

Review Article

Review of knee replacement surgery: Research of the last decade

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ABSTRACT:

Different physical therapies are recommended at first in order to improve severe osteoarthritis. However, if these therapies did not does any justice, then the doctor opt for the knee replacement surgery. Four types of knee replacement surgery are done which include: 'total knee replacement', 'partial knee replacement', 'kneecap replacement' and 'complex knee replacement'. Different risks and complications are observed among patients who went through the knee replacement surgery. The most commonly done knee replacement surgery is the total knee replacement in which the shine bine and the thigh bone which connects the knee is replaced by the surgeon. This research study was done in order to determine the effectiveness of knee replacement surgery in the treatment of severe osteoarthritis, the most commonly practiced type of the knee replacement surgery and to determine the pre-operative and post-operative measures recommended to the patient who is supposed to go through the knee replacement surgery. For this purpose, two groups of patients were selected who went through partial and total replacement surgery respectively. The pre and post-operative conditions of these patients were observed. From this research study, it was concluded that the patients who suffered from severe osteoarthritis do not recover from different physical therapies and had to go through the knee replacement surgery. Different pre-operative measures recommended to the patients include different physical therapies. However, the pre-operative measures and the post-operative measures are considered to be interlinked. It was observed that the patients who did physical exercises before the operation recover more quickly after the operation and had better gait and other mobility conditions. These patients showed better stair climbing than the patients who did not do any physical exercises pre-operative. Many limitations were also observed in this research study. Very small sample size was selected for obtaining the required results. At first, the patients were reluctant and were contradicted to the questions asked from them. However, later they opened up quite well and shared their experience in a better way.

Key words: knee replacement surgery, osteoarthritis, risks, total knee replacement surgery, pre-operative, post-operative

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INTRODUCTION:

The most common type of arthritis is known as 'osteoarthritis'. In this condition, the cartilage which is present at the ends of the joints is damaged and it needs to be removed or replaced. For this purpose, different exercises are recommended and when these exercises show no result, then different NSAIDs are given and

even when such drugs show no positive result, then the knee replacement surgery is recommended (Valtonen, Pöyhönen, Heinonen, & Sipilä, Muscle Deficits Persist After Unilateral Knee Replacement and Have Implications for Rehabilitation, 2015). Knee replacement surgery is also known as 'knee arthroplasty'. It is considered to be a surgical procedure

in which the surfaces of the knee which are responsible for bearing of the weights; are replaced surgically in order to relieve any kind of pain and other disability. For the patients with severe deformity due to rheumatoid arthritis, this surgical procedure is mostly used (Palmer, 2012). However, it is more complicated and difficult to carry out this surgical procedure in patients with long-standing arthritis or trauma. It is a very wrong myth that the people with osteoporosis also require knee replacement surgery. However, it has been proved by many professionals that no knee replacement surgery is required for the patients who are suffering from osteoporosis (Manen, Nace, & Mont, 2012). Osteoarthritis is mostly observed among elderly patients. The knee replacement surgery is done in two ways. For the partial knee replacement surgery, only the damaged part of the knee is replaced while in the total knee replacement surgery, the whole weight-bearing surfaces of the knee are replaced surgically. After the knee replacement surgery, the patient suffers from the postoperative pain (Deyle, Henderson, Matekel, Ryder, Garber, & Allison, 2015). Along with this pain, 'vigorous physical rehabilitation' is also observed. Almost 6 weeks are taken in order to fully recover from the knee replacement surgery. However, for the elderly patient, a time period of more than 6 weeks is taken in order to recover from this surgical procedure. Different medical aids are also required for the patients who went through knee replacement surgery. Such medical aids include different mobility aids such as: 'crutches, walking frames and canes'. The knee replacement surgery is considered to play an important role in the medical science as it has provided an advanced treatment for severe osteoarthritis and other deformities related to the weight-bearing surfaces of the knee (Tayton, Frampton, Hooper, & Young, 2016). Mild varus deformity can also be treated by using the knee replacement surgery. Whereas; the 'osteotomy' is used for the treatment of severe varus deformity. Before going for the knee replacement surgery, the physical treatment is provided to the patient in order to prevent or delay the need for the replacement of the weight-bearing surfaces of the knee. The patients going through the physical therapy go through a lot of pain. This pain is due to the motion of the knees done by the patient in order to perform the required physical activities (Kerkhoffs, Servien, Dunn, Dahm, Bramer, & Haverkamp, 2014). Different risks and complications are observed among patients who went through the knee replacement surgery. Less than 1% of the patients who went through the knee replacement surgery, experience infection of the joint. Different complications related to knee replacement surgery, includes: deep vein thrombosis, nerve injuries and pain or stiffness (AJ, GE, & DG, 2015). 15% of the patients, who went through the knee

