

Original Article

Effect of psychological intervention care on the negative mood and hope level of elderly patients undergoing knee arthroplasty

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Abstract: Objective: We explored the influence of psychological intervention care on the negative mood and hope level of elderly patients undergoing knee arthroplasty. Methods: A total of 98 elderly patients undergoing knee arthroplasty in our hospital were randomly divided into a control group and an observation group, each with 49 people. The control group was given routine nursing care, and the observation group was given psychological intervention care plus routine nursing care. In the study, we compared the negative mood (Emotional distress Index Scale), preoperative hope level, quality of life, Range of Motion (ROM) of the knee, score of Hospital for Special Surgery (HSS), and satisfaction in the two groups of patients. Results: Patients in the observation group had lower Xinqing index scores than the control group ($P<0.001$). The scores of preoperative hope level in the observation group were higher than those of the control group ($P<0.001$). The scores of physical function, general health, social function, emotional role, and mental health were higher in the observation group than in the control group (all $P<0.01$). The ROM scores of patients in the observation group were higher than those of the control group ($P<0.001$). The HSS scores of patients in the observation group were higher than those of the control group ($P<0.001$). The patients in the observation group were significantly more satisfied with the care during hospitalization than the control group. Conclusion: Psychological intervention care was effective for elderly patients undergoing knee arthroplasty. It could improve patients' negative mood, hope level, quality of life, and rehabilitation effects, and is worthy of clinical promotion and application.

Keywords: Knee arthroplasty, elderly, psychological intervention care, hope level, negative mood

Introduction

The knee joint is an important weight-bearing joint of the lower limbs, and degenerative osteoarthritis of the knee is a common condition that aggrieves the elderly [1]. Studies have illustrated that the prevalence of symptomatic knee osteoarthritis in the elderly is 35% in men and up to 74% in women [2, 3]. Knee arthroplasty can relieve pain, improve function, correct deformity, and obtain long-term stability, and is one of the most effective methods for treating osteoarthritis of the knee. With the increasing trend of aging in China, the number of knee arthroplasty procedures has increased dramatically [4, 5]. Quite a few studies have shown that knee arthroplasty has a high clinical value of application and the procedure is relatively mature and safe. However, underlying dis-

eases, low immunity, lack of relevant knowledge, and fear of postoperative outcomes and complications would lead to negative mood [6, 7]. Studies have demonstrated that negative mood can directly affect surgical outcome and prognosis [8]. Patients with a high hope level (expectation of surgical outcome) have better surgical cooperation and are more willing to adopt beneficial coping strategies. The higher the hope level, the better the outcome after surgery [9]. Therefore, improving patients' negative mood as well as their hope level have become a focus of clinical nursing attention. Psychological nursing intervention refers to pouring attention into the patient's psychological condition in the process of nursing. With psychology as theoretical guidance, nurses' languages, expressions, attitudes, postures and behaviors are used to improve patient's unhealthy mental state.

This can improve the effect, recovery and prognosis of the disease, as well as increasing the satisfaction of patients and society [10]. Psychological intervention care has been applied to the nursing of elderly patients undergoing knee arthroplasty at home and abroad, which improves patients' negative mood and quality of life. However, the studies did not pay attention to elderly patients and their hope level [10, 11]. Therefore, in this study, we mainly explored the effect of psychological intervention care model in the nursing of elderly patients undergoing knee arthroplasty. We attached importance to examining the effects of this model on patients' negative mood, hope level, quality of life, Range of Motion (ROM) of the knee, Hospital for Special Surgery (HSS) scores and satisfaction, which is expected to provide theoretical guidance for clinical care.

Materials and methods

General information

In this prospective study, a total of 98 elderly patients undergoing knee arthroplasty who were admitted to our hospital from June 23, 2019 to June 23, 2020 were randomly divided into an observation group (n=49) and control group (n=49). The general information of the two groups of patients is shown in Results 2.1. This study was approved by the Medical Ethics Committee of our hospital and the patients signed informed consent.

Patients who were included: patients required knee arthroplasty due to intractable pain that had failed conservative treatment [12]. Patients older than 70 years; Patients without history of knee surgery; Patients without abnormalities in coagulation function, blood and urine routine, erythrocyte sedimentation rate and electrocardiogram; Patients with normal cognitive function.

