

EFFECTIVENESS OF PREHABILITATION ON POSTOPERATIVE OUTCOME OF PATIENT UNDERGOING TOTAL KNEE ARTHROPLASTY AT SELECTED HOSPITAL

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ABSTRACT

Aim of the study: - To assess the effectiveness of prehabilitation on postoperative outcome of patient undergoing total knee arthroplasty.

Background: Osteoarthritis is one of the most common health problem, encompassing decrease strength, functional ability. The rate and progression of deformities can vary greatly from person to person. But generally surgery take place important role to replace the disability to normal. Surgery also refers to repair deformities and disability. The physiological decline in patient undergoing surgery refers to physical changes an individual experience because of declines in the normal functioning of the body resulting unrelenting pain, restricted movement, lengthening of hospital stay, inability to do self-care.

Design: quasi experimental design with one group pre-test post-test design.

Methods: Non – probability - Convenience Sampling Technique was used to select the samples for this study. A total of 30 patients participated in the study. 6 minutes' walk test and 30 second sit to stand was used to assess the physical parameters for data collection.

Result: The pretest mean score of functional ability was 19.63 ± 7.12 and the post-test mean score was 29.63 ± 7.73 . The calculated paired 't' test value of $t = 5.666$ was found to be statistically significant at $p < 0.001$ level. The pretest mean score of leg strength was 14.03 ± 4.05 and the post-test mean score was 20.47 ± 2.57 . The calculated paired 't' test value of $t = 7.600$ was found to be statistically significant at $p < 0.001$ level.

Conclusion: - - There was a significant improvement in the level of leg strength and functional ability among arthroplasty patient after prehabilitation ($p < 0.001$). Hence the study revealed that the prehabilitation exercise was effective.

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INTRODUCTION

Osteoarthritis is one of the most common health problems, encompassing decrease strength, functional ability. The rate and progression of deformities can vary greatly from person to person. Generally surgery take place important role to replace the disability to normal. Surgery also refers to repair deformities and disability. Adults are the vulnerable to bone disease and deformities. With surgery, the ability to do the functional activities declines to some degree in every person.

The physiological decline in patient undergoing surgery refers to physical changes an individual experiences because of the decline in the normal functioning of the body resulting unrelenting pain, restricted movement, lengthening of hospital stay, inability to do self-care. As people are living longer, the demand of knee arthroplasty elective surgery is increased. This situation can affect the health and function of the person undergoing surgery. Therefore they require careful management to ensure proper care and improve their quality of life.

After surgery to reduce the severity of postoperative outcome, physical therapy program plays an important role to strengthen the muscles around the replaced joint to prevent scarring, contracture and joint stability. Prehabilitation is a form of strength training preparation program to prepare a person physically and mentally for surgery to optimize the chance for a successful outcome and a quick recovery.

Background

In current life style practices many peoples are affected with osteoarthritis, in this level of knee osteoarthritis was increased because of aging and lifestyle. Osteoarthritis occurs most often in older people, younger people sometimes get osteoarthritis primarily from joint injuries. Joint deformity and disease affect people in many ways, to reduce the severity of disease, number of knee. Replacement surgeries were increased for reduction of pain, improving range of motion and correcting joint alignment. However the recovery of patient after surgery became prolonged due to decreased optimal function. Good pre preparation of surgery helps the patient to better post-operative outcome and helps in early recovery, this can be particularly challenging for a patient who is already experiencing limited mobility, pain and reduced energy due to illness. In planned surgery the waiting period was lengthened by weeks or a month, during this period the patient engaged with physical exercise and relaxation programs for improving functional capacity.