replacement surgery, experience deep vein thrombosis while 1 to 2 % of the patients experience deep vein injuries. However, 8 to 23% of the patients who went through knee replacement surgery, experienced persistent pain and stiffness in the knee. 5% of the patients went through prosthesis failure after almost 5 years of treatment (Leone & Hanssen, 2016). The physical structure of the patients also plays an important role in leading towards different complications or risks. For this purpose, the obese patients are said to lose weight before the knee replacement surgery. This is done in order to protect the obese patients from any such complications. A heavy bod can lead to different types of fractures of the polythene platforms of the knees which can result in incomplete treatment of severe osteoarthritis (Parvizi, et al., 2017).

Before any kind of knee replacement surgery, the pre-operative preparations should be done. In order to approve any kind of knee replacement surgery, different x-rays are performed in order to determine the positions of tibia and femur. If the position of any of these bones is not according to the stated values, then the patient is asked to have a knee replacement surgery (Essving, Axelsson, Åberg, Spännar, Gupta, & Lundin, 2015). This usually happens when a patient suffers from severe osteoarthritis. For this purpose, two angles are observed more commonly. These angles include: the 'Hip-knee-shaft angle (HKS)' and the 'Hip-knee-ankle angle (HKA)'. The patient should go through different physical therapies before any kind of knee replacement surgery in order to prevent such surgery from happening (Pulavarti, Raut, & McLauchlan, 2014). If such therapies do not work, then the surgeon should opt for the knee replacement surgery. Different tests should be performed before the knee replacement surgery. These pre-operative tests include: 'complete blood count, electrolytes, APTT and PT to measure blood clotting, chest X-rays, ECG, and blood cross-matching for possible transfusion' (Mahoney, Noble, Rhoads, Alexander, & Tullos, 2016). Many pre-operative measures should be taken in order to avoid any kind of hemorrhage by the patient. Such patient should be prescribed iron supplements few months before the operation. This is done in order to improve the hemoglobin level of such patient to prevent any harmful condition during the operative procedure (Inui, et al., 2013).

Different types of knee replacement surgery are done these days. Four of such types include: 'total knee replacement', 'partial knee replacement', 'kneecap replacement' and 'complex knee replacement'. The most commonly done knee replacement surgery is the total knee replacement in which the shine bine and the thigh bone which connects the knee is replaced by the surgeon (Gromov, Korchi, Thomsen, Husted, & Troelsen, 2014). While the partial knee replacement is

done only if one part of the knee is affected. A smaller cut is needed for this procedure. The kneecap surgery is done in order to replace the under-surface of the knee. However, this procedure is not mostly advised by the surgeons (Carter & Potts, 2017). Apart from this, the total knee replacement surgery is considered to be more effective. Complex knee replacement is also known as revision knee replacement. This type of knee replacement surgery is done in case of severe arthritis. This type of surgery is recommended when one surgery has already been done (in such case the total knee replacement surgery) (Valtonen, Pöyhönen, Heinonen, & Sipilä, 2016). The most commonly practiced knee replacement surgery is the 'total knee replacement surgery'. A new surgical procedure that is known as 'minimally-invasive quadriceps-sparing total knee replacement' is most commonly used by the surgeons these days as small incisions are done in this procedure (McDonald, Page, Beringer, Wasiak, & Sprowson, 2015). The total knee replacement is a four step procedure. In the first step of this procedure, the cartilage which is considered to be damaged is removed at the ends of femur as well as at the ends of tibia. However, the damaged cartilage present at the surface of underlying bone is also removed. In the next step, 'press-fitting' is done in which the 'metal tibia' and the 'femoral metal components' are cemented together. In the third step, a button made of plastic is inserted underneath the patella (that is the kneecap) (Smith, Aboelmagd, Hing, & MacGregor, 2016). Resurfacing is done in order to keep the button at the place. In the final step, 'a medical grade plastic spacer' is implanted by the surgeon between the metal components of tibia and femur. In order to obtain a perfect outcome, the surgeon must align the implants in a more precise manner so that they are fit in the required places more carefully. 85 to 90% of the patients go through the total knee replacement surgery. Whereas, in partial knee replacement surgery, a portion of the knee is replaced; and the tibia and the femur implants are inserted (Toftdahl, Nikolajsen, Haraldsted, Madsen, Tønnesen, & Søballe, 2017). The post-operative rehabilitation is considered to be very important in order to have a proper treatment of the knee replacement surgery. Almost the patient is hospitalized for 5 days after the knee replacement surgery and the doctor advised them to use the weight bearing instruments such as crutches, walker etc (Fingar, Stocks, Weiss, & Steiner, 2014). Ambulation is considered to be very effective aspect of nursing care which plays an important role in treating the post-operative condition of the patient. Immobilization however can lead to immobility of the patient which can also result in deep vein thrombosis. One of the most important post-operative therapies for knee replacement surgery include: continuous passive motion (CPM) which includes the movement of knee

