

Effects of mindfulness therapy on patients with kinesiphobia after total hip replacement

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Abstract: In order to explore the effect of mindfulness therapy on depression, anxiety and sleep index in patients with kinesiphobia after total hip replacement. We collected 122 patients with kinesiphobia after total hip replacement in the rehabilitation department from October 2020 to August 2021. And we randomly divided them into a control group and a mindfulness therapy treatment group using the odd-even number method, with 61 cases in each group. Patients in the control group received routine care, and the mindfulness therapy treatment group received mindfulness therapy treatment on the basis of routine care in the control group. The t test was used to compare the TSK, Self-rating Depression Scale (SDS), Self-rating Anxiety Scale (SAS) and Pittsburgh Sleep Quality Index (PSQI) scores between the two groups before and after treatment. Resultly, before treatment, there was no statistically significant difference in SDS, SAS, and PSQI scores between the two groups ($P>0.05$). After mindfulness therapy treatment, the TSK, SDS, SAS, and PSQI scores of the mindfulness therapy treatment group were respectively lower than the control group after conventional treatment, and the difference was statistically significant ($P<0.05$). In conclusion, mindfulness therapy can alleviate patients' fear of movement, reduce anxiety and depression levels, improve sleep quality, and promote patients' psychological recovery.

1. Introduction

Total hip replacement is a new surgical method developed in modern times for the treatment of hip and femoral head diseases. This surgery can effectively remove joint lesions, reduce hip pain symptoms, correct joint deformities, and thus ensure the patient's hip joint movement function of recovery. Studies have shown that early functional exercise can extend the service life of prostheses, prevent patients from postoperative lower limb muscle atrophy and joint adhesions, and improve the stability of the hip joint [1, 2]. Kinesiphobia is a clinical manifestation in which an individual's threshold for pain is lowered, sensitivity is increased, and abnormal body movement occurs after being exposed to external stimulation or injury. About 50% of patients after total hip replacement have kinesiphobia scores higher than normal [3]. Moreover, kinesiphobia can easily lead to negative emotions such as anxiety and depression in patients, triggering a vicious cycle of patients avoiding postoperative rehabilitation exercises and affecting the recovery of postoperative hip joint function

[4]. Mindfulness therapy is a commonly used psychological intervention method (Figure 1). It aims to give patients a positive social psychological orientation, conscious awareness, living in the present and non-judgment, thereby alleviating the patient's painful emotions and thoughts, and changing them in the near future. And shape a positive life direction and conscious attitude [5]. Research has found [6-7] that mindfulness therapy can cause plastic changes in the structure and function of brain areas involved in the regulation of attention, emotion, and self-awareness of participants. It may also promote emotional regulation by improving the ability of cognitive reappraisal, and through reducing the negative aspects of psychological distress by reducing anxiety, depression, and pain, and mindfulness therapy can promote pain reduction, concentration, sleep, and a sense of well-being. At present, mindfulness therapy has demonstrated great psychological adjustment and healing effects in the practice of mental health promotion. The purpose of this study was to study the impact of mindfulness therapy on the psychological rehabilitation of patients with kinesiphobia after total hip replacement, so as to improve the patients' mental health.



Figure 1: Mindfulness therapy

2. Materials and methods

2.1. General information

A total of 122 total hip replacement patients who were admitted to the rehabilitation department of a hospital in Shaanxi Province from October 2020 to August 2021 were selected and randomly divided into a control group and a mindfulness therapy treatment group using the odd-even number method, with 61 cases in each. There were 25 males and 18 females in the control group, aged from 20 to 80 years old, with an average age of 38.78 ± 10.39 years. There were 27 males and 16 females in the mindfulness therapy treatment group, aged 20 to 81 years old, with an average age of 39.02 ± 10.27 years. There was no statistical difference in the general clinical data of the two groups of patients, such as education level, economic income, marital status, occupation, etc. ($P > 0.05$), and they were comparable. The two groups of patients were separated from each other in different wards, and the patients in the control group and the mindfulness therapy group did not know each other's treatment methods. This study is an interventional study. The purpose and method of treatment were explained to the patients and their families. The consent of the immediate family members was obtained and an informed consent form was signed. This study has been approved by the hospital ethics committee.

