are adapted fully to the aim of study.

By using narrative data analyzing, the collected results did not mention much about neither the specific actions of nurse in intervention of monitor and managing on every specific complication nor methods to minimize risk on each which were not relevant to the aim of study.

9 Conclusion

As mentioned complications above, dislocation is almost common complication after total hip replacement. Cost of admission or revision is an issue, thus, to minimize risk of this complication, nurses need to especially focus on caring and assist patients with specific exercises and detecting signs of complication in early stage avoids the complication occurring. To manage effectively of this complication, nurses need to have experiences, also time enough to supply information, discussion, and to adjust care plan correspondingly. And this consumes much time while nurse resources is shortage. Therefore, in this study, with individual opinion whether if does clinical system help to manage signs and risk of potential complication to support experiences for a new nurse through suggestions to make care plan and per cent of complication may occur through system?

The solution is described following.

When an OA patient admit, some parameters will be put into system including current patient’s status such as pain levels, gender, age, pregnancy, weak bone status and

comorbidity with selection of obesity, diabetes mellitus, kidney, liver or others, medication status, also allergy status, ect. After a care day, patient's state should be updated into the system, and system should list same cases with percent risk of complication through checked risk parameters. And on each caring stage, system should recommend the tasks will be and nurses can pick up tasks to build or adjust care plan. On each case, system should show percent of complication currently and variation of complication percentage. System should mark of high risk alert to group who are handling the case, group members can raise the issue and have discussions on that case. As well as system should show cases matching with same risks in the past, and nurse can refer tasks in next step and parameters need to handle until fully recovery.

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11 Appendix

11.1 Figures

Figure 1 - Anatomy of the hip joint

Figure 2 - Illustration of total hip replacement components

Figure 3 - Total hip dislocation. The ball has come out of the socket

Figure 4 - Collecting articles basing on common criteria

Figure 5 - Address materials that mentioning the subject correspondingly

Figure 6 - Finding the newest materials in 10 years

Figure 7 - Material selection that are used in the study

Figure 8 - Formed results from analyzing process with chosen articles

Figure 9 - Risk factors in surgical process

Figure 10 - Nursing care in recovery process

Figure 11 - Criteria condition for complication prevention

11.2 Table

Table 1 - Diagnostic Clues in Hip pain

(From Table 2 to Table 8 , their contents are presented at Index part)

Table 2 - Main materials are used in study

Table 3 - Core of analysis with chosen articles

Table 4 - Risk factors at pre-operative stages

Table 5 - Risk factors at intra-operative stage

Table 6 - Risk factors at postoperative stage

Table 7 - Nursing Care in recovery process

Table 8 - Criteria condition for complication prevention

Table 9 - About chosen articles

11.3 Diagram

Diagram 1 - Overviews structure of found results

Diagram 2 - Risk factors through by surgical stages

Diagram 3 - Nursing skills in recovery process

Diagram 4 - Methods for complication prevention

Diagram 5 - Overall diagram of Nursing Intervention in Complications Prevention

Diagram 6 - The comparison between found results and theory of "Nursing as theory"

Diagram 7 - Data selection by applying method of Grounded theory

11.4 Index

Table 2 - Main materials are used in study

<i>Title</i>	<i>Author</i>	<i>To use</i>	<i>Type</i>
100 Questions and Answers about Hip Replacement	Stuart J.Fischer, 2011	Background	Book
Complications after Primary Total Hip Arthroplasty (A comprehensive Clinical Guide)	Matthew P.Abdel, Craig J.Della Valle, 2017	Background	Book
Orthopedic physical assessment	David J. Magee, 2008	Background	Book
The Well-Cemented Total Hip Arthroplasty (Theory and Practice)	Steffen J.Breusch, Henrik Malchau, 2005	Background	Book
Total Hip Replacement	M.Postel, M.Kerboul, J.Evrard, J.P.Courpied, 1987	Background	Book
Total Hip Replacement (Case series from a leading registry)	Kalliopi Lampropoulou, Adamidou, George Hartofilakidis, 2017	Background	Book
Total hip and total knee replacement: postoperative nursing management	Brian Lucas, 2008	Background	Article
Revision Total Hip and Total Knee Arthroplasty	Janie T.Best, 2005	Background	Article
The validity of self-report as a technique for measuring short-term complications after total hip arthroplasty in a joint replacement	Jordan N.Greenbaum, Lindsey J.Bornstein, Stephen Lyman, Michael M. Alexiades, Geoffrey	Analysis	Article