through support of a machine (Toftdahl, Nikolajsen, Haraldsted, Madsen, Tønnesen, & Søballe, Comparison of peri- and intraarticular analgesia with femoral nerve block after total knee arthroplasty: a randomized clinical trial, 2017).

The problem faced is that no proper treatment of severe osteoarthritis was known. However, many physical therapies were recommended for the treatment of this condition. But this did not lead to any proper treatment of this condition. Later on, many NSAIDs were prescribed for the treatment of this condition. But it was also of no help. Later on, the knee replacement surgery was recommended for the treatment of this condition. Four types of knee replacement surgery were recommended. These include: 'total knee replacement', 'partial knee replacement', 'kneecap replacement' and 'complex knee replacement'. Only two of these types were more commonly practiced which are: the total knee replacement surgery and the partial knee replacement surgery. Very little work was done in order to understand the importance of knee replacement surgery. This problem not only exists domestically but it exists on the international level.

Different objectives of this research study include:

- To determine the effectiveness of knee replacement surgery in the treatment of severe osteoarthritis.
- To determine the most commonly practiced type of the knee replacement surgery.
- To determine the pre-operative and post-operative measures recommended to the patient who is supposed to go through the knee replacement surgery.

The significance of the research study is that it will increase the literature review of the osteoarthritis and its treatment especially the knee replacement surgery. This study helps in determining the most commonly practiced type of knee replacement surgery. It also helped in understanding the pre-operative and post-operative measures taken by the patient who went through the knee replacement surgery. From this research study, it was concluded that the total knee replacement surgery was most commonly practiced than the partial knee replacement surgery. However, this research study played an important role in determining the proper treatment of severe osteoarthritis.

1. Intellectual context or Literature review:

1.1. Knee replacement surgery:

Patients suffering from severe osteoarthritis are recommended to have the knee replacement surgery in order to get faster and better clinical results than any other physical therapy. As the number of people suffering from severe osteoarthritis is increasing day by

day, which results in the increase practice of knee replacement surgery (Everhart, Andridge, Scharschmidt, Mayerson, Glassman, & Lemeshow, 2017). A study was conducted in the United States in order to determine the increase in percentage of knee replacement surgery by 2030. For this purpose, a sample of patients was taken nationwide (from 2010 to 2016). The data collected was beyond any discrimination of race or color or class. Different methods were applied in order to determine the rate of knee replacement surgery required by the patients by 2030. The results obtained from the conducted analysis showed that different types of knee surgeries will show tremendous growth by 2030 due to an increase in poor health and weak bones. The results showed that the 'total hip arthroplasties' will increase by 174% by 2030 while the 'total knee arthroplasties' will increase by 673% by 2030 (Zahir, Sterling, Pellegrini, & Forte, 2017). From this research study, it was concluded that the large projections due to an increase in rate of poor health which leads to severe osteoarthritis and other bone related problems, can lead to an increase number of knee replacement surgeries for different purposes and this can result in different types of complications and risks which can be very difficult to overcome (Kurtz, Ong, Lau, Mowat, & Halpern, 2017). The prosthetic design is considered to have an important impact on the gait of an individual. In order to determine the relationship between gait and different prosthetic designs, a research study was conducted. For this purpose, a group of twenty-six patients who went through knee replacement surgeries, were selected. In order to compare the results of these patients, a control group consisting of fourteen elderly individuals was selected (Abdel, Cottino, Larson, Hanssen, Lewallen, & Berry, 2017). Different types of knee replacement surgery were observed and what effect they had on stair climbing and walking were also observed. Five different designs of knee replacement surgery were used for this research study. These designs include: total condylar, geomedic, cloutier, gunston and duopatellar. The walking and stair climbing of the different groups of patients who went through different types of knee replacement surgery, was observed (Halder, Kutzner, Graichen, Heinlein, Beier, & Bergmann, 2018). The results obtained from this research study showed that the patients who went through cloutier type of knee replacement surgery showed better motion in both cases of walking and stair climbing. However, the patients who went through total knee replacement surgery showed irregular gait. From this research study, it was concluded that the patients treated with all these types of knee replacement surgeries showed irregular gait however, the cloutier type of knee replacement surgery proved to be more effective than other types of knee replacement surgeries