Patients who were excluded: patients with a history of surgical procedures; patients combined with severe cardiac, hepatic, and renal disorders; patients with a history of psychiatric disorders; patients with cognitive impairment; patients with knee infections, gastrointestinal bleeding, active peptic ulcers and neuromuscular defects; patients administered medication for pain or abuse of alcohol for a long time.

Methods

The control group received routine care which included health education, cardiac monitoring, and close observation of changes in the heart rate, blood pressure, and other physical indicators. Medical staff would establish intravenous access for patients, give them nutritional support, and guide postoperative rehabilitation training.

The observation group implemented psychological intervention care on the basis of the control group with five specific measures [10]. The first was the formation of a psychological care team, which consisted of an attending physician, a nurse practitioner, two nursing team leaders, and a nurse practitioner in charge. The second was preoperative psychological care. Before operation, patients and families were instructed about the surgery, which could correct patients' and families' misconceptions about the disease and surgery, and also relieve psychological stress and anxiety. The patient's family members were asked to pay close attention to the patient's psychological status and reported to the supervising nurse if they found that the patient was inclined to anxiety or depression. The nurse-in-charge would then patiently communicate with the patient and family members about past successful cases to enhance their confidence in the surgery and to accept the surgery with a positive and optimistic attitude. The patient's family members were motivated to provide moral support and a major impetus for the patient to overcome the disease, in addition to taking care of the patient after admission. The third was intraoperative psychological care. Before the patient was wheeled into the operating room to go under anesthesia, the medical staff would communicate patiently with the patient to make them relaxed. The fourth was postoperative psychological care. The medical staff would patiently interpret the possible complications and treatment methods. Medical staff would also organize patients to watch videos and materials of postoperative limb function changes of patients with successful operations to enhance their confidence in recovery. The fifth was to teach patients the methods of relaxation, including massage, deep breathing, listening to music, laughing loudly, mental guidance, and meditation training.

Outcome measures

Primary outcome measures: To compare the negative mood of the two groups, we used a homemade Emotional-distress Index Scale to assess the states of anxiety, depression, and related psychology of the patients [13]. The scale had 11 items in total. Among items 1-9, 4 items were used to assess anxiety symptoms, 4 items were used to assess depression symptoms, 1 item was used to assess suicidal tendencies. Items 10 to 11 were additional items. The scale had a total score of 0 to 45 points. The higher the score, the more severe the negative mood of the patients was. The validity of the scale was 0.876 and the reliability was 0.885.

To compare the preoperative hope level of the two groups of patients, we used the Herth Hope Index Scale to assess the hope level of the patients. The scale included 12 items and 3 dimensions (positive attitude towards reality and the future, taking positive actions, and maintaining close relationships with others). The higher the score, the higher the hope level was [9].

Secondary outcome measures: Medical Outcomes Study 36-Item Short-Form (MOS SF-36) was used to compare the quality of life of the two groups of patients. The scale included five dimensions of physical function, general health, social function, emotional role, and mental health. The full score of each dimension was 100 points. The higher the score, the higher the quality of life in the relevant dimensions was [14].

To compare the ROM of the knee joint between the two groups, the doctor measured the angle between the greater trochanter to the lateral epicondyle of the femur and the projection of the medial tibial condyle to the medial malleolus on the lateral wall of the lower limb [15].

We compared the HSS scores of the two groups of patients, which included pain, function, ROM, muscle strength, flexion deformity, and stability. The total score was 100 points. The higher the score, the better the functional recovery was [16].

Patients were asked to fill out our homemade satisfaction questionnaire to assess nursing

satisfaction, which was divided into satisfied (90-100 points), basically satisfied (60-89 points), and dissatisfied (<60 points). Satisfaction = (satisfied + basically satisfied) number of cases/total number of cases × 100%.

Statistical analysis

SPSS 22.0 was used for data statistics in the current study. The counted data were expressed as $n/\%$, and the difference was compared with the χ^2 test. Measured data conforming to normal distribution were expressed as mean \pm standard deviation ($\bar{x} \pm sd$), and independent t test was used for comparison between groups. Rank sum test was used to compare the composition of graded data groups. $P < 0.05$ was considered significant.

Results

Comparison of baseline data between the two groups

There was no statistically significant difference between the two groups of patients in age, gender, weight, ASA classification, operation time, educational level, comorbidities, and reasons for operation (all $P > 0.05$), and comparisons between the two groups were possible, as shown in **Table 1**.