registry	H.Westrich; 2012		
Changing practice for hip arthroplasty and its complications	Katherine Schultz, Meiling Ewbank and Hemant G Pandit; 2017	Analysis	Article
Total hip replacement explained	Amanda Perkins, 2021	Analysis	Article
The perioperative dialogue - a model of caring for the patient understanding a hip or a knee replacement surgery under spinal anaesthesia	Maria Pulkkinen, Kristiina Junttila, Lillemor Lindwall; 2015	Analysis	Article
Nursing Care patterns for patients receiving Total Hip Replacements	Mikyoung Lee, Sue Moorhead; 2014	Analysis	Article
Care of patients undergoing joint replacement	Jennie.Walker; 2012	Analysis	Article
Patients' experience of pain and pain relief following hip replacement surgery	Maud Joelsson; Lars-Eric Olsson and Eva Jakobsson, 2010	Analysis	Article
Pharmacologic pain management before and after Total Joint Replacement of the Hip and Knee	James V.Bono, Claire E.Robbins, Abdel K.Mehio, Mehran Aghazadeh, Carl T.Talmo; 2012	Analysis	Article

Table 3 - Core of analysis with chosen articles

No.	Article Title	Core of analysis
1	The validity of self-report as a technique for measuring short-term complications after total hip arthroplasty in a joint replacement registry	<ul style="list-style-type: none"> - Caring process - Caring methods - Complication rate
2	Changing practice for hip arthroplasty and its complications	<ul style="list-style-type: none"> - Risk factors - Caring methods - Complication management
3	Total hip replacement explained	<ul style="list-style-type: none"> - Risk factors - Caring process - Caring methods - Caring skills
4	The perioperative dialogue - a model of caring for the patient understanding a hip or a knee replacement surgery under spinal anaesthesia	<ul style="list-style-type: none"> - Caring methods - Complication management
5	Nursing Care patterns for patients receiving Total Hip Replacements	<ul style="list-style-type: none"> - Risk factors - Caring methods - Caring skills - Complication management
6	Care of patients undergoing joint replacement	<ul style="list-style-type: none"> - Risk factors - Caring process - Caring methods - Caring skills
7	Patients' experience of pain and pain relief following hip replacement surgery	<ul style="list-style-type: none"> - Caring skills - Pain management - Complication management

8	Pharmacologic pain management before and after Total Joint Replacement of the Hip and Knee	<ul style="list-style-type: none">- Caring skills- Pain management- Complication management
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Table 4 - Risk factors at pre-operative stage

<i>Main category</i>	<i>Sub-category</i>	<i>From articles</i>
Comorbidity	Difficult mobility	<ul style="list-style-type: none"> - Lack or loss of mobility functions, muscle feel like weakness and disability increasing (Walker, 2012) - There was around 90% of patients went to THA who had been osteoarthritis with feeling pain at the joints and difficult in mobility. (Schultz et al., 2017) - Osteoporosis cause bones weakness and difficult in daily activities. (Perkins, 2021)
	Aging easy get more other comorbidity	- Comorbidity condition often is added with older patients. (Lee & Moorhead, 2014)
	Medical history	<ul style="list-style-type: none"> - Patients with more comorbidity conditions were easy to get more complication and prolong hospital stay. Thus needed to have nursing interventions timely. (Lee & Moorhead, 2014) - Need to manage and prevent some complication might be developed for patients with diabetes, cardiac arrhythmia and hypertension. (Walker, 2012)
Measured parameters	Difference of before and after surgery	- Making some comparison of vital parameters before and after operation including blood pressure, pulse, respiratory rate and oxygen saturation. Thus, nurse need to document those

