

Correlation Between Osteoarthritis and Activity Limitation Activity-Enhancing

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ABSTRACT

This retrospective study explored the correlation between osteoarthritis severity and activity limitation, and evaluated activity-enhancing nursing interventions in 50 patients with osteoarthritis (January 2020-December 2023). Patients were divided into intervention group (n=25) and control group (n=25). The control group received routine nursing care, while the intervention group received additional activity-enhancing nursing interventions including graded activity training, assistive device guidance, and environmental modification advice. Primary outcomes included the correlation between osteoarthritis severity (Kellgren-Lawrence grade) and activity limitation (WOMAC physical function score), and the change in WOMAC physical function score at 8 weeks. Results showed a significant positive correlation between Kellgren-Lawrence grade and initial WOMAC physical function score ($r=0.75$, $p<0.01$). At 8 weeks, the intervention group had a significantly greater reduction in WOMAC physical function score compared to the control group (30.2 ± 6.8 vs 15.6 ± 5.9 , $p<0.01$). The intervention group also showed better performance in 6-Minute Walk Test (6MWT) distance, Timed Up and Go (TUG) test time, and patient-reported activity confidence (PAC) score ($p<0.05$ for all). Activity-enhancing nursing interventions effectively improve activity ability in patients with osteoarthritis and reduce activity limitation.

Keywords: Osteoarthritis; Larsen grade; Kellgren-lawrence grade; WOMAC physical function

Introduction

Activity limitation is a major disabling consequence of osteoarthritis, with 60-70% of patients reporting difficulty in daily activities such as walking, climbing stairs, and dressing¹. The degree of activity limitation is closely related to osteoarthritis severity, joint pain, muscle weakness, and psychological factors, requiring comprehensive nursing interventions to improve functional independence². This study aims to explore the relationship between osteoarthritis and activity limitation, and evaluate the effect of activity-enhancing nursing interventions, providing evidence for clinical nursing practice³.

Methods

Study design and participants

Retrospective analysis of 50 patients with radiographically confirmed osteoarthritis (knee: 35 cases, hip: 15 cases). Inclusion criteria: age 50-80 years; Kellgren-Lawrence grade I-IV; presence of activity limitation (WOMAC physical function score ≥ 20). Exclusion criteria: severe cardiovascular diseases, musculoskeletal disorders other than osteoarthritis, and cognitive impairment.

Grouping & interventions

Control subgroups: Routine nursing care, including health education, pain management, and basic mobility advice.

Intervention subgroups: On the basis of routine nursing, activity-enhancing nursing interventions were added:

- **Graded activity training:** Formulating individualized activity plans with progressive intensity and duration, starting from low-intensity activities (sitting to standing) and gradually transitioning to more complex activities (walking, stair climbing).
- **Assistive device guidance:** Assessing and recommending appropriate assistive devices (canes, walkers) to reduce joint load during activities, and training patients on correct usage.
- **Environmental modification advice:** Suggesting home modifications (installing handrails, raising toilet seats) to facilitate daily activities and reduce activity barriers.
- **Activity confidence building:** Using positive reinforcement and goal setting to enhance patients' confidence in performing activities.

Outcome measures

- **Primary:** Correlation between Kellgren-Lawrence grade and initial WOMAC physical function score; change in WOMAC physical function score (0-68, higher score indicates more severe activity limitation) at 8 weeks.
- **Secondary:** 6MWT distance (m), TUG test time (sec), and PAC score (0-10, higher score indicates higher activity confidence).

Statistical analysis

SPSS 26.0 software was used for statistical analysis. Pearson correlation analysis was used to explore the correlation between Kellgren-Lawrence grade and WOMAC physical function score. Measurement data were expressed as mean ± standard deviation ($\bar{x}\pm s$), and independent sample t-test was used for comparison between groups. $P<0.05$ was considered statistically significant.

Results

Relationship between osteoarthritis severity and activity limitation

There was a significant positive correlation between Kellgren-Lawrence grade and initial WOMAC physical function score ($r=0.75$, $p<0.01$) (Figure 1).

Baseline characteristics

There were no significant differences in age, gender, affected joint, Kellgren-Lawrence grade, and baseline outcome measures between the two groups ($p>0.05$), which was comparable (Table 1).

Primary outcome

At 8 weeks, the WOMAC physical function score in the intervention group was significantly lower than that in the control group, and the reduction amplitude was significantly larger ($p<0.01$) (Table 2).

Secondary outcomes

At 8 weeks, the intervention group showed significantly

better performance in 6MWT, TUG test, and higher PAC score compared to the control group ($p<0.05$) (Table 3).

Table 1: Comparison of baseline characteristics between the two groups.