Senthil Kumar s, Balamurugavel p.s., et.al (2016) a quasi-experimental study to find out the effectiveness of prehabilitation exercise on total knee arthroplasty patients. Totally 30 planned surgery patients selected in Rajah Muthiah medical college, Chidambaram, orthopaedic outpatient department preoperative ward, were selectively allocated into interventional for a period 4 month prior to surgery. The researcher were taught prehabilitation exercise. There was an improvement in functional ability in experimental group. Prakash Patel, narmata patel.et.al. (2015) a quasi-experimental approach with pre-test and post-test design was conducted in Gujarat, to evaluate the effect of prehabilitation exercise on total knee arthroplasty patients. Sixty adults are planned for surgery, aged 18 to 60 years old participated in the study. The experimental group given a 30 minutes of exercise training, 2 times a day for 2 weeks. The control group continued their usual treatment regimen. Leg strength and functional task were measured after surgery 3rd post-operative day by using 6 minutes’ walk test and 30 second sit to stand test. The experimental group showed a significant improvement in leg strength scores (p=0.028) and functional task score (p=0.006). The control group shows no significant difference.

Aim of the study: To assess the effectiveness of prehabilitation on postoperative outcome of patient undergoing total knee arthroplasty at selected hospital nagercoil.

MATERIALS AND METHODS

The patient who are admitted in preoperative ward for 1 week prior to surgery were selected as a sample. 30 samples were selected by using convenient sampling technique. After sample selection informed consent was obtained from each sample and general instruction has to be given .The investigator collected the demographic data by structured questionnaire.

The investigator assess the pre-test level of leg strength and functional ability by using 6minutes walk test and 30 second sit to stand test. The group was trained prehabilitation exercise by investigator on the next day in Total 30 patient who are admitted in preoperative ward for 1 week prior to surgery were selected as a sample. Quasi experimental design with one group pre-test post-test design. Non – probability - Convenience Sampling Technique was used to select the samples for this study. 6 minutes’ walk test and 30 second sit to stand was used to assess the surgery outcome functional ability and leg strength.

Ethical consideration: The project has been approved by the ethics committee of the institution. Informed consent was obtained from the participants before initiating the study.

RESULTS

SECTION 1: Frequency and percentage distribution of demographic variables 15(50%) were in the age group of 41 – 50 years, 16(53.33%) were male, 9(30%) were unemployed, 13(43.33%) had gardening as hobby and 23(76.67%) involved in jogging as routine work.

SECTION 2:

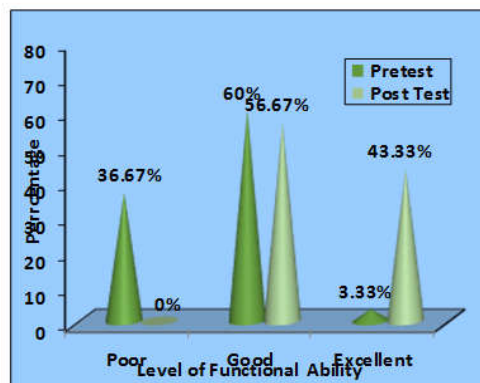


Figure 1. Percentage distribution of pre-test and post-test level of functional ability among patients undergoing total knee arthroplasty

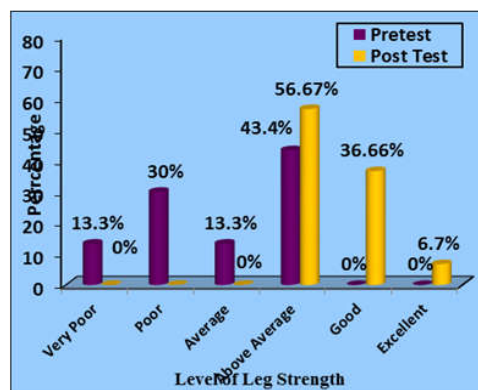


Figure 2. Percentage distribution of pre-test and post-test level of leg strength among patients undergoing total knee arthroplasty

SECTION 3: The pre-test mean score of functional ability was 19.63±7.12 and after the administration of rehabilitation on post-operative outcome to the patients undergoing total knee arthroplasty the mean score was 29.63±7.73.

The calculated paired 't' test value of $t = 5.666$ was found to be statistically significant at $p < 0.001$ level. This clearly indicates the rehabilitation on post-operative outcome was found to be effective in improving the functional ability among patients undergoing total arthroplasty

SECTION 4: The pre-test mean score of leg strength was 14.03 ± 4.05 and after the administration of rehabilitation on post-operative outcome to the patients undergoing total knee arthroplasty the mean score was 20.47 ± 2.57 . The calculated paired 't' test value of $t = 7.600$ was found to be statistically significant at $p < 0.001$ level. This clearly indicates the rehabilitation on post-operative outcome was found to be effective in improving the leg strength among patients undergoing total arthroplasty.