Comparison of negative mood between the two groups of patients

Mean score of Emotional distress index of the observation group was lower than that of the control group (7.75 ± 2.01 vs. 11.76 ± 2.24), and $t = 9.327$, $P < 0.001$, as shown in **Figure 1**.

Comparison of the hope level of the two groups of patients

The preoperative hope level score of the observation group was higher than that of the control group (37.70 ± 4.54 vs. 31.76 ± 3.89), and $t = 6.955$, $P < 0.001$, as shown in **Figure 2**.

Comparison of the quality of life of the two groups of patients

Compared with the control group, the scores of physical function, general health, social function, emotional role, and mental health of the observation group were higher than those of

Table 1. Comparison of baseline data between the two groups of patients (n, $\bar{x} \pm sd$)

Index	Observation group (n=49)	Control group (n=49)	χ^2/t	P
Age (years)	76.6±6.2	78.6±7.9	1.415	0.160
BMI (kg.m ²)	22.75±2.05	22.51±3.03	0.523	0.610
Gender			0.166	0.683
Male (n)	22	20		
Female (n)	27	29		
Weight (kg)	70.50±6.98	69.54±7.16	0.672	0.503
ASA classification			0.915	0.338
Grade I (n)	12	14		
Grade II (n)	37	35		
Operation time (minutes)	110.50±11.98	112.52±10.18	0.899	0.371
Educational level			1.085	0.297
Below high school (n)	28	33		
High school and above (n)	21	16		
Comorbidities				
Hypertension (n)	13	18	1.179	0.277
Diabetes (n)	3	4	0.153	0.694
Other medical diseases (n)	5	7	0.379	0.537
Reasons for operation			1.670	0.433
Osteoarthritis (n)	23	27		
Rheumatoid arthritis (n)	14	15		
Traumatic arthritis (n)	12	7		

Note: BMI: Body Mass Index.

the control group, and (all $P < 0.01$), as shown in **Table 2**.

Comparison of ROM of knee between the two groups

The ROM of the observation group was higher than that of the control group (110.30 ± 11.53 vs. 94.16 ± 10.82), and ($t = 7.145$, $P < 0.001$), as shown in **Figure 3**.

Comparison of HSS scores between the two groups

The HSS score of the observation group was higher than that of the control group (85.30 ± 8.50 vs. 75.16 ± 7.89), and ($t = 6.120$, $P < 0.001$), as shown in **Figure 4**.

Comparison of nursing satisfaction between the two groups

In the observation group, 24 patients were satisfied with the nursing care during the hospitalization, 21 were basically satisfied, and 4 were

dissatisfied. The satisfaction rate of the observation group was 91.84%. In the control group, 18 patients were satisfied with the nursing care during the hospitalization, 18 patients were basically satisfied, and 13 were dissatisfied. The satisfaction rate of the control group was 73.47%. The satisfaction rate of patients in the observation group with nursing care during the hospitalization was significantly higher than that of the control group ($P < 0.05$), as shown in **Table 3**.

Discussion

Since its introduction into the clinic, psychological intervention care has been widely used in the care of critical illnesses, post-surgical and chronic diseases, achieving favorable results and improving the

prognosis and quality of care [17-19]. Patients with a more negative mood may experience intense, excessive, and persistent worry and fear, along with adverse mental states such as depression, grief, low self-esteem, and pessimism. If such emotions persist, they can lead to psychotic symptoms such as increased heart rate, rapid breathing, sweating, trembling, weakness, fatigue, sleep difficulties, hallucinations, delusions, and intestinal problems, which can even interfere with the patient's daily activities [8]. Studies have demonstrated that 20% to 25% of knee arthroplasty patients have psychological problems and that patients often have anxiety and depression due to long-term pain and limited function [10]. Another study concluded that preoperative and postoperative anxiety and depression can affect patients' postoperative functional recovery [20]. In the current study, the observation group adopted the psychological intervention care model and compared it with the conventional care model in the control group. Results showed that the scores of the Emotional distress index of the

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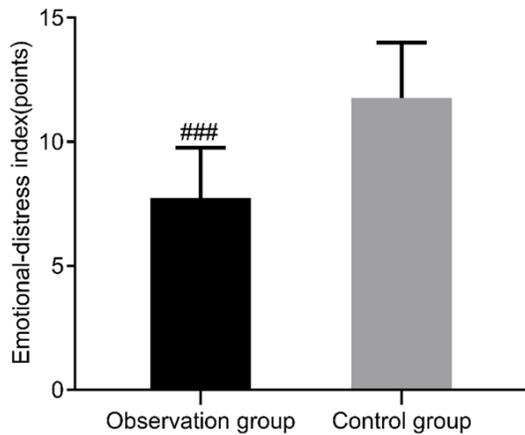


