

Effects of Perioperative Psychological Intervention on Rehabilitation Process of Patients with Total Knee Arthroplasty

Dongqi Yang, Zhixiang Liu, Zongren Yu

Nanjing University of Chinese Medicine, Nanjing 210046, China.

Abstract: Background: This study focuses on evaluating the effects of perioperative psychological intervention on rehabilitation process of patients with total knee arthroplasty (TKA). Method: We selected 40 patients randomly which all need to receive total knee arthroplasty in Nanjing Drum Tower Hospital during the period from January 2022 to March 2022. The patients were randomly assigned to two Groups (20 in each group): an intervention group (Psychological intervention combined with routine nursing, drug and rehabilitation therapy) and a control group (routine nursing, drug rehabilitation therapy). During each patients' perioperative TKA surgeries, three scales (including VAS, ROM and ADL) are used to assess two groups. Result: After one week of psychological intervention, the pain score of the intervention group was lower than that of control group, the knee motion was greater than that of control group, and the ADL score was higher than that of control group. There was a significant difference in the treatment recovery between the two groups ($P < 0.05$). Conclusions: Perioperative psychological intervention can promote the rehabilitation process of TKA patients, It can significantly improve pain, joint activity limitation, disuse muscle atrophy and other problems in a short period of time after surgery. Besides, it will effectively help patients to overcome the fear of movement, anxiety and improve patients' confidence, rehabilitation cooperation and prevention of complications, make patients adapt to the later rehabilitation life.

Keywords: Rehabilitation; Total Knee Arthroplasty; Perioperative Period; Psychological Intervention;

Introduction

With the continuous improvement of medical level, TKA has been widely used in degenerative osteoarthritis, rheumatoid arthritis, traumatic arthritis and so on^[1]. Surgical treatment that help patients rebuild knee function and avoid complications of various knee diseases (such as long-term bed-ridden pneumonia, venous thrombosis, pressure ulcers and so on) has been widely recognized and accepted by the society. However, a large number of studies have shown that the perioperative and postoperative rehabilitation effects of TKA are still unsatisfactory. At present, Fast-Track Surgery, (FTS)^[2] has been deeply applied to the rehabilitation of perioperative TKA patients. The process of rehabilitation intervention is extremely rapid: On day 1 after the operation, appropriate passive activities of both lower limbs can be carried out by therapists; On day 2, the therapists can perform limb isometric, isotonic and joint rotation exercises; On day 3, the patients can carry on the walking training and ready to discharge.

However, since TKA is mainly aimed at elderly patients with inherent traditional concept of braking and surgical stress, most elderly patients generally have negative emotions such as fear of movement, anxiety and resistance. So this condition can be extremely detrimental to recovery. Many studies (such as PAN's research^[3]) have proved that the patient's negative emotion is inversely proportional to the recovery degree of limb function. Therefore, this clinical study adopted the perioperative psychological intervention control study method. And the objective is to explore the influence and application value of systematic and targeted psychological intervention on the rehabilitation process of patients during the perioperative period of total knee replacement. The following report is made under this circumstances.

1. Data and Methods

1.1 General data

All 40 patients with perioperative TKA were from Nanjing Drum Tower Hospital during the period from January 2022 to March. All subjects met the audit standards of hospital ethics committee and obtained informed consent of patients and their families. Patients were randomly assigned to an intervention group and a control group with 20 cases each. There was no significant difference in basic data between the two groups. ($P > 0.05$), So this study possesses comparability. The author conducted the study design, and the implementation and evaluation were completed by the corresponding rehabilitation therapists.

1.2 Inclusion criteria:

(1) All patients underwent TKA after their first onset, and their vital signs are stable; (2) All patients without conscious and speech disorder have a certain ability to understand and express themselves, they can cooperate in the evaluation of treatment; (3) They are all above primary school education; (4) They are all between 55 and 75 years old; (5) They all need to be assessed perioperatively (pre-, intra-, and postoperative)

1.3 Exclusion criteria:

(1) The patients had all kinds of psychological disorders, mental diseases and cognitive dysfunction before surgery; (2) The patients had coma, speech and hearing impairment, and was unable to cooperate with treatment and evaluation; (3) The patient has severe heart, lung, liver and kidney dysfunction.

