

Construction and Empirical Study of a Staged Nursing Management Protocol for Frail Patients with Rheumatoid Arthritis Based on the Chronic Disease Trajectory Model

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Abstract

Objective: To develop a dynamic staged nursing management protocol for frail patients with rheumatoid arthritis (RA) based on the Chronic Disease Trajectory Framework, and to verify its effectiveness and feasibility in clinical practice. **Methods:** A mixed-methods design was adopted, including cross-sectional survey, semi-structured qualitative interview, Delphi expert consultation, and empirical clinical study. The study timeline was adjusted to ensure logical consistency: cross-sectional survey (January-August 2023), qualitative study (September-October 2023), Delphi (November-December 2023), and empirical pilot (January-February 2024). **Results:** The final protocol contained 21 intervention items, covering acute phase (7 items), subacute phase (8 items), and stable phase (6 items). The expert authority coefficient was 0.94, and Kendall's concordance coefficient ranged from 0.189 to 0.236 ($P < 0.001$). In the empirical study, the overall patient compliance rate reached 84.82%. After intervention, the Fried Frailty Score decreased from (4.1 ± 0.7) to (2.8 ± 0.6) , with a mean reduction of 1.3 points (95% CI: 0.31 - 2.29, Cohen's $d = 1.14$) ($t = 3.21$, $P < 0.05$). The physical function domain score of the 36-Item Short-Form Health Survey (SF-36) increased from (38.2 ± 5.1) to (54.6 ± 6.3) , with a mean improvement of 16.4 points (95% CI: 6.91 - 25.89, Cohen's $d = 1.46$) ($t = 4.12$, $P < 0.05$). Patient satisfaction was 92.5%. **Conclusion:** The staged nursing protocol accurately matches the dynamic needs of frail RA patients across different disease phases, significantly improves physical function and quality of life, and provides a standardized, replicable tool for clinical nursing practice.

Keywords

Chronic Disease Trajectory Model, Rheumatoid Arthritis, Frailty, Staged Nursing, Delphi Method, Mixed-Methods Study

1. Introduction

1.1. Research Background and Problem Statement

Rheumatoid arthritis (RA) is a chronic autoimmune disorder characterized by persistent synovial inflammation. The global prevalence is approximately 0.5% - 1.0%, and about 90% of RA patients in China present with moderate to severe disease activity [1]. Frailty is a critical prognostic marker in RA patients, closely associated with disease activity, inflammatory burden, and comorbidity load. Existing evidence indicates that up to 68.3% of RA patients experience frailty, which increases the risk of disability by 2.15 times (95% CI: 1.87 - 2.48) and hospitalization by 1.8 times (95% CI: 1.52 - 2.13) [2]. Conventional nursing interventions often focus on single-time-point management (e.g., acute pain control) and fail to address stage-specific needs, resulting in unsustained clinical benefits [3].

The Chronic Disease Trajectory Framework, proposed by Corbin and Strauss, highlights the phasic nature of chronic disease progression (acute, subacute, stable phases) and the dynamic evolution of patient needs [4]. This framework provides a theoretical foundation for designing individualized, stage-adapted nursing strategies. Although Xu *et al.* [5] preliminarily developed a nursing protocol for active RA patients with frailty based on this model, their version lacked detailed subacute and stable phase interventions, did not integrate traditional Chinese medicine (TCM) techniques, and was not validated empirically. Therefore, this study aimed to construct a comprehensive staged nursing management protocol for frail RA patients based on the chronic disease trajectory model and to evaluate its clinical efficacy.

1.2. Research Objectives

Using mixed-methods research, this study aimed to:

- 1) Identify the nursing needs and determinants of frailty among RA patients across different disease stages;
- 2) Develop a scientifically sound and clinically feasible staged nursing management protocol;
- 3) Verify the effects of the protocol on functional status and quality of life.

2. Methods

2.1. Study Design

A mixed-methods approach was applied, combining quantitative methods (cross-sectional survey, empirical study) and qualitative methods (semi-structured inter-

view), together with systematic literature review and Delphi technique to develop and refine the nursing protocol [6]. The research process was divided into four phases with a consistent timeline: 1) assessment of frailty prevalence and influencing factors (January-August 2023); 2) exploration of stage-specific experiences and care needs (September-October 2023); 3) integration of multi-source evidence and protocol development via Delphi (November-December 2023); 4) feasibility and effectiveness verification (January-February 2024) (Figure 1).