		parameters before and after surgery. (Walker, 2012)
	Parameters of examination	<p>- Doing blood tests such as blood group or cross-matching, urine sample and relevant microbiological such as methicillin-resistant in surgical process. (Walker, 2012)</p> <p>- To safety, perhaps patient need to provide a blood donation during surgical process when needed for blood transfusion. (Perkins, 2021)</p>
	Infection	- Necessary to carry out Staphylococcus aureus during preoperative assessment. (Walker, 2012)
	Anxiety	- Patients face to fear and anxiety during perioperative and nurse need to care and support them to ease their worries about, also to comfort them. (Pulkkinen et al., 2015)

Table 5 - Risk factors at intra-operative stage

<i>Main category</i>	<i>Sub-category</i>	<i>From articles</i>
Pay attention	Surgical method	<ul style="list-style-type: none"> - With patients aged 70 or over, cemented prostheses has lowest revision rates, and metal with metal types of replacement has highest rates. (Walker, 2012) - Nursing staff need to have differ perioperative care when changing technology belong to type of hip implant used. (Schultz et al.,2017)
	Complications	<ul style="list-style-type: none"> - Necessary to mention with perioperative complications such as excessive bleeding, decubitus ulcer, delirium, neurovascular injuries, and ileus. (Lee & Moorhead, 2014) - Patients with lung's problems or in pregnancy period are especially concerned in surgery process (Lee & Moorhead, 2014)

Table 6 - Risk factors at postoperative stage

<i>Main category</i>	<i>Sub-category</i>	<i>From articles</i>
Assessment and observation	Observation on symptoms	- Patients after surgery need nursing intervention with pain management, nausea/vomiting control, bowel regimen, turning, positioning, transfer, and ambulation. (Lee & Moorhead, 2014)
	Assessment on examination	- Parameters need to observe frequently after surgery such as blood pressure, pulse, respiratory rate, oxygen saturation as well as body's temperature. Particularly to monitor the signs of dehydration, shock or pain increasing. (Walker, 2012)
	Observation of body functions	- Frequently observation on neurovascular of the limb about "colour, warmth, sensation, movement and pedal pulses" to identify whether functions decreasing of circulation or neurologically. (Walker, 2012)
Pain	Mobility with leg	- Assessing pain's level and its increasing throughout activities at bed such as lift-up the leg, change position or turn outwards the leg from prone position. (Joelsson et al., 2010)
	Surgical wound	- Pain's level of the surgical wound which is known to be intense, but in limited time. (Joelsson et al., 2010)
	Infection	- Infection of prosthetic joint might cause severe pain, loss of mobility, also

		psychological problems, or social isolation. (Perkins, 2021)
	Pain relief and complications	- Risk of postoperative complication might be assessed throughout pain relief. Pain relief with greater ease decrease risk of complications such as deep ven thrombosis (DVT) and respiratory infection. (Walker, 2012)
Complications	Type of complications and own rates	<p>- Some complications with differ rate to care such as urinary complication with 10%. (Lee & Moorhead, 2014)</p> <p>- Basing on self-report of patients, the rate of complications were synthesized such as 81.1% of dislocation; 73.7% of fracture, 69.7% of deep venous thrombosis; 32.0% of major bleeding; any 8.0% of bleeding; the complications of PE and dislocation were high and major bleeding was low. (Greenbaum et al, 2012)</p> <p>- Basing clinical record with venous thromboembolism during pregnancy, complication rate of PPV is only 39%. (Greenbaum et al, 2012)</p> <p>- Complications of nervous / musculoskeletal system (7%), and fall incidents impact to caring about mobility, also fall intervention as well. (Lee & Moorhead, 2014)</p>
	Comorbidity	- Patients with aging or comorbidity added

	conditions	<p>might be increased significantly complication of VTE (venous thromboembolism). Beside that, risk of complication of VTE is needed to monitor with patients who are in obesity, respiratory failure or history of family's member with VTE. (Walker, 2012)</p> <p>- Risk of wound's complication is especially increased with patients who are female, or with comorbidity such as diabetes mellitus, the obese and morbidly obese. (Schultz et al, 2017)</p>
Stay prolong	Infection	- Infection prolong hospital stays, in some cases of deep infection it might be needed to remove the prosthesis to resolve the infection. (Walker, 2012)
	Fear	<p>- Fear might increases pain and effect to mobilisation. (Joelsson et al., 2010)</p> <p>- Patients supposed that fear of pain would be decreased when having staff with good behaviors such as "friendly" or "helpful". (Joelsson et al., 2010)</p>
	Time to care not enough	- The different of each intervention impact to nurse time consumption. (Lee & Moorhead, 2014)