1.4 Methods

The control group received routine perioperative TKA nursing, drug therapy, analgesia and rehabilitation treatment. In the intervention group, psychological intervention was added on the base of routine treatments of perioperative TKA

1.4.1 Routine treatments:

Routine treatments covers the following aspects: (1) Preoperative basic health education and rehabilitation exercise (including moderate passive and active) (2) Postoperative routine drug treatment (Inject 50mg flurbiprofen ester 0.5h before rehabilitation exercise to relieve pain during the training), functional recovery training. The training consists of the following components: Ankle pump exercise (200 times a day, 20*10 groups); (2) Knee stretching exercises (twice a day, 20-30min each time), knee bending exercises (10 times a day, bending to the maximum Angle for 1-2min); (3) Straight leg lifting exercise (lift 20cm from the bed); (4) Walking with the aid of walking AIDS.

1.4.2 Psychological intervention

Perioperative psychological intervention methods with easy operation and strong guidance were adopted to maximize the enthusiasm of patients within a reasonable range of indicators. The specific intervention methods are as follows:

(1) In preoperative TKA, therapists should establish friendly trust relationship with patients, attention to understand the needs of the patients, introduce the program of rehabilitation and Successful stories to patients and their families with straightaway language. therapists need to make patients clear about their actual situation and expectations in order to alleviate symptoms of patients' resistance and the fear of movement.

(2) Therapists pay attention to the use of facial expressions and body language during psychological intervention, They need to smile from beginning to end and be sincere in all kinds of investigations and evaluations to get closer to the patient.

(3) Brief psychodynamic psychotherapy[4]: (1) Therapists try to establish problems, complaints, goals, and solutions to guide patients to express their true feelings, thoughts and demands, so in this way we can explore the key which causes anxiety and the fear of movement. At the same time, we also need to discuss with patients' families the space and methods for early improvement in a short period of time. (2) Rest period: This refers to that in the intermittent period of psychological intervention, patients need to recall and reflect on their psychological intervention and the conversation content at this stage. Meanwhile, the therapists also have to sort out the treatment process during this period, summarize the existing

deficiencies and prepare content for feedback .③Positive feedback: During this period ,the patients 'cooperation, affirmation of the therapists' psychological intervention and efforts and wishes for rehabilitation need to be praised and praise. The therapists encourage the patients to continue to carry on and work hard, and at the same time assign some tasks to promote the patients' ability to solve and think about their own problems with the current plan.

(4) Relaxation training: Guide patients to perform abdominal breathing and learn to relax and relieve stress

(5) Eye movement desensitization and reprocessing (EDMR)^[5]: therapists move the finger back and forth and asks the patients' eyes to follow the finger, while instructing the patients to open their eyes and visualize the situation during the onset of the disease. After repeated sessions, therapists guide the patient to re-experience the situation during the onset. So it can alleviate symptoms of persistent high alertness.

(6) Biofeedback therapy ^[6]: Using the equipment to train patients to consciously regulate the function of various metabolic organs in the body, to eliminate the pathological process, relieve postoperative pain, regulate emotions. The above treatment frequency remained during the whole perioperative period .

1.5 Observed indicator

The ROM, VAS, ADL score of patients in the intervention group and observation group was observed before operation and the 1st and 3rd day after operation

1.5.1 Range of Motion (ROM)

This is the indicator to assess the range and degree of joint motor function impairment. Its main purpose is to determine whether the joint movement is limited and determine the degree of joint motion limitation;

1.5.2 Visual Analogue Scale (VAS)

It can effectively assess the pain of patients. On a scale of 10 points, 0 indicates no pain and 10 indicates the most unbearable pain.