SECTION 5: The demographic variable physical activities had shown statistically significant association with post-test level of functional ability at $p < 0.05$ level ($d.f=1$).

SECTION 6: The demographic variable physical activities had shown statistically significant association with post-test level of leg strength at $p < 0.05$ level ($d.f=2$).

DISCUSSION

The first objective was to assess the level of leg strength and functional ability among the patient planned for knee arthroplasty surgery during preoperative period.

The patient planned for knee replacement surgery and who met the inclusion criteria was selected as samples for the study, the pre-test level of leg strength and functional ability was assessed by using six minutes' walk test and thirty second sit to stand test. The mean score in the pre-test level of functional ability and leg strength in the study group was less and found that 92.2% in functional ability and 88.8% in leg strength has poor level of functional ability and leg strength. In this first objective the level of pre-test level was assessed and it shows that higher proportion of the samples were poor functional ability and leg strength and none of the samples had excellent level of functional ability and leg strength. Most of the patients were able to do simple exercise on their own knowledge. But none of them had adequate practice related to prehabilitation exercise.

This study was supported by Rakesh patidhar et.al, (2013) conducted to assess the effectiveness of prehabilitation for knee arthroplasty patient. Fifty planned surgery patients were selected by non-probability purposive sampling technique. This study revealed that patients who were undergoing knee arthroplasty surgery need to practice prehabilitation exercise for good leg strength and functional ability and to prevent post-operative complication. Hence from the above studies, it was concluded that the majority of planned knee arthroplasty surgery patients had inadequate practice of physical therapy. So they need to be practice prehabilitation exercise.

The second objective was to determine the effectiveness of prehabilitation on leg strength and functional ability among total knee arthroplasty patients during post-operative period.

People with knee replacement surgery are affected with Pain, limited mobility, the longer treatment is off, the greater risk of patient to lack their activity of daily living.

The surgery outcome undertake rehabilitation successfully, so they can return to their own environment with better outcomes, more independence and better quality of life. More than 20 million of people who underwent knee arthroplasty surgery received prehabilitation exercise, reported by National institute of Health(2013) prehabilitation exercise have been proved by the researcher and can be implemented in practice in hospital setting.

The findings of the present study showed that the effectiveness of prehabilitation exercise on post-test level of leg strength and functional ability was found statistically significant at $p < 0.001$ level which indicates that prehabilitation exercise found effective in increasing the level of functional ability and leg strength among patient underwent knee arthroplasty surgery. This study was supported by Victor c Thomas (2011) conducted on 40 patients for a period of one weeks, each patient trained for pre-operative exercise before surgery, post-test was done on third post-operative day. This study finding revealed that there was a significant ($P < 0.001$). Improvement in leg strength and functional ability. Hence the prehabilitation exercise brought significant improvement in the level of post-operative outcome leg strength and functional ability for patient underwent knee arthroplasty.

The third objective was to associate the demographic variables and the post-test level of leg strength and functional ability among total knee arthroplasty patients

The findings of the study showed that there was a significant association between physical activity of patient with post-test level of functional ability and leg strength among knee arthroplasty patients. This study was supported by Mahendran D, et.al (2014) reported that out of 60 patients 30 patients received prehabilitation exercise along with their regular activities like jogging, yoga. The results shows significant increases in range of motion and functional ability level as compared to other group who received only prehabilitation exercise. Hence it concluded that prehabilitation exercise with regular physical activity improves the functional ability. Hence the prehabilitation exercise not only improves muscle strength and leg endurance but also patient who are all doing activities like walking and simple activities can improves muscle strength, this can help patient to progress better post-operative outcome.

Conclusion

This study indicate there was an improvement in the level of functional ability and leg strength among patient after receiving prehabilitation exercise. It was statistically significant ($p < 0.001$). Hence the study revealed that the prehabilitation exercise was effective to improve the post-operative outcome leg strength and functional ability among patient with knee arthroplasty surgery.

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