Table 7 - Nursing Care in recovery process

<i>Main category</i>	<i>Sub-category</i>	<i>From article</i>
Plan to care	Enough time for caring	- Basing calculation of caring time, nursing hours per day for patients with THR were 7.87, it was calculated correspondingly with 32.5% of 24 hours and 48.7% of the day excluding sleeping time. (Lee & Moorhead, 2014)
	Individual care plan	- By nurse's point of view, necessary to have peri-operative dialogue with patients to aim supply information about care plan, also to share to know each other. (Pulkkinen et al., 2015)
Education and information	Prevent dislocation	- Education and assistance for patients are necessary for preventing dislocation in recovery progress. (Lee & Moorhead, 2014)
	Anxiety reducing	- Providing enough information to patients about practise skills, pain relief, or rehabilitation's exercises post-operation, also do asking some question before surgery reduces anxiety of patients. (Walker, 2012) - Supporting by give information, discussion and give advance before surgery from nurse for patients help them decrease anxiety and face during operation. (Pulkkinen et al., 2015) - Having good interaction between nurse

		staff and patients increase recovery of patients. (Schultz et al., 2017)
Supported methods	Nurse-led pre-operative assessment	- Nurse-led pre-operative assessment was used to discuss about surgery and raise something need to concerned with patients and their family. (Walker, 2012)
	Perioperative dialogue	- Presence of nurse timely in care creates good relationship and togetherness with patients. (Pulkkinen et al., 2015) - Phone call from nursing staff helps patient's satisfaction, as well as supply fully understanding of surgery and treatment in recovery progress. (Schultz et al., 2017)
	Equipments	- Supporting of equipment at home in recovery stage in mobility or rest such as the height of chairs and how to get easy when using toilet or using crutches for mobility or climbing stair. (Walker, 2012) - Using different pillows for sleep better. (Joelsson et al., 2010) - Change suitable positions such as lying down, lying on the side or pillow between the legs. (Schultz et al., 2017)
Pain management	Assessment and observation	- Monitoring effectiveness of analgesia in early stage of post-operation by pain assessment and patient controlled analgesia checking, effectiveness of

		<p>epidurals. (Walker, 2012)</p> <p>- Considering symptoms of weakness and neuro-pathic pain as sciatic nerve palsy might be results of patients. (Schultz et al., 2017)</p>
	Exercises	<p>- Movement helps recovery quickly. However, need to have right exercises to prevent dislocation, also prevent pooling in calf muscle such as the rotation flexion and extension of the ankle to support venous return. (Walker, 2012)</p> <p>- Necessary to have training exercises to prevent complication after surgery and to optimal mobilization. (Joelsson et al., 2010)</p>
	Wound care and infection	<p>- Dressing with sterile condition aims to prevent wound complications. And keeping dry and cleaning at the inguinal crease reduce postoperative infection. (Schultz et al., 2017)</p> <p>- Higher risk of wound infection for patients with diabetes mellitus, female patients, and obese patients with anterior approach (Schultz et al., 2017)</p>
	Medication	<p>- Important to reduce the peaks of intense pain by using medication, and pain management after that. (Joelsson et al., 2010)</p> <p>- Using pain medication to optimal pain</p>