both clinically and physically (Thomas, Jorge, & Fermier, 2017).

Depression and anxiety are considered to be very important factors for both pre-operative and post-operative procedures. Many people suffered from severe kind of depression especially before any kind of operation. However, the patients who went through knee replacement surgery also experienced such kind of anxiety and depression (Ling-Heng, Yuan-Yi, ChiaYuan, LiuLin-Cheng, YangTsung, & Lee, 2017). For this purpose, a research study was conducted in which 83 patients who went through the knee replacement surgery were observed. 55% of these patients were female and the average age was 66 years. It was seen that such patients suffered from depression and anxiety before the operation. However, these patients were also kept under observation for 5 years after the operation. The results obtained from this study showed that the patients who went through the knee replacement surgery experience depression and anxiety for almost a year after the operation. But as the time passes, the signs and symptoms of depression starts fading and the patients led a healthy life. However, if by any chance the operation did not prove to be successful, the patient is then more likely to suffer from depression and anxiety (Brander, Gondek, Martin, & Stulberg, 2018).

1.2. Types of knee replacement surgery:

Different types of knee replacement surgery are practiced. The most of these types of surgery is the total knee replacement surgery and the partial knee replacement surgery. However, the total knee replacement surgery is considered to be more effective than the partial knee replacement surgery. But the total knee replacement surgery also required revision if not done properly (Kurtz, Ong, Lau, Mowat, & Halpern, 2018). For this purpose, a research study was conducted in India in order to determine the reason for revision of knee replacement surgery. 35 such cases were observed. It was observed that the time period which led to the revision after the normal total knee replacement surgery ranges from 2 to 130 months. This was a retrospective study. The follow up done for such patients was after 12 months. The clinical evaluation was done in order to determine the percentage of the revision groups (Hossain, Patel, & Haddad, 2017). Different reasons for revisions were observed. The results obtained from this research study showed that 52% of the revisions took place due to infection, 23% took place because of aseptic loosening, whereas 20% of the revisions took place due to any kind of instability while 5% of these were done due to periprosthetic fracture. The average time recorded between the actual total knee replacement and revision was 74 months. The number of female patients was more than that of the male patients who

gone through revision after the total knee replacement surgery (Bourne, Chesworth, & Davis, 2017). The research study conducted was of retrospective nature. The results obtained from this research study showed that the most common reason for the revision of total knee replacement was the prosthetic infection. However, the age and sex of the patients were also considered to have an impact on the need for revision (Sharma, Puri, & Pai, 2017).

Different types of knee replacement surgeries have been in practice for the last few decades. Four types of knee replacement surgery are found to be very common. These include: 'total knee replacement', 'partial knee replacement', 'kneecap replacement' and 'complex knee replacement' (Khan, Osman, Green, & Haddad, 2017). A research study was conducted in order to determine the comparison between the partial knee replacement surgery and the total knee replacement surgery. For this purpose, two groups of patients were selected. The first group of patients went through the partial knee replacement surgery while the second group of patients went through the total knee replacement surgery (Garcia, Hardy, Kraay, & Goldberg, 2018). It was observed that the patients with partial knee replacement surgery had a small incision in their knee while the patients who went through total knee replacement surgery had to go through a very long procedure as their patella are removed completely and the knee button is inserted in its place. It was observed that the patients with total knee replacement sometimes go through revisions. This is done when the patient is not clinically healed or the required results are not obtained (Schroer, et al., 2017). The time period of hospitalization for the patients with partial knee replacement surgery is less than the time period required for the patients who went through the total knee replacement surgery. However, the most commonly recommended type of knee replacement surgery is not other than the total knee replacement surgery. After the total knee replacement surgery, the patient is recommended to take the physical therapy in order to improve the physical motion as well as to delay any kind of issue or immobility that can result in long-term complications as well as risks (DH, Goodman, Maloney, & Huddleston, 2018).