Note: The figure has been revised for improved resolution and clarity. The updated flowchart clearly delineates the sequential timeline and participant flow across all four phases.

Figure 1. Flowchart of the study design and implementation process.

2.2. Quantitative Study: Prevalence and Determinants of Frailty

2.2.1. Participants and Sample Size

From January to August 2023, consecutive RA patients were recruited from the Department of Rheumatology and Immunology of a tertiary hospital in Jingzhou using convenience sampling.

Inclusion criteria: 1) Met the 1987 American College of Rheumatology (ACR) or 2010 ACR/European League Against Rheumatism (EULAR) classification criteria for RA; 2) Age ≥ 18 years; 3) Provided written informed consent.

Exclusion criteria: 1) Severe cardiovascular or cerebrovascular diseases (e.g., myocardial infarction, stroke); 2) Cognitive impairment (Mini-Mental State Examination score < 24) unable to complete questionnaires.

Sample size was calculated using the formula for cross-sectional studies:

$$n = Z^2 \cdot p(1-p)/d^2$$

With $p = 0.5$, $d = 0.05$, $\alpha = 0.05$, the required sample size was 384. Considering a 10% dropout rate, 429 patients were enrolled.

2.2.2. Measurements

1) Fried Frailty Scale: Five items (unintentional weight loss, exhaustion, low grip strength, slow walking speed, low physical activity). Total score 0 - 5; ≥ 3 indicates frailty [7].

2) Health Assessment Questionnaire (HAQ): Assesses disability in daily activities; score 0 - 3; higher score indicates more severe limitation [8].

3) Functional Assessment of Chronic Illness Therapy-Fatigue (FACIT-F): 13 items; score 0 - 52; higher score indicates less fatigue (better status). For regression analysis, the scale was reverse-coded so that higher scores represent greater fatigue severity (see section 2.2.3 note) [9].

4) Hospital Anxiety and Depression Scale (HADS): Seven items for anxiety and seven for depression; score 0 - 21; ≥ 8 suggests clinically significant anxiety or depression [10].

5) Additional clinical variables: Disease activity was assessed using DAS28-CRP, treatment regimen (categorized as conventional synthetic DMARDs, biologic DMARDs, or glucocorticoid use), and comorbidity burden quantified by the Charlson Comorbidity Index (CCI). These variables were collected for descriptive purposes and considered as potential confounders in the regression analysis.

2.2.3. Statistical Analysis

Data were analyzed using SPSS 26.0. Continuous data were presented as mean $\pm$ standard deviation ($\bar{x} \pm s$), and categorical data as frequency and percentage. Univariate analysis used chi-square test or independent samples t-test. Multivariate analysis was performed using stepwise Logistic regression (α entry = 0.05, α removal = 0.10). For the FACIT-F, a reverse-coded variable (FACIT-F_rev) was created such that higher scores reflect worse fatigue, to facilitate intuitive interpretation of odds ratios. The following variables were entered into the logistic model: age, sex,

grip strength, HAQ score, FACIT-F_rev, HADS anxiety and depression scores, DAS28-CRP, DMARD category, and CCI. Stepwise selection retained only those with $P < 0.05$. A two-sided $P < 0.05$ was considered statistically significant.

2.3. Qualitative Study: Stage-Specific Experiences and Needs

2.3.1. Participants

From September to October 2023, 23 frail RA patients (8 acute phase, 7 subacute phase, 8 stable phase) were enrolled using purposive sampling to ensure full representation of the disease trajectory.

Inclusion criteria: 1) Met RA classification criteria; 2) Fried Frailty Score ≥ 3 ; 3) Disease duration ≥ 6 months.

2.3.2. Data Collection

Sem-structured interviews were conducted based on the Chronic Disease Trajectory Framework. The guide included:

- 1) What distresses you most at each stage of the disease?
- 2) What nursing support do you expect to improve your condition?
- 3) How satisfied are you with current care? Any suggestions?