1.5.3 Activity of Daily Living (ADL)

This scale includes 14 items respectively : Self-care (feeding, dressing, grooming, toileting, walking and bathing); Ability to use tools (making phone calls, shopping, housework, laundry, walking, using transportation, taking medicine and taking care of finances).

The scale has a total score of 100, the higher the score, the better the ability to live. '< 60' indicate moderate dysfunction and requiring help from others. When patients underwent treatment, '> 40' indicate the greatest benefit.

1.6 Statistical method

The data of the two groups were processed by SPSS software. The 't' was used to test ;The (t ±s) represent the measurement data; The 'X²' was used to test count data (%). P<0.05 was considered as statistically significant.

2. Results

Compared with the control group, the pain score of the intervention group was lower, the knee motion was greater, and the ADL score was higher. There was a significant difference in the treatment recovery between the two groups (P<0.05)

group	case	postoperative VAS score	postoperative ROM score	postoperative ADL score
intervention group	20	3.05±1.28	90.70±8.31	2.15±0.37
control group	20	3.8±1.32	76.20±7.66	2.40±0.50
't' value	-	-1.83	5.74	-1.8
'p' value	-	0.038	<0.001	0.040

The satisfaction of the intervention group was significantly higher than that of the control group, with statistical significance ($P < 0.05$).

3. Discussion

Through the data analysis of the two groups before and after the intervention in this study, we can conclude that active and effective perioperative psychological intervention plays a great role in promoting the rehabilitation process of patients with TKA.

Psychological intervention therapy (perioperative psychological support, using short-range psychotherapy, relaxation training, biofeedback therapy and so on) can effectively overcome the early postoperative patients with fear psychology, mood stable patients, and to give patients the largest degree of confidence, enhance the patient's cooperation degree, greatly enhance the feasibility of the various rehabilitation program;

The pain score of the intervention group was lower than that of control group, so we can say that psychological intervention therapy has a very positive effect on relieving patients' pain problems after surgery and during rehabilitation and helps to improve pain tolerance. The knee motion was greater than that of control group, and the ADL score was higher than that of control group. This statistic data illustrate that timely psychological intervention can also contribute to the recovery of the overall body function of patients, and increase the stability, weight-bearing capacity, movement of patients' joints and core muscles. Patients' ability to survive and take care of themselves is improved as a result. These methods lay a solid foundation for a series of rehabilitation processes like walking training, and promote patients' self-care ability in daily life.

References

- [1] Tang, X., Wang, S.F., Zhan, S.Y., et al. The Prevalence of Symptomatic Knee Osteoarthritis in China Results From the China Health and Retirement Longitudinal Study [J]. *Arthritis & rheumatology.*, 2016, 68 (3): 648-653. DOI:10.1002/art.39465.
- [2] Wu, F., Liu, L., Li, L., The application of rapid rehabilitation surgical nursing concept in the perioperative period of total knee arthroplasty [J]. *Journal of Contemporary Clinical Medicine*, 2021, 34(04):41+35.
- [3] Pan, Y.Y., Cheng, Y.Q., Zhang, P., Wang, H., et al. Effects of preoperative pain cognitive education on negative emotions and postoperative pain in patients undergoing orthopaedic surgery [J]. *Journal of International Psychiatry*, 2016, 43(06): 1096-1099. DOI:10.13479/j.cnki.jip.2016.06.040.
- [4] Otto F. Kernberg. An Innovative Brief Psychodynamic Psychotherapy[J]. *Journal of the American Psychoanalytic Association*, 2015, 63(5) : 929-936.
- [5] Zheng, N., Application of Eye Movement Desensitization and Reprocessing (EMDR) [J]. *Chinese Mental Health Journal*, 1997(04):58.
- [6] Christanell F., et al. The influence of electromyographic biofeedback therapy on knee extension following anterior cruciate ligament reconstruction: a randomized controlled trial[J]. *Sports Medicine, Arthroscopy, Rehabilitation, Therapy and Technology (SMARTT)*, 2012, 4(1) : 41.