Shared Decision-Making in Postoperative Rehabilitation after Total Knee Arthroplasty: A Perspective on Enhancing Exercise Adherence

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ABSTRACT

Context: Total knee arthroplasty (TKA) is an effective treatment for end-stage knee diseases. However, poor adherence to postoperative rehabilitation exercise remains common and compromises functional recovery. Shared decision-making (SDM) has emerged as a promising patient-centered approach to improve rehabilitation adherence.

Aim: This conceptual review summarizes the application of SDM in postoperative rehabilitation after TKA and its role in improving exercise adherence.

Methods: Relevant literature on SDM and rehabilitation after TKA was reviewed to summarize influencing factors, intervention strategies, clinical outcomes, and future research directions.

Results: Rehabilitation adherence is affected by postoperative pain, kinesiophobia, self-efficacy, decision conflict, and social support. SDM-based interventions, including decision aids, structured communication, multidisciplinary collaboration, and digital health technologies, can improve patient participation, enhance exercise adherence, and promote functional recovery. However, evidence on long-term effectiveness remains limited.

Conclusion: SDM is a promising strategy for improving rehabilitation exercise adherence after TKA. Future research should establish standardized and culturally appropriate SDM interventions and evaluate their long-term effectiveness.

Keywords: Exercise adherence, shared decision making, total knee arthroplasty

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1. Introduction

Total knee arthroplasty (TKA) has become a mature and standardized surgical procedure for treating end-stage knee joint diseases and improving patients' quality of life. With the acceleration of population aging, the volume of TKA surgeries continues to rise globally *(Price et al., 2018).* However, surgical success merely marks the beginning of functional recovery. High postoperative exercise adherence enables patients to regain joint mobility earlier and more effectively, reduces postoperative complications, and is recognized as a key factor in promoting joint reconstruction and accelerating functional recovery following TKA *(Wright et al., 2014).*

Although rehabilitation guidelines unequivocally emphasize the importance of early postoperative exercise, patients' functional exercise adherence remains generally unsatisfactory in clinical practice. Studies indicate that overall postoperative exercise adherence is suboptimal, with many patients unable to consistently follow prescribed rehabilitation training plans, thereby severely compromising functional recovery *(Rucinski et al., 2023).* Persistently low adherence can lead to muscle atrophy, joint stiffness, and other complications that seriously affect postoperative rehabilitation progress and daily quality of life. This poor adherence not only directly undermines the long-term efficacy of surgery but also results in the waste of healthcare resources and diminished patient satisfaction *(Morrell et al., 2021).*

Traditional nursing intervention models are predominantly grounded in the biomedical paradigm *(Cleary, 1999),* emphasizing unidirectional clinician instruction (i.e., prescriptive education) while often

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overlooking patients' intrinsic needs and personal values as active participants in their treatment. This approach leaves patients lacking autonomy and engagement during the rehabilitation process *(Bassi et al., 2026; Pang et al., 2025).* In recent years, shared decision making (SDM) has garnered increasing scholarly attention as a novel clinical decision-making paradigm that integrates evidence-based medicine with patient-centered care *(Charles et al., 1997).* SDM emphasizes information exchange, value clarification, and collaborative deliberation between clinicians and patients to arrive at medical decisions that best align with patient preferences *(Stiggelbout et al., 2015).*

Introducing SDM theory into the rehabilitation management of TKA patients—through the development of standardized decision aid tools that enable patients to participate deeply in setting rehabilitation goals and selecting exercise regimens—can enhance patients' rehabilitation motivation at its source, thereby improving functional exercise adherence *(Riddle et al., 2021).* Currently, research on SDM in orthopedic nursing remains in its early stages, and systematic intervention protocols targeting exercise adherence among TKA patients are scarce *(Riddle et al., 2021; van der Sluis et al., 2021).* Accordingly, this review aims