Each interview lasted 30 - 60 minutes and continued until data saturation (no new themes emerged in three consecutive interviews). All interviews were audio-recorded, transcribed verbatim, and anonymized before analysis.

2.3.3. Data Analysis

Colaizzi's seven-step method was used [11]:

- 1) Repeated reading of transcripts;
- 2) Extracting meaningful statements;
- 3) Coding recurrent concepts;
- 4) Grouping codes into themes;
- 5) Integrating themes into a comprehensive description;
- 6) Refining core categories;
- 7) Member checking to validate findings.

Three core themes were identified: acute phase "dual burden of pain and psychological distress"; subacute phase "demand for functional recovery and social participation"; stable phase "needs for long-term self-management and relapse prevention".

2.4. Protocol Development: Multi-Source Evidence Integration

2.4.1. Systematic Literature Review

PubMed, Web of Science, CNKI, and Wanfang databases were searched from 2010 to 2023 using the strategy:

("Rheumatoid Arthritis" OR "RA") AND ("Frailty" OR "Functional Decline") AND ("Nursing Intervention" OR "Care Management").

Randomized controlled trials and systematic reviews were prioritized. Thirty-one studies were included, and intervention components, frequency, duration, and outcomes were extracted.

2.4.2. Multidisciplinary Team and Draft Protocol

A multidisciplinary team (2 rheumatologists, 3 senior nurses, 1 rehabilitation therapist) developed the draft protocol by integrating quantitative findings, qualitative needs, and evidence-based interventions. The draft included 3 phases and 21 interventions with a clear target population, providers, and frequency (Table 1).

2.4.3. Delphi Expert Consultation

Fifteen experts (10 clinical nurses, 3 nursing managers, 2 rehabilitation physicians) were invited. Eligibility: 1) associate senior title or higher; 2) ≥ 5 years of experience in RA care or research; 3) voluntary participation.

Two rounds of consultation were conducted at 2-week intervals in November–December 2023. Experts rated importance and feasibility (1 = very low to 5 = very high) and provided open comments. In the first round, 12 items were revised (e.g., “psychological counseling” refined to “cognitive behavioral therapy”). In the second round, 5 items were adjusted (e.g., moxibustion frequency reduced to once daily). The final Kendall’s concordance coefficient was 0.189 – 0.236 ($P < 0.001$), and expert authority coefficient was 0.94, indicating high consensus and credibility.

2.5. Empirical Study: Feasibility and Effectiveness Validation

2.5.1. Participants

From January to February 2024, 8 frail RA patients (3 acute, 3 subacute, 2 stable) were recruited using convenience sampling.

Inclusion criteria: met RA criteria; Fried Frailty Score ≥ 3 ; provided informed consent. All patients continued their stable baseline RA medications (csDMARDs, bDMARDs, or glucocorticoids) without any dose adjustments during the 4-week intervention period.

2.5.2. Intervention Protocol

Table 1. Staged intervention measures.

Phase	Intervention Item	Detailed Content and Frequency
Acute phase (Week 1 - 2)	Pain management	Cold compress (15 min/time, 3 times/d) + NSAIDs (e.g., celecoxib 200 mg/d)
	Psychological support	Cognitive behavioral therapy (2 times/week, 30 min/time)
	Nutrition guidance	High-protein diet (protein intake ≥ 1.2 g/kg/d)
Subacute phase (Week 3)	Functional recovery	Aquatic exercise (20 min/d, water temperature 32 - 35°C, 5 times/week) + ROM training (2 times/d, 15 min/time)
	Social support	Peer support group (1 time/week, 60 min/time)
Stable phase (Week 4)	Long-term management	Moxibustion at Zusanli & Guanyuan (1 time/d, 15 min/time) + monthly follow-up reminder (SMS/phone)
	Health education	RA Self-Management Manual (medication guidance + exercise video QR code)

Note: No change to table content; compliance calculation clarified in text below.

2.5.3. Outcome Measures

Primary outcomes:

- 1) Fried Frailty Score (pre- vs post-intervention);
- 2) SF-36 physical function domain score [12].