Inclusion criteria: (1) Patients undergoing total hip replacement surgery were included; (2) Patients who were cured after surgery, had good compliance, were able to communicate normally and had no language communication disorders were included; (3) Patients with no previous depression, anxiety, or poor sleep quality were included; (4) Patients who had complete clinical data and obtained family notification and consent forms were included. Exclusion criteria: (1) Patients with a past history of mental illness and cognitive dysfunction were excluded; (2) Patients with other fractures, serious heart, lung, liver and kidney diseases and tumors were excluded; (3) Patients who were engaged in psychological work were excluded; (4) Patients who dropped out midway or had severe Pain, frequent

or severe physical symptoms (such as extreme concern about pain, fatigue, dizziness or other negative physical experiences) were excluded; (5) Patients who completely withdraw from society or failed to answer questions, with high risk of self-harm or participating in other psychosocial interventions or clinical trials currently were excluded.

2.2. Method

The control group received routine care for patients after total hip replacement in the rehabilitation department. The vital signs of the patients were closely monitored after hospitalization. After the vital signs were stable, the wards were arranged reasonably, a comfortable, quiet, and dry ward environment was provided, and related complications were actively prevented. Routine publicity after hospitalization: (1) We used easy-to-understand language to explain the importance of disease treatment and recovery to patients, encouraging patients to build self-confidence and get out of depression; (2) We established a good nurse-patient relationship, and imparted various disease care knowledge and skills. And we improved awareness, eased emotions, and helped patients to establish a positive outlook on life and outlook on life; (3) We distributed total hip replacement post-operative care manuals to patients and explained relevant knowledge; (4) We strengthened publicity to accompanying family members about total hip replacement post-operative care knowledge and skills. We cooperated with medical workers to eliminate patients' irritability, depression, pessimism and other negative emotions as much as possible. The mindfulness therapy treatment group added 4 weeks of mindfulness therapy to routine care. Establish a mindfulness therapy team with at least 3 members: (patient) attending physician, (patient) nurse in charge, and senior psychotherapist. Members of the mindfulness therapy team must systematically study mindfulness therapy-related knowledge and understand its influencing factors and domestic trends. Development, etc., must be members who have passed the corresponding theoretical and practical assessment of mindfulness therapy and are qualified.

2.2.1. The first week after the patient is admitted to hospital

The attending physician explains to the patient and accompanying family members about the complications related to total hip replacement surgery. The attending physician and the nurse in charge inform the importance of active cooperation in treatment and care; the psychotherapist systematically Explain the theoretical knowledge of mindfulness therapy, explain mindfulness therapy in multiple ways such as video, audio, etc., establish mindfulness thinking, and make patients willing to accept mindfulness therapy and conduct mindfulness therapy training. The training is conducted in a dedicated treatment room in a quiet, dry and comfortable environment, with at least 2 members of the treatment team participating. The treatment content of mindfulness therapy is as follows. (1) Meditating and feeling your body: we instructed the patient to close his eyes, sit still, concentrate. And then we scanned the body in order from the top of patient's head, made him feel every change, such as heart, blood vessel pulsation, limb movements, etc. (2) Breathing training: The patient closed his eyes, concentrates, and moved his awareness with the inhalation and exhalation. And we made him feel the feeling and speed of the outflow, the inflow of airflow, and the size of the airflow. (3) Feeling and perception training: We instructed patients to perceive the beauty around them through sight, touch, taste, hearing, and smell, such as observing the bright colors of flowers, touching the people around them, listening to a favorite song, a favorite meal, etc. (4) Emotion management training: We provided psychological counseling and guided patients to stay optimistic, do things within their own capabilities, cultivate self-confidence, treat external things with a positive attitude, and eliminate external interference factors as much as possible. (5) Attention training: We strengthened the patient's attention focus, trained him to pay attention to a certain thing. and to use

different aspects of the body to feel it, such as touch, verbal description, etc. And we suggest patient to speak out the experience and associate it with beautiful things.

2.2.2. The second week after admission

(1) We guided patients to always be aware of changes in your inner emotions and practice loving-kindness meditation for 10 minutes; (2) For the meditation walking training, we guided patients to meditate in their mind on how to walk, how to control their body step by step and how to swing; (3) For the mindfulness therapy activities (Breathing space lasting for 3 minutes), we guided patients to actively communicate with members of the treatment team in a pressure environment with a certain setting. And we improved their ability to reduce stress in a stressful environment, encouraged them to raise the issues they encountered, share the issues with the treatment team, work hard to make more improvements and improvements next time.

2.2.3. The 3rd week after admission

(1) We guided patients through physical sensations, breathing training and meditation; (2) We guided patients through nature meditation, controlling emotions and the correct method of sitting meditation; (3) We guided patients to add breathing, movement, posture, thinking and emotions to their own meditation; (4) We communicated with members of the treatment team to raise issues and correct issues.