Figure 1. Comparison of emotional-distress index score between the two groups. Compared with the control group, ### $P < 0.001$.

patients in the observation group were lower than those of the control group, indicating that the psychological intervention care model could reduce the anxiety and depression of patients. The above findings were consistent with the conclusion of Li et al. and Liu et al. [10, 21]. This might be due to preoperative health education on knowledge of the disease, the necessity of knee replacement surgery, and postoperative complications, which allowed patients to actively cooperate with treatment and establish confidence. At the same time, the medical staff will pay close attention to the patients' emotions after surgery and give psychological guidance for the emergence of anxiety and depression, which can eliminate negative mood after surgery.

The hope level refers to the target level that an individual self-estimates to achieve before engaging in a certain action [22]. Studies have illustrated that the hope level affects the functional recovery, pain level, and postoperative satisfaction of TKA patients. Among 108 leukemia patients with the control group given conventional care, and the observation group given psychological care on the basis of the control group, Wang found that psychological care could improve patients' hope level [17]. Among 134 patients with uterine fibroids, Chen gave both groups of patients routine nursing intervention [18]. On this basis, the observation group was given targeted psychological intervention, and they finally concluded that targeted psychological intervention can effectively

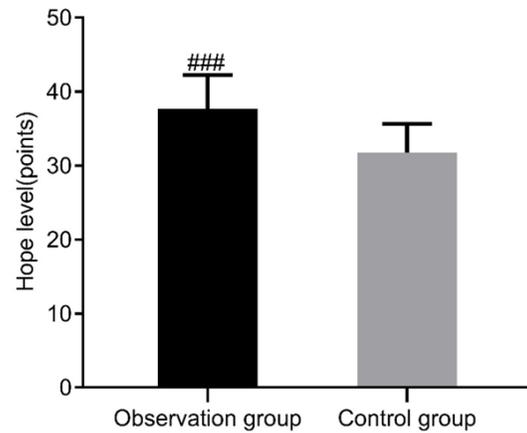


Figure 2. Comparison of hope level between the two groups. Compared with the control group, ### $P < 0.001$.

improve the patients' hope level. In the current study, the psychological intervention care model was used in the observation group and compared with the conventional care model in the control group. It was found that the hope level of the patients in the observation group was higher than that of the control group, which meant that the psychological intervention care model could improve the hope level of the knee replacement patients. This might be because psychological intervention improved negative preoperative mood, which made patients more willing to adopt a positive mindset to face the disease and surgery, and had higher hopes for postoperative results.

Both ROM and HSS were indicators to evaluate the rehabilitation effect of patients after knee arthroplasty, and these two indicators were used to assess the intervention effect of psychological care in the current study [23]. Chen et al. concluded that psychological care intervention could accelerate the functional rehabilitation of the knee joint in patients after total knee arthroplasty [11]. In the current study, the psychological intervention care model was used in the observation group and compared with the conventional nursing model in the control group. The results revealed that the patients in the observation group had higher ROM and HSS scores than those in the control group, indicating that the psychological nursing intervention model could improve the rehabilitation outcome of knee replacement patients. The psychological intervention probably reduced negative mood of patients before

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Table 2. Comparison of quality of life (MOS SF-36) between the two groups ($\bar{x} \pm sd$, scores)

Quality of life score	Observation group (n=49)	Control group (n=49)	t	P
Physical function	79.64±9.46	64.57±8.30	8.382	0.000
General health	92.66±11.24	84.00±12.57	3.595	0.001
Social function	73.88±10.32	64.26±9.56	4.787	0.000
Emotional role	63.03±8.93	54.96±6.91	5.003	0.000
Mental health	68.89±9.40	56.06±6.94	7.686	0.000

Note: MOS SF-36: Medical Outcomes Study 36-Item Short-Form.