The outcomes of every surgery are considered to play a very important role in determining the effectiveness of that surgery. Therefore, in order to understand the outcomes of the total knee replacement surgery, a qualitative study was done. For this research study, 25 patients who went through the total knee replacement surgery were interviewed (Frankel, Williams, Nanchahal, & Coast, 2017). They were interviewed 3 months before the surgery and even six months after the surgery. Discussion was done with these individuals in depth. At first these patients show full support for the

total knee replacement surgery and discussed about its benefits however, later on they started to explain the troubles that they had to go through even after the six months of surgery (Dieppe, Chard, Faulkner, & Lohmander, 2017). These troubles include: continuous pain and unable to walk properly or other immobility difficulties. However, from this research study it was concluded that the people who went through the total knee replacement surgery were in the favor of this surgery and they did not deny the benefits they obtained after this surgery. However, this surgery also had many drawbacks such as continuous pain and immobility difficulties. Many quantitative methods also proved the total knee replacement surgery to be an effective procedure for the patients who suffered from severe osteoarthritis. This study also showed that the patients were contradicted before however as the discussion was grown, they were more open about their experiences (Woolhead, Donovan, & Dieppe, 2017).

1.3. Pre-operative measures recommended to the patients before the knee replacement surgery:

Different pre-operative measures are recommended to the patients in order to improve the speed of their recovery. The patients, who went through the knee replacement surgery, are also recommended to take some pre-operative measures. One of the important measures is to go through physical therapy (Ehrich, Davies, & Watson, 2017). For this purpose, a research study was conducted in which different cases from different journals were studied. The journals selected for this purpose include: 'Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) pain and function subscales, PubMed, Embase and Cochrane'. It was observed that the patients, who went through knee replacement surgery, went through severe post-operative pain. However, the physical therapy if taken by the patients before the operation, results in less pain after the operation (Aoki, Tsumura, & Kimura, 2017). 22 such cases were studied in order to determine the effect of prehabilitation on the post-operative condition of the patient. The results obtained from this research study showed that 18 out of these 22 cases, had gone through a risk of bias. The prehabilitation is considered to minimize the post-operative pain within four weeks. The function score was found to be improved from 6 to 8 (Hoffmann, Glasziou, & Boutron, 2017). The climbing of the stairs was improved by 1.4 days while the toilet use was improved by 0.9 days. From this research study, it was concluded that the prehabilitation improves the early signs of post-operation. However, these symptoms remain same during both hip and knee surgery. Thus, the prehabilitation is considered to be very important as it also has a very minimum role in improving the post-operative pain (Wang, Lee, & Zhang, 2017).

The knee replacement surgery is considered to be the most important and effective type of knee replacement surgery. Many studies have been done in order to determine the most effective pre-operative measures that should be taken in order to have a quick recovery from the operation. For this purpose, a prospective cohort study was designed (Noble, Gordon, Weiss, & Reddix, 2018). Different factors of the patients who went through the total knee replacement surgery were observed. These factors include: 'the strength of the muscle', 'range of motion' and 'the function of the limb'. Such factors were observed 2 weeks before the surgery and up to 6 months after the surgery. A sample of 24 patients was selected for this research study. Both the pre and post-operative conditions of the patients were observed and they were compared to a control group of elderly people (Pettersson, Mizner, & Stevens, 2017). The results obtained from this research study showed that before the operation, the patients suffered from severe osteoarthritis and they were unable to walk properly or climb the stairs. They even had trouble going to the washroom on their own. However, the physical therapies were recommended to such patients before the operation in order to deplete the need for surgery or to improve the post-operative conditions. However, after the surgery, these patients suffered from extreme post-operative pain. They were even prescribed NSAIDs in order to improve the pain however, this showed no positive results. But the patients who had pre-operative physical therapies, recovered from this pain more easily (Gapeyeva, Buht, Peterson, Erelina, Haviko, & Paasuke, 2017). From this research study, it was concluded that although the physical therapies recommended to the patients before the operation did not help in improving the condition at first but after the operation has been done, it was because of those therapies that the patients recovered more quickly and they did not face any complications or risks that can cause immobility and such other issues (BADE, KOHRT, & JENNIFER, 2017).