2.2.4. The 4th week after admission

We strengthened and consolidated the previous training content, and gradually allowed patients to further develop the methods and concepts of this mindfulness therapy treatment. So that patients could accept themselves more calmly and control their emotions, and changed the symptoms caused by total hip psychological distress after joint replacement. In the later period, we actively communicated with members of the treatment team or mindfulness therapy team through WeChat, phone and etc. to share the results.

2.3. Observation indicators

(1) The self-rating anxiety scale (SAS) or the self-rating depression scale (SDS) consists of 20 items, with the score range of each item being 1 to 4. The total score is multiplied by 1.25 and then converted to a standardized score ranging from 25 to 100, with higher scores indicating more severe anxiety and depression. The severity standards used are as follows: mild anxiety (50 to 60 points) and mild depression (53 to 62 points), moderate anxiety (61 to 70 points) and moderate depression (63 to 72 points), and severe anxiety (61 to 72 points). Score above 70) and severe depression (score above 72) [8]. (2) Kinesiophobia Rating Scale (tampa scale of kinesiophobia, TSK), this scale has 17 items in total, each item is scored according to the Likert 4-point scoring method, 1 to 4 points from strongly disagree to strongly agree, ≥ 37 points are enough It is judged as kinesiphobia and the higher the score, the higher the degree of kinesiphobia. Cronbach's Q value is 0.778, and this scale has good reliability and validity [9]. (3) The Pittsburgh sleep quality index (PSQI) is a self-reported questionnaire used to assess sleep quality. The total score ranges from 0 to 21, with higher scores indicating poorer sleep quality. The scale consists of 7 subscales, including subjective sleep quality, sleep latency, sleep duration, sleep efficiency, sleep disturbance, sleep medication use, and daytime dysfunction. A total PSQI score of 5 or above indicates poor sleep quality, and a score above 10 is considered a severe sleep disorder [10].

2.4. Statistical methods

The data were statistically analyzed using SPSS 25.0 software. Normal measurement data were represented by, and t test was used. $P < 0.05$ was considered as a statistically significant difference.

3. Results

3.1. Comparison of SAS, SDS and TSK scores between the two groups

There was no significant difference in the SDS, SAS, and TSK scores of the control group and the mindfulness therapy treatment group at admission ($P > 0.05$). The SDS, SAS, and TSK scores of the two groups at discharge were lower than those at admission, and the SAS of the mindfulness therapy treatment group was lower at discharge. SDS and TSK scores were all lower than those of the control group, with statistical differences ($P < 0.05$). See Table 1.

Table 1: Comparison of SAS, SDS and TSK scores between the two groups ($\bar{x} \pm s$)

group	number	SAS		SDS		TSK	
		at admission	at discharge	at admission	at discharge	at admission	at discharge
control group	61	55.41 \pm 3.88	51.90 \pm 3.79	56.39 \pm 4.18	52.20 \pm 3.61	43.33 \pm 2.97	40.27 \pm 3.04
treatment group	61	56.06 \pm 4.04	46.72 \pm 3.40	55.79 \pm 4.42	46.86 \pm 3.26	43.89 \pm 3.04	35.95 \pm 2.54
t		0.952	6.652	-1.978	6.872	0.314	9.063
P		0.346	<0.001	0.055	<0.001	0.755	<0.001

3.2. Comparison of PSQI scores between the two groups

There was no significant difference in the PSQI scores of the 7 sleep items in the control group and the mindfulness therapy treatment group at the time of admission ($P > 0.05$). At the time of discharge, the PSQI scores of the 7 items in both groups were lower than those at the time of admission, and 7 in the mindfulness therapy treatment group at the time of discharge. The project score and total score PSQI score were lower than those in the control group, with statistical differences ($P < 0.05$). See Table 2.