		<p>management in joint replacement surgery. Beside that medication to avoid joint stiffness helps mobility smoothly. (Bono et al, 2012)</p> <p>- Pain relief methods are various. Normally using a spinal anaesthetic or local anaesthetic with periarticular infiltration and combine with other various medication such as paracetamol, tramadol, and NSAIDs and COX-2 inhibitors to release pain. (Schultz et al., 2017)</p> <p>- Pain controls with applying differ methods such as epidural or IV analgesics, or combination of oral analgesics, or even patients control pain by themselves. (Perkins, 2014)</p>
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Table 8 - Criteria condition for complication prevention

<i>Main category</i>	<i>Sub-category</i>	<i>From article</i>
Nursing skills	Education	<ul style="list-style-type: none"> - Have knowledge enough in mobility care to prevent dislocation as using of the toilet seat correctly. (Lee & Moorhead, 2014) - Education about self-care for patients with hip precautions throughout using a “high chair at home, raised toilet seat and abduction pillow”. (Schultz et al, 2017)
	Pain control	<ul style="list-style-type: none"> - Pain increasing with extreme pain, limb-length shortening and abnormal rotation must be monitored and have nurse intervention timely. (Schultz et al, 2017) - Exercises with limited range of conduction and abduction (move to toward and move away from the middle); also limited range of 90 degrees with flexion of the hip and external rotation of the hip. (Walker, 2012)
	Observation	<ul style="list-style-type: none"> - Complication might affect to gait and posture, or even cause lower back pain. Exception, LLD (leg length discrepancy) might cause loosing of THR hardware which might develop addition complications. (Perkins, 2021) - Considering signs of DVT such as oedema, tenderness, and redness of the

		<p>area. (Walker, 2012)</p> <ul style="list-style-type: none"> - Circling, write down date, time on the shadow of blood in the dressing occurs and monitoring whether if bleeding continuously. (Perkins, 2021) - After surgery, every 2 hours nurse must check parameters of intensive monitoring that including intensive circulatory vascular and motor-sensation (Lee & Moorhead, 2014)
	Knowledge	<ul style="list-style-type: none"> - The medication's effect is important, Thus nurse should be carefully with differ medication's side effect on each analgesics. (Schultz et al, 2017) - To prevent deep vein thrombosis, nurse should monitor parameter of lower ultrasound or changing in chemical anticoagulation. (Greenbaum et al., 2012) - 40% of patients undergoing orthopaedic procedures has risk of venous thromboembolism, combination of anticoagulant therapy including low molecular weight heparin, anti-embolic stockings or intermittent pneumatic compression should be applied. (Walker, 2012).
Supported channels	Clinical report system	<ul style="list-style-type: none"> - The clinical records support system with patients has high risk of complication. Nurse particularly should pay attention

		case with risk flag. (Lee & Moorhead, 2014)
	Self-report	<ul style="list-style-type: none">- Self-report helps collecting data of complications after THA. From there suitable care plan was built to prevent- Nurse should ask patient about pain levels to monitor pain medication's effect to manage pain relief better. (Schultz et al., 2017)

Table 9 - About chosen articles

<i>Article</i>	<i>Aim</i>	<i>Methods</i>	<i>Results</i>
Lee, M. , Moorhead, S. (2014). Nursing Care Patterns for Patients Receiving Total Hip Replacements. Orthopaedic Nursing. 33 (3): 149-58. doi: 10.1097/NOR.000000000000047	The aim of study is describing nursing interventions for inpatients who underwent total hip replacement, also examining relationships among patient characteristics, nursing interventions and complication rates need	Using the patterns of nursing interventions combine with cross table and graph to analyse the data	Review of nursing interventions being provided in a hospital with the relationships that need to consider commodities in care planning, monitoring, documenting and outcomes along with the onset of complications. Beside that, time to care was mentioned as an issue in caring process.
Perkins, A. (2021). Total hip replacement explained. Nursing Made Incredibly Easy!. 19(1):28-35. doi: 10.1097/01.NME.0000723364.92071.91	The aim of study is describing nursing care for patients before, during, and after hip replacement in variety of settings including hospitals, healthcare provider's offices, or home setting. The article also mentioned about physiology of the	Overview of total hip replacement	Reviewing of preoperative evaluation, Postoperative evaluation and care, also complications