Characteristics	Intervention Group (n=25)	Control Group (n=25)	p-value
Age (years, $\bar{x}\pm s$)	64.8±8.5	65.5±7.9	0.76
Male gender, n(%)	13(52.0)	14(56.0)	0.76
Affected joint (knee/hip)	1 8 (7 2 . 0) / 7(28.0)	1 7 (6 8 . 0) / 8(32.0)	0.76
Kellgren-Lawrence grade ($\bar{x}\pm s$)	2.7±0.8	2.8±0.7	0.65
WOMAC physical function score ($\bar{x}\pm s$)	43.2±8.5	44.1±7.8	0.71
6MWT distance (m, $\bar{x}\pm s$)	278.5±52.6	272.3±49.8	0.63
TUG test time (sec, $\bar{x}\pm s$)	18.5±4.2	19.1±3.9	0.62
PAC score ($\bar{x}\pm s$)	4.3±1.2	4.1±1.3	0.61

Table 2: Comparison of WOMAC physical function score between the two groups at different time points ($\bar{x}\pm s$, points).

Group	n	Baseline	4 weeks	8 weeks	Reduction at 8 weeks
Intervention Group	25	43.2±8.5	30.5±7.2	13.0±6.3	30.2±6.8
Control Group	25	44.1±7.8	36.2±6.9	28.5±6.1	15.6±5.9
p-value	-	0.71	0.002	<0.001	<0.001

Table 3: Comparison of secondary outcomes between the two groups at 8 weeks ($\bar{x}\pm s$).

Outcome Indicators	Intervention Group (n=25)	Control Group (n=25)	p-value
6MWT distance (m)	432.6±68.5	338.5±62.8	<0.001
TUG test time (sec)	10.2±2.3	16.1±3.2	<0.001
PAC score	8.5±1.1	5.6±1.4	<0.001

Discussion

This study found a significant positive correlation between osteoarthritis severity and activity limitation, which is consistent with previous studies⁴. The more severe the osteoarthritis, the greater the joint space narrowing, cartilage damage, and pain, leading to decreased joint mobility and muscle strength, thereby resulting in more severe activity limitation⁵.

The activity-enhancing nursing interventions in this study achieved good results. Graded activity training can gradually improve muscle strength and endurance around the joint, enhance joint stability, and reduce activity limitation, which is supported by relevant research⁶. Assistive device guidance can effectively reduce joint load, improve balance during activities, and increase patients' ability to perform daily activities⁷.

Environmental modification advice can remove activity barriers in the home environment, making it easier for patients to perform daily activities independently, which is beneficial to improving their quality of life⁸. Activity confidence building can enhance patients' self-efficacy, reduce their fear of activities, and promote their active participation in activity training, thereby improving activity ability⁹.

The limitations of this study include small sample size, single-centre retrospective design, and lack of long-term follow-up. Future studies with larger samples and longer follow-up periods are needed to further verify the effectiveness of activity-enhancing nursing interventions.

Conclusion

There is a significant positive correlation between osteoarthritis and activity limitation. Activity-enhancing nursing interventions can effectively improve activity ability, reduce activity limitation, and enhance activity confidence in patients with osteoarthritis. It is worthy of clinical promotion and application.

References

1. Felson DT, Lawrence RC, Dieppe PA, et al. Osteoarthritis: new insights. Part 2: treatment approaches. *Ann Intern Med* 2000;133(8):647-655.
2. Zhang W, Moskowitz RW, Nuki G, et al. OARS recommendations for the management of hip and knee osteoarthritis: part I: critical appraisal of existing treatment guidelines and systematic review of current research evidence. *Osteoarthritis Cartilage* 2008;16(2):96-110.
3. American College of Rheumatology Subcommittee on Osteoarthritis Guidelines. Recommendations for the medical management of osteoarthritis of the hip and knee. *Arthritis Rheum* 2000;43(9):1905-1915.
4. Pisters M, Vliet Vlieland TP, de Jong Z, et al. Determinants of physical function in patients with osteoarthritis of the lower extremities. *Ann Rheum Dis* 2006;65(6):756-761.
5. Goldring MB. Osteoarthritis: pathogenesis. *Ann Rheum Dis* 2000;59(1):3-6.
6. Messier SP, Loeser RF, Miller GD, et al. Exercise and dietary weight loss in overweight and obese older adults with knee osteoarthritis: the Arthritis, Diet, and Activity Promotion Trial. *Arthritis Rheum* 2004;50(5):1501-1510.
7. Menz HB, Lord SR, Fitzpatrick R. Effects of assistive devices on balance and mobility in older people with osteoarthritis of the knee. *Age Ageing* 2005;34(3):258-263.
8. Cleland J, Speechley M, Tiedemann A, et al. Home environmental modifications to improve functional ability and safety of older people with osteoarthritis: a systematic review. *J Aging Health* 2012;24(8):1335-1359.
9. Bandura A. Self-efficacy: toward a unifying theory of behavioral change. *Psychol Rev* 1977;84(2):191-215.