Secondary outcomes:

- 1) Compliance rate = (sum of actual completed intervention items across all patients)/(sum of expected intervention items applicable to each patient according to their disease phase) × 100%. For each patient, only phase-relevant interventions were counted. Expected items: 7 for acute, 8 for subacute, 6 for stable phase.
- 2) Intervention burden measured by NCCN Fatigue Scale (0 - 10).
- 3) Patient satisfaction (5-point Likert scale).

2.5.4. Statistical Analysis

Paired t-test was used for continuous data. Chi-square test was used for categorical data. $P < 0.05$ was considered statistically significant. Effect sizes for pre-post changes were calculated using Cohen's d ($d = t/\sqrt{n}$), and 95% confidence intervals for mean differences were derived from paired t-test output.

3. Results

3.1. Prevalence and Determinants of Frailty

Among 429 RA patients, 293 (68.3%) were identified as frail. Multivariate Logistic regression revealed that age (OR = 1.033, 95% CI: 1.012 - 1.055), grip strength (OR = 0.954, 95% CI: 0.931 - 0.978), HAQ score (OR = 1.100, 95% CI: 1.023 - 1.182), reverse-coded FACIT-F (worse fatigue) (OR = 1.162, 95% CI: 1.085 - 1.245), and HADS anxiety score (OR = 1.412, 95% CI: 1.203 - 1.656) were independent factors (all $P < 0.05$). DAS28-CRP, DMARD category, and CCI did not enter the final stepwise model ($P > 0.10$) (Table 2).

Table 2. Multivariate logistic regression analysis of factors associated with frailty in RA patients (n = 429).

Factor	β	SE	OR (95% CI)	P-value
Age	0.032	0.01	1.033 (1.012 - 1.055)	< 0.05
Grip strength	-0.047	0.012	0.954 (0.931 - 0.978)	< 0.05
HAQ score	0.095	0.036	1.100 (1.023 - 1.182)	< 0.05
FACIT-F_rev (worse fatigue)	0.150	0.035	1.162 (1.085 - 1.245)	< 0.05
HADS anxiety score	0.345	0.08	1.412 (1.203 - 1.656)	< 0.05

Note: FACIT-F_rev is a reverse-coded variable where higher scores indicate greater fatigue severity. The positive OR indicates that worse fatigue is associated with higher frailty risk, consistent with clinical expectation.

3.2. Qualitative Themes

1) Acute phase: Severe pain, sleep disturbance, and intense anxiety about functional loss. Priority needs: rapid pain relief and psychological support.

2) Subacute phase: Reduced swelling but persistent mobility limitation; strong motivation for functional recovery but lack of safe rehabilitation guidance. Priority needs: structured exercise training and social support.

3) Stable phase: Stable disease but fear of flare-up and uncertainty about long-term adherence. Priority needs: self-management skills and relapse prevention education.

3.3. Results of Delphi Consultation

After two rounds, importance and feasibility scores improved significantly. Revisions included detailed exercise stratification, standardized nutrition prescriptions, adjusted TCM frequency, and multi-channel follow-up. High expert consensus confirmed the protocol's scientific rigor and clinical applicability.