	hip, disorders lead to total hip replacement, and complications		
Pulkkinen, M., Junttila, K., Lindwall, L. (2016). The perioperative dialogue – a model of caring for the patient undergoing a hip or a knee replacement surgery under spinal anaesthesia. <i>Nordic College of Caring Science</i> . 30(1):145-53. doi: 10.1111/scs.12233	The aim is to describe ideal model caring and serve patient's state who undergoing either a hip or a knee replacement surgery under spinal anaesthesia through collecting and analyzing collected data with conversation interviews of nurses	A qualitative approach	The results show that the perioperative dialogue is an ideal model of caring and serves the patients' desires of individual and dignified care.
Greenbaum, J.N., Bornstein, L.J., Lyman, S., Alexiades, M.M., Westrich, G.H., (2012). The Validity of Self-Report as a	The aim is to evaluate self-report, also surgeon assessments in recognition of complications management.	Using statistical analysis to assess complications that could be occurred to improve the safety and effectiveness of	The results show that rate of complications in which self-report was mentioned as references of managing the

<p>Technique for Measuring Short-Term Complications After Total Hip Arthroplasty in a Joint Replacement Registry. The Journal of Arthroplasty. Vol. 27; No. 7 2012; doi:10.1016/j.arth.2011.10.031</p>		<p>medical therapeutics</p>	<p>complications. From there, adjusting caring plan was considered to reduce complications occurring.</p>
<p>Schultz, K., Ewbank, M., Pandit, H.G.(2017). Changing practice for hip arthroplasty and its implications. British Journal of Nursing, 2017, Vol 26, No 22, 1238-1244</p>	<p>Providing insight into changes clinical practice and its implications for nurses basing on surgical approaches accordingly for patients who undergoing primary total hip arthroplasty and how to manage complications</p>	<p>A qualitative approach that mentioned about changing surgical approach and its implications affect to caring skills</p>	<p>The surgery technique such as surgical approaches or changes in anaesthesia techniques impacts to caring skills through education, recognizing complications, wound care in managing patients with THA</p>
<p>Walker, J. (2012). Care of patients undergoing joint</p>	<p>The article considers preparation of surgical process, as well as</p>	<p>A qualitative approach that describes nursing</p>	<p>Risk factors in surgical processes, as well as nursing</p>

<p>replacement. Orthopaedics. Vol 24; No 1; February 2012</p>	<p>caring after surgery which nurse as a key role in care and support patients through out surgical processes to manage complications occurring</p>	<p>role in recognition, caring, applying technique to manage complications</p>	<p>skills such as education and information, pain relief are important found results to manage complications</p>
<p>Joelsson, M., Olsson, L.E., Jakobsson, E. (2010). Patients' experience of pain relief following hip replacement. Journal of Clinical Nursing. 19, 2832–2838; doi: 10.1111/j.1365-2702.2010.03215.</p>	<p>The aim of article to describe patients' experience of pain and pain relief with THA</p>	<p>A qualitative approach with the content that was analyzed</p>	<p>Pain relief in postoperative surgery needed to pay attention to reduce fear in moving, feeling of faintness, or worst imaginable. Easing pain is specialized as professional care that using vari methods including nursing staff with training, pharmacological pain relief and technical aids</p>
<p>Bono, J.V., Robbins, C.E., Mehio, A.K., Aghazadeh, M., Talmo, C.T. (2012). Pharmacologic Pain Management Before and After</p>	<p>The aim of article to describe effective treatment measures with nonoperative measure and operative measure to manage pains. Especially,</p>	<p>Overview of pain relief went through stages of surgery that was mentioned with various combined methods between</p>	<p>The results show that effective various methods could be combined in pain relief's management including</p>

<p>Total Joint Replacement of the Hip and Knee. Elsevier Inc.. http://dx.doi.org/10.1016/j.cger.2012.05.004</p>	<p>effectively of multimodal pain management for patient with THR.</p>	<p>physical therapy, nonoperative measure, multimodal analgesia</p>	<p>education, physical therapy, activity modification, weight loss, and medications, and side effect management to reduce postoperative opioid consumption and the related adverse effects.</p>
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