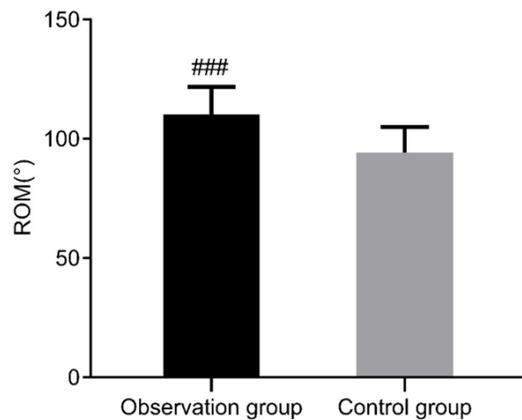


Figure 3. Comparison of ROM scores between the two groups. ROM: Range of Motion. Compared with the control group, ###P<0.001.

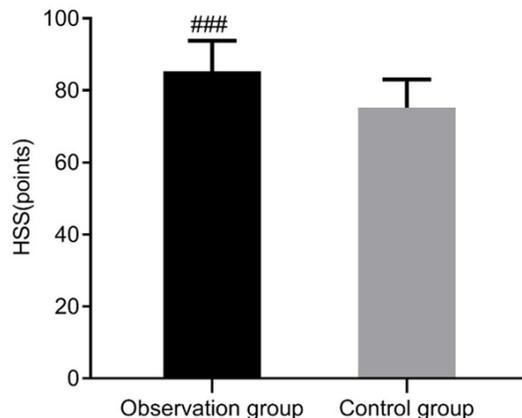


Figure 4. Comparison of HSS scores between the two groups. HSS: Hospital for Special Surgery. Compared with the control group, ###P<0.001.

and after surgery, increased hope level and reduced pain perception, which helped them actively participate in rehabilitation training. Studies have shown that patients undergoing knee replacement surgery have already painful

and limited movement in the joint before surgery. Postoperatively, they were often associated with complications such as pain, deep vein thrombosis, poor incision healing, and peri-prosthetic infection, which in turn affected their quality of life [24]. In the current study, the observation group got the qualified care model compared with the conventional care model of the control group. The results revealed that the scores of all dimensions of quality of life of patients in

the observation group were higher than those of the control group, indicating that the psychological intervention care model could improve the quality of life of patients after knee replacement surgery, which may reflect improved rehabilitation outcome of patients.

Finally, this study also examined the nursing satisfaction of patients in both groups, and found that the nursing satisfaction of patients in the observation group was significantly higher than that of the control group. This may be due to the fact that the psychological intervention care reduced patients' pain, anxiety, and depression, improved the outcome of recovery, quality of life, and clinical prognosis, and therefore they had a better subjective experience of medical care. However, this study had shortcomings such as small sample size, single-center study, and short follow-up time, and did not observe the status of patients' anxiety and depression, and negative mood of the core family members after discharge from the hospital. A large sample of long-term care outcome studies should be conducted later to confirm the feasibility and importance of the psychological intervention care model in knee arthroplasty patients.

In conclusion, psychological intervention care is effective in elderly patients with knee arthroplasty. It can improve patients' negative mood, hope level, quality of life and rehabilitation effects, and is worthy of clinical promotion and application.

Disclosure of conflict of interest

None.

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Table 3. Comparison of nursing satisfaction between the two groups of patients (n, %)

Group	Satisfied	Basically satisfied	Dissatisfied	Satisfaction rate
Observation group (n=49)	24 (48.98)	21 (42.86)	4 (8.16)	45 (91.84)
Control group (n=49)	18 (36.73)	18 (36.73)	13 (26.53)	36 (73.47)
U/ χ^2		5.852		5.764
P		0.053		0.016