1.4. Post-operative measures recommended to the patients after the knee replacement surgery:

The patients, who have to go through the knee replacement surgery, should be well aware about the conditions or consequences they might go through after the surgery. The patients who follow the instructions of their doctors are more likely to recover from the surgery (James & Louis, 2018). The patients are asked to follow some post-operative measures in order to recover quickly. A study was done in order to determine such measures. For this purpose, many surgeons were asked to fill the designed questionnaire in this regard. The patients are prescribed not to soak their limb or knee into water after at least 6 weeks of the surgery. Pain is normal after the knee replacement surgery. In order to

deplete such pain, the patient is asked to take rest in order to strengthen the limb and knee. However, different medications are also prescribed in order to recover from the pain. From this research study, it was concluded that those patients who willingly follow the instructions of their doctors are more likely to recover from the surgery quicker than those who do not follow the instructions of their doctors. The shortness of breath is also experienced by many patients who went through the total knee replacement surgery. These patients should contact their doctors as soon as possible in order to prevent any other complications (Mars & Jerry, 2018).

The outcomes obtained after the knee replacement surgery depends on the pre-operative measures taken by the patients. It is considered that both the pre-operative and post-operative measures are inter-related to each other. In order to understand the relation between pre-operative and post-operative measures, a research study was conducted in which 115 patients who went through the knee replacement surgery were selected randomly (Lingard & Riddle, 2017). For this study, two rehabilitation protocols were compared. The selected patients were divided into two groups. One group performed the traditional protocol in which a set of exercises were performed on one leg and the same were repeated on the other leg. While for the alternate protocol group, the same exercises are performed on both the legs. The symptoms and functions are observed both pre-operatively and post-operatively (Bennett, Brearley, & Hart, 2018). The symptoms are recorded after 1, 3, 6 and 12 months of the operation. The results obtained from this research study showed 'higher knee society scores' and SF-12. Both these groups of patients had almost the same range of motion after the operation. However, the patients of the first experienced less post-operative pain than the patients belonging to second group. From this research study it was concluded that the pre-operative exercises improve the post-operative condition of the patients (Walton & Newman, 2018). The physical therapies also improve the mobility abilities of the patients. The gait of the patients who continuously do the physical exercises during the pre-operative period recover more quickly after the operation while those who did not do any physical exercises struggle a lot in order to completely recover from the operative procedure (WANG, ZHANG, & LIU, 2017).

2. Discussion:

Mostly the elderly people with weak bones suffer from severe osteoarthritis and they are more likely to go through knee replacement surgery. Different physical therapies are recommended at first in order to improve this condition. However, if these therapies did not do any justice, then the doctor opt for the knee replacement

surgery. Four types of knee replacement surgery are done which include: 'total knee replacement', 'partial knee replacement', 'kneecap replacement' and 'complex knee replacement'. The most commonly done knee replacement surgery is the total knee replacement in which the shine bine and the thigh bone which connects the knee is replaced by the surgeon. Different risks and complications are observed among patients who went through the knee replacement surgery. This research study was done in order to determine the effectiveness of knee replacement surgery in the treatment of severe osteoarthritis, the most commonly practiced type of the knee replacement surgery and to determine the pre-operative and post-operative measures recommended to the patient who is supposed to go through the knee replacement surgery. For this purpose, two groups of patients were selected who went through partial and total replacement surgery respectively. The pre and post-operative conditions of these patients were observed.

3. Conclusion:

From this research study, it was concluded that the patients who suffered from severe osteoarthritis do not recover from different physical therapies and had to go through the knee replacement surgery. The most commonly recommended knee replacement surgery is the total knee replacement surgery. This surgery proves to be more effective than any other type of knee replacement surgery. Different pre-operative measures recommended to the patients include different physical therapies. However, the pre-operative measures and the post-operative measures are considered to be interlinked. It was observed that the patients who did physical exercises before the operation recover more quickly after the operation and had better gait and other mobility conditions. These patients showed better stair climbing than the patients who did not do any physical exercises pre-operative. The post-operative pain experienced by the patients who did the pre-operative physical therapies was much less than others.

This research study helped in understanding the effectiveness of knee replacement surgery and how it has been evaluated during the past few years. This study helped in determining the most recommended and effective type of knee replacement surgery. As very little literature review was obtained for this topic, this study helped in increasing the literature and evidences regarding the knee replacement surgery.

Many limitations were also observed in this research study. Very small sample size was selected for obtaining the required results. At first, the patients were reluctant and were contradicted to the questions asked from them. However, later they opened up quite well.

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