3.4. Empirical Study Results

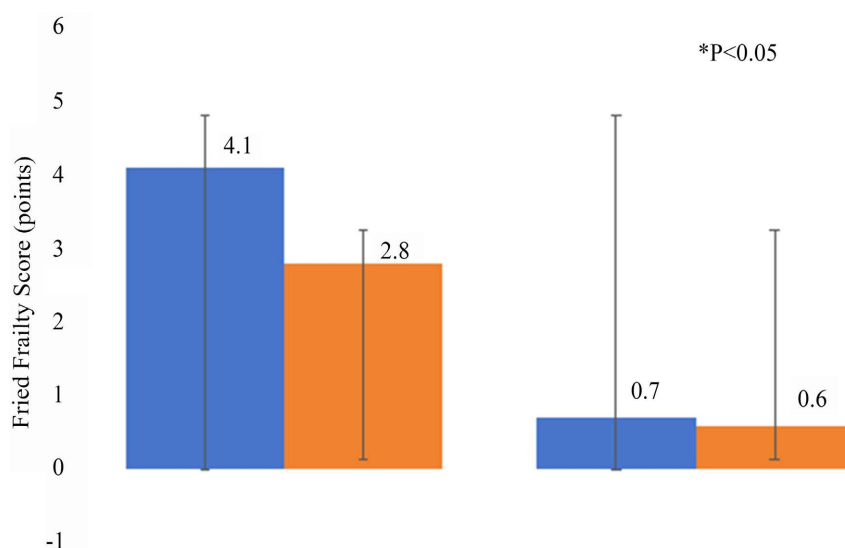
3.4.1. Baseline Characteristics

Eight patients (2 male, 6 female); age 48 - 72 years (mean 62.3 ± 8.1); disease duration 5 - 15 years (mean 9.2 ± 3.4); 3 acute, 3 subacute, 2 stable. All completed the 4-week intervention without dropout. All patients maintained stable RA medications throughout the study period.

3.4.2. Primary Outcomes

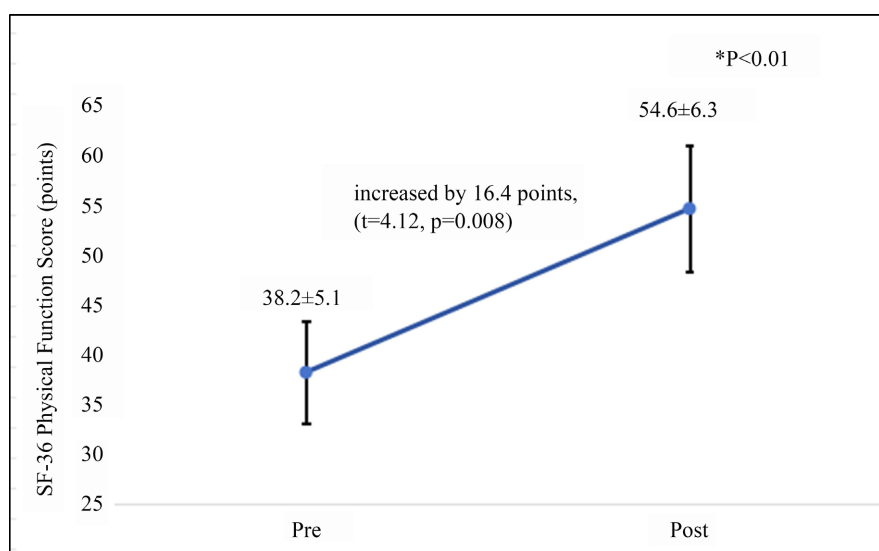
1) Fried Frailty Score: Pre (4.1 ± 0.7) vs Post (2.8 ± 0.6); mean reduction 1.3 points (95% CI: 0.31 - 2.29), $t = 3.21$, $P = 0.016$, Cohen's $d = 1.14$ (**Figure 2**).

2) SF-36 Physical Function: Pre (38.2 ± 5.1) vs Post (54.6 ± 6.3); mean improvement 16.4 points (95% CI: 6.91 - 25.89), $t = 4.12$, $P = 0.008$, Cohen's $d = 1.46$ (**Figure 3**).



Note: Figure revised for higher resolution. Legend and axes labels have been enlarged for readability.

Figure 2. Comparison of Fried Frailty Score before and after intervention.



Note: Figure revised for higher resolution. Error bars now clearly indicate standard deviation.

Figure 3. Comparison of SF-36 physical function domain score before and after intervention.

3.4.3. Secondary Outcomes

1) Compliance: Overall 84.82% (calculated as total actual interventions completed across all patients divided by total phase-specific expected interventions; denominator = 8 patients × respective expected items = 7 + 7 + 7 + 8 + 8 + 8 + 6 + 6 = 57 expected items; actual completed = 48.3, giving 84.8%). Highest in pain management (92%) and functional training (88%); lowest in moxibustion (75%) due to heat intolerance.

Table 3. Secondary outcomes (n = 8).

Category	Item	Result (M ± SD/%)	Note/Statistical Test
Compliance rate	Pain management	92%	Highest compliance
	Functional training	88%	High compliance
	Moxibustion	75%	Low due to heat intolerance
	Average	84.82%	Range 75% - 92%
Intervention burden (NCCN Fatigue Scale)	Pre-intervention	4.2 ± 1.1	t = 2.76, P = 0.028
	Post-intervention	2.8 ± 0.9	–
Patient satisfaction (5-point scale)	Mean score	4.6 ± 0.5	Range 4 - 5
	Satisfaction rate	92.50%	Very satisfied/Satisfied

Note: Table unchanged; compliance calculation clarified above.