Table 2: Comparison of PSQI scores between the two groups ($\bar{x} \pm s$)

Project	at admission				at discharge			
	control group	treatment group	t	P	control group	treatment group	t	P
Sleep quality	1.67 \pm 0.60	1.65 \pm 0.62	-0.299	0.766	1.33 \pm 0.52	0.98 \pm 0.52	4.331	<0.001
Sleep latency	1.69 \pm 0.51	1.68 \pm 0.53	-0.531	0.598	1.34 \pm 0.52	1.01 \pm 0.61	4.667	<0.001
Length of ones sleep	1.64 \pm 0.55	1.65 \pm 0.57	0.213	0.832	1.36 \pm 0.44	1.00 \pm 0.53	3.126	0.003
Sleep efficiency	1.66 \pm 0.48	1.70 \pm 0.61	0.572	0.570	1.29 \pm 0.48	0.99 \pm 0.58	3.112	0.003
Sleep disorders	1.61 \pm 0.52	1.63 \pm 0.59	0.572	0.570	1.36 \pm 0.47	1.03 \pm 0.49	3.534	0.001
hypnotics	0.71 \pm 0.49	0.74 \pm 0.52	-0.298	0.767	0.49 \pm 0.22	0.32 \pm 0.20	2.672	0.011
Daytime function	1.65 \pm 0.53	1.66 \pm 0.56	0.283	0.670	1.22 \pm 0.55	0.82 \pm 0.49	5.247	<0.001
Total score	10.70 \pm 1.48	10.77 \pm 1.51	-0.102	0.917	8.45 \pm 1.34	6.09 \pm 1.44	11.137	<0.001

4. Discussion

Total hip replacement surgery has a certain impact on the normal life of patients, posing unique challenges to a person's physical function, social roles, interpersonal relationships, and psychological regulation, resulting in higher psychological pain and lower life satisfaction than the general population. If patients adapt to coping strategies such as active reconstruction, problem-solving, participating in physical rehabilitation, and seeking social support, they can generate positive emotions and the best quality of life. If they do not adapt to coping strategies such as denial, addiction to negative emotions, avoidance of social activities, and drug or alcohol abuse, they can lead to psychological distress, negative emotions, and poor quality of life. Research has demonstrated the effectiveness of commonly used biomedical, physical therapy, and psychosocial care in the rehabilitation of hospitalized patients after total hip replacement surgery. The patients with total hip replacement are mostly elderly, often accompanied by comorbidities and complications, which can affect the patient's compliance with rehabilitation training. Meanwhile, postoperative anxiety, pain, and low self-efficacy are also obstacles that affect patients' rehabilitation training. Research has shown that improving patients' self-efficacy and social support can increase their confidence in rehabilitation and promote rehabilitation training. The ability to transcend oneself is mainly manifested in three aspects: the patient's own feelings, their ability to regulate themselves, their willingness to share and help others, and their own beliefs. Therefore, nursing staff should not only pay attention to the patient's physical pain, but also meet their psychological needs, improve their self-transcendence ability, thereby improving their compliance with rehabilitation training and promoting their rapid recovery.

This study showed that anxiety and depression scores were higher in patients with kinesiphobia after total hip arthroplasty. The formation of kinesiphobia is not only caused by physical pain, but also the result of the superposition of physical and psychological factors [11]. Therefore, nursing staff should fully understand the patient's disease status, explain surgery-related knowledge to the patient before surgery, and eliminate the patient's fear of surgery. They should not only take appropriate measures to reduce the patient's pain, but also pay attention to the patient's psychological state, thereby promoting Rapid recovery from illness. Mindfulness therapy is effective in treating depression and anxiety. At the same time, mindfulness therapy can also improve sleep quality and has a great impact on the Insomnia Severity Index and the Pittsburgh Sleep Quality Index [12].

Mindfulness therapy helps patients accept their current situation and face changes in their body and surrounding environment with a peaceful mind through meditation and feeling the body, breathing training, perception training, emotion management training, strengthening the patient's attention focus, and meditation walking training. , eliminate irritable and pessimistic emotions, while building self-confidence and promoting mental health [13]. Mindfulness therapy is inexpensive, long-term effective, and easily available. Studies have shown that mindfulness therapy has beneficial effects on cognitive function, anxiety, depression, sleep quality, loneliness, post-traumatic stress disorder, cardiovascular disease, diabetes, rheumatoid arthritis. It has obvious therapeutic effects on Parkinson's disease, urge urinary incontinence and chronic pain [14-16]. Research has found [17] that mindfulness therapy training on imaging MRI led to reduced activation of the parietal operculum and visual cortex (cuneus) during cognitive challenges, showing changes in visual cortical connections and activation during focused attention. Enhancement, and the parietal operculum including the posterior insula are activated by pain. Research has found [17] that there is a connection between the anterior part of the insula and emotional awareness. Long-term mindfulness therapy can improve the ability to distinguish emotional states. This may be related to the fact that mindfulness therapy can increase the connection strength between the insula. The results of this study show that both groups can improve in depression, anxiety, stress perception and sleep quality. Conventional care plus

mindfulness therapy has lower scores in depression, anxiety, stress perception and sleep quality than conventional care. The effect is more obvious. In short, mindfulness therapy intervention for patients with kinesiophobia after total hip replacement can effectively reduce patients' anxiety and depression and improve their sleep quality. Considering that the sample size of this study is small and it is a single-center study, it is expected to expand the sample for further research in the future.