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References

- [1] Deng Z, Li Y, Storm GR, Kotian RN, Sun X, Lei G, Gao S and Lu W. The efficiency and safety of steroid addition to multimodal cocktail periarticular injection in knee joint arthroplasty: a meta-analysis of randomized controlled trials. *Sci Rep* 2019; 9: 7031.
- [2] Bhattarai MD. Osteoarthritis of the knee. *Lancet* 1997; 350: 1327-1328.
- [3] Kim MS, Cho RK and In Y. The efficacy and safety of polydeoxyribonucleotide for the treatment of knee osteoarthritis: systematic review and meta-analysis of randomized controlled trials. *Medicine (Baltimore)* 2019; 98: e17386.
- [4] Mishra A, Awasthi S, Raj S, Mishra P and Srivastava RN. Identifying the role of ASPN and COMP genes in knee osteoarthritis development. *J Orthop Surg Res* 2019; 14: 337.
- [5] Yuan T, Xiong J, Wang X, Yang J, Jiang Y, Zhou X, Liao K and Xu L. The effectiveness and safety of moxibustion for treating knee osteoarthritis: a PRISMA compliant systematic review and meta-analysis of randomized controlled trials. *Pain Res Manag* 2019; 2019: 2653792.
- [6] Lin Y, Bai YG, Zhu YH, Yin L, Li X and Zheng R. Effect of CCM combined with CPM on function rehabilitation of elderly patients after TKA. *J Guangxi Med Univ* 2020; 37: 178-182.
- [7] Lin WJ, Lin SY, Zeng QY and Wang YL. Effect of physical therapy on elderly patients after total knee arthroplasty: a case report. *Chin J Rehabil Med* 2020; 35: 855-857.
- [8] Zhang L, Gao L, Jin X and Zhao F. Influencing factors after total knee arthroplasty in patients with osteoarthritis under different psychological states. *Hebei Med J* 2020; 42: 910-913.
- [9] Xin P, Zhang H and Jiang YJ. The relationship between quality of life and hope level on bladder carcinoma patients. *J Mod Oncol* 2019; 27: 1172-1175.
- [10] Li J and Yi CF. Influence of psychological nursing interference on improvement of prognosis of old patients receiving total knee arthroplasty. *Nurs Pract Res* 2017; 14: 130-132.
- [11] Chen ZZ, Yang JJ and Lv C. Effect of preoperative psychological evaluation combined with psychological intervention nursing on postoperative pain after total knee arthroplasty. *Chongqing Med J* 2017; 46: 180-181.
- [12] Cozzi Lepri A, Innocenti M, Matassi F, Villano M, Civinini R and Innocenti M. Accelerometer-based navigation in total knee arthroplasty for the management of extra-articular deformity and retained femoral hardware: analysis of component alignment. *Joints* 2019; 7: 1-7.
- [13] Deng XX, Fang RH, Mao Y and Song HX. Study on anxiety and depression of elderly inpatients in general wards of general hospitals and its influencing factors. *Chin Gen Pract* 2020; 23: 96-100.
- [14] Vitorino DFdM, Martins FLM, Souza ADC, Galdino D and Prado GFD. Utilizao do SF-36 em ensaios clínicos envolvendo pacientes fibromiálgicos: determinao de critérios mínimos de melhora clínica. *Revista Neurociências* 2019; 12: 147-151.
- [15] Olson MW. Static loading of the knee joint results in modified single leg landing biomechanics. *PLoS One* 2020; 15: e0219648.
- [16] Wang F, Zhou Y, Sun J and Yang C. Influences of continuous femoral nerve block on knee function and quality of life in patients following total knee arthroplasty. *Int J Clin Exp Med* 2015; 8: 19120-19125.
- [17] Wang LH. Analysis of psychological nursing on hope level and psychological state of leukemia patients undergoing chemotherapy. *Guizhou Med J* 2019; 43: 129-130.
- [18] Chen Y. Effect of targeted psychological intervention on negative emotion, hope level and quality of life of patients with hystero myoma. *Med Clin Res* 2019; 36: 2271-2273.
- [19] Guo SJ, Huang ML, Ling R and Zhu L. Clinical efficacy of psychological intervention on leukemia patients: meta-analysis. *Med J West Chin* 2019; 31: 455-460, 464.
- [20] Zhang LS and Liu M. Effect of negative emotions on functional recovery and quality of life of patients after total knee arthroplasty. *Hebei Med* 2016; 38: 41-44.
- [21] Liu XL, Zhang HX, Peng T, Liang ZB and Chen QL. Effect of perioperative psychological nursing on patients undergoing total knee arthroplasty. *Chin Gen Pract* 2010; 13: 79-80.

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- [22] Shang XC, Lin Z, Bian QG, Wang MF, Lin L and Zhang HJ. Study on hope level of patients with inflammatory bowel disease and its influencing factors. *Chin Nurs Res* 2019; 33: 1665-1669.
- [23] Zhang L, Wang LS, Zhang R and Yang L. Comparison of the effects of two different prostheses on ROM, HSS scores and high flexion mobility after total knee arthroplasty. *J Clin Exp Med* 2018; 17: 1983-1986.
- [24] Flierl MA, Sobh AH, Culp BM, Baker EA and Sporer SM. Evaluation of the painful total knee arthroplasty. *J Am Acad Orthop Surg* 2019; 27: 743-751.