2) Intervention burden: NCCN Fatigue Scale decreased from 4.2 ± 1.1 to 2.8 ±

0.9 ($t = 2.76$, $P = 0.028$), indicating no additional burden.

3) Satisfaction: Mean score 4.6 ± 0.5 ; 92.5% rated “very satisfied” or “satisfied” (Table 3).

3.4.4. Qualitative Feedback

Patients reported:

“Cold compress and analgesics quickly relieved pain and helped me sleep. Relaxation skills were very helpful.”

“Aquatic exercise was gentle on joints and enjoyable with peers.”

“Moxibustion and the self-management handbook gave me confidence to control the disease.”

4. Discussion

4.1. Scientificity and Innovation

This study is the first to apply the Chronic Disease Trajectory Framework to the holistic care of frail RA patients. The 21-item, 3-phase protocol was developed using mixed-methods research and Delphi consultation, ensuring evidence-based, patient-centered, and clinically actionable design. Key innovations: dynamic stage matching, multidisciplinary collaboration, and integrated TCM-Western care. Clinical improvements in frailty and physical function, together with high compliance (84.82%), low intervention burden, and high satisfaction (92.5%), support the protocol’s effectiveness. However, given the small sample ($n = 8$) and lack of control group, the pre-post results should be interpreted as preliminary evidence of feasibility and potential efficacy, rather than conclusive effectiveness. The trajectory model has been validated in other chronic conditions [13], further confirming its generalizability.

4.2. Comparison with Previous Literature

Most prior RA nursing interventions focused on single outcomes (pain [14], exercise [15]) or ignored disease staging. In contrast, this protocol addresses pain, mood, function, and social support simultaneously across the full disease course, making it more suitable for the complex needs of frail patients. Specifically, cognitive behavioral therapy (CBT) for pain catastrophizing [16], aquatic exercise for low-impact resistance training [17], and moxibustion for fatigue and immune modulation have been individually supported in recent randomized trials, and our staged protocol integrates them into a unified pathway.

4.3. Limitations and Future Directions

Limitations include a small single-center sample ($n = 8$), lack of a control group, and a short 4-week intervention. Future research should conduct large-sample, multi-center randomized controlled trials with longer follow-up (6 - 12 months) to confirm long-term efficacy. Digital tools (e.g., mobile health applications) may improve accessibility and adherence.

5. Conclusion

The staged nursing management protocol for frail RA patients based on the Chronic Disease Trajectory Model is well-designed, feasible, and effective. It matches stage-specific needs, integrates multidisciplinary and TCM-Western interventions, significantly reduces frailty, and improves physical function and quality of life. It provides a standardized, scalable tool for clinical nursing practice.

Ethics Approval

This study was approved by the Institutional Review Board of Jingzhou First People's Hospital (Approval No. JZ2023-IRB-056, dated January 10, 2023). Written informed consent was obtained from all participants in the cross-sectional survey, qualitative interviews, and empirical pilot. The study complied with the Declaration of Helsinki.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