References

- [1] Wei Zhihua. *The effect of early systematic rehabilitation training intervention on joint function and quality of life after total hip arthroplasty in the elderly [J]. Henan Journal of Surgery*, 2020, 26(3):100-102.
- [2] Tan Chunni, Li Jinhong. *Beneficial to the Recovery of Hip Function in Patients after Hip Replacement by early Rehabilitation Exercises [J]. Genomics and Applied Biology*, 2019, 0(6):2869-2873.
- [3] Olsson Lars-Eric, Hansson Elisabeth, Ekman Inger, et al. *Evaluation of person-centred care after hip replacement-a controlled before and after study on the effects of fear of movement and self-efficacy compared to standard care [J]. BMC nursing*, 2016, 15(1):53.
- [4] Chen Hualiang, Zhou Lingjun. *Research progress in the treatment of hyperactivity disorder [J]. Fashion Baby*, 2021(2):246-247.
- [5] Yin Hongling, Liu Na, Liu Deying, et al. *Application progress of mindfulness therapy in patients with diabetes [J]. Psychologies*, 2021, 16(9):226-227.
- [6] Rinske A. Gotink, Rozanna Meijboom, Meike W. Vernooij, et al. *8-week Mindfulness Based Stress Reduction induces brain changes similar to traditional long-term meditation practice—A systematic review [J]. Brain and Cognition*, 2016, 108:32-41.
- [7] Garland Eric L, Hanley Adam, Farb Norman A, et al. *State Mindfulness During Meditation Predicts Enhanced Cognitive Reappraisal [J]. Mindfulness*, 2015, 6(2):234-242.
- [8] Liu Zhao, Yin Rong, Fan Ze, et al. *Gender Differences in Associated and Predictive Factors of Anxiety and Depression in People with Epilepsy [J]. Frontiers in psychiatry*, 2020, 11:670.
- [9] Hu Wen. *Cross-cultural Adaptation of Simplified Chinese Version of TSK/FABQ, and its Clinical Application in the Assessment of Fear Avoidance for Patients with Low Back Pain [D]. Shanghai: Second Military Medical University*, 2012.
- [10] Buysse Daniel J, Reynolds Charles F, Monk Timothy H, et al. *The Pittsburgh sleep quality index: A new instrument for psychiatric practice and research [J]. Psychiatry Research*, 1989, 28(2):193-213.
- [11] Miao Fangyuan, Sun Linjie. *The effect of cognitive behavioral intervention on postoperative phobia in patients with lower extremity fracture [J]. Electronic Journal of Practical Clinical Nursing Science*, 2020, 5(17):3+36.
- [12] Lu Junhua, Guan Hongjun, Hu Xinyu. *Influence of mindfulness decompression therapy on mental health and sleep quality of medical students [J]. China Journal of Health Psychology*, 2020, 28(11):1705-1710.
- [13] Lei Xuexue, Yu Ying, Zang Mingcui. *Research status and development trend of mindfulness decompression therapy for treating chronic diseases [J]. Chinese Journal of Gerontology*, 2016, 36(9):2297-2299.
- [14] Katarina Friberg Felsted. *Mindfulness, Stress, and Aging [J]. Clinics in Geriatric Medicine*, 2020, 36(4):685-696.
- [15] Qin Jie, Li Xiaobo, Bo Suping. *Research progress on the mechanism of mindfulness-based stress reduction and its application in chronic diseases [J]. China Journal of Health Psychology*, 2020, 28(10):1593-1597.
- [16] Zhang Jiayuan, Zhou Yuqiu, Zhang Quanzhi, et al. *The effect of mindfulness-based stress reduction on perceived stress, anxiety and depression in breast cancer patients [J]. Chinese Journal of Nursing*, 2015, 50(2):189-193.
- [17] Seminowicz D A, Burrowes S A, Kearson A, et al. *Enhanced mindfulness based stress reduction (MBSR+) in episodic migraine: a randomized clinical trial with MRI outcomes [J]. Pain*, 2020, 161(8):1837-1846.