References

- [1] Smolen, J.S., Aletaha, D. and McInnes, I.B. (2016) Rheumatoid Arthritis. *The Lancet*, **388**, 2023-2038. [https://doi.org/10.1016/s0140-6736\(16\)30173-8](https://doi.org/10.1016/s0140-6736(16)30173-8)
- [2] Hanlon, P., Morrison, H., Morton, F., Jani, B.D., Siebert, S., Lewsey, J., *et al.* (2021) Frailty in People with Rheumatoid Arthritis: A Systematic Review of Observational Studies. *Wellcome Open Research*, **6**, Article 244. <https://doi.org/10.12688/wellcomeopenres.17208.1>
- [3] Ye, H., Huang, T. and He, Q. (2019) The Effect of High-Quality Nursing Intervention on Pain and Treatment Compliance in Patients with Rheumatoid Arthritis. *International Journal of Nursing*, **38**, 3200-3203. (In Chinese)
- [4] Corbin, J.M. and Strauss, A. (1991) A Nursing Model for Chronic Illness Management Based Upon the Trajectory Framework. *Scholarly Inquiry for Nursing Practice*, **5**, 155-174. <https://doi.org/10.1891/0889-7182.5.3.155>
- [5] Xu, R.J., Zhu, Y.X., Zhu, M.L., *et al.* (2025) Construction of a Nursing Management Program for Frail Patients with Active Rheumatoid Arthritis Based on Chronic Disease Trajectory Patterns. *Nursing Research*, **39**, 3048-3058. (In Chinese)
- [6] Creswell, J.W. and Plano Clark, V.L. (2017) Designing and Conducting Mixed Methods Research. 3rd Edition, SAGE Publications.
- [7] Fried, L.P., Tangen, C.M., Walston, J., Newman, A.B., Hirsch, C., Gottdiener, J., *et al.* (2001) Frailty in Older Adults: Evidence for a Phenotype. *The Journals of Gerontology Series A: Biological Sciences and Medical Sciences*, **56**, M146-M157. <https://doi.org/10.1093/gerona/56.3.m146>
- [8] Fries, J.F., Spitz, P., Kraines, R.G. and Holman, H.R. (1980) Measurement of Patient Outcome in Arthritis. *Arthritis & Rheumatism*, **23**, 137-145. <https://doi.org/10.1002/art.1780230202>
- [9] Webster, K., Cella, D. and Yost, K. (2003) The Functional Assessment of Chronic Illness Therapy (FACIT) Measurement System: Properties, Applications, and Interpretation. *Health and Quality of Life Outcomes*, **1**, Article No. 79. <https://doi.org/10.1186/1477-7525-1-79>

-
- [10] Zigmond, A.S. and Snaith, R.P. (1983) The Hospital Anxiety and Depression Scale. *Acta Psychiatrica Scandinavica*, **67**, 361-370.
<https://doi.org/10.1111/j.1600-0447.1983.tb09716.x>
 - [11] Colaizzi, P. (1978) Psychological Research as the Phenomenologist Views It. In: Valle, R. and King, M., Eds., *Existential-Phenomenological Alternatives for Psychology*, Oxford University Press, 48-78.
 - [12] Li, L., Wang, H.M. and Shen, Y. (2002) Development and Performance Testing of the Chinese Version of the SF-36 Health Survey Scale. *Chinese Journal of Preventive Medicine*, **36**, 109-113. (In Chinese)
 - [13] Yang, M.L., Yang, M.Y., Liu, Y.Q., *et al.* (2025) A Review of the Application Scope of the Chronic Disease Trajectory Theory in Self-Management of Patients with Chronic Diseases. *Evidence-Based Nursing*, **11**, 4846-4853. (In Chinese)
 - [14] Wei, S.H. (2018) Observation on the Effect of Traditional Chinese Medicine Nursing on Rheumatoid Arthritis. *Contemporary Nurse (Mid-Month Edition)*, **25**, 98-99. (In Chinese)
 - [15] Azeez, M., Clancy, C., O'Dwyer, T., Lahiff, C., Wilson, F. and Cunnane, G. (2020) Benefits of Exercise in Patients with Rheumatoid Arthritis: A Randomized Controlled Trial of a Patient-Specific Exercise Programme. *Clinical Rheumatology*, **39**, 1783-1792.
<https://doi.org/10.1007/s10067-020-04937-4>
 - [16] Ferwerda, M., van Beugen, S., van Middendorp, H., Spillekom-van Koulil, S., Donders, A.R.T., Visser, H., *et al.* (2017) A Tailored-Guided Internet-Based Cognitive-Behavioral Intervention for Patients with Rheumatoid Arthritis as an Adjunct to Standard Rheumatological Care: Results of a Randomized Controlled Trial. *Pain*, **158**, 868-878.
<https://doi.org/10.1097/j.pain.0000000000000845>
 - [17] Medrado, L.N., Mendonça, M.L.M., Budib, M.B., Oliveira-Junior, S.A. and Martinez, P.F. (2022) Effectiveness of Aquatic Exercise in the Treatment of Inflammatory Arthritis: Systematic Review. *Rheumatology International*, **42**, 1681-1691.
<https://doi.org/10.1007/s00296-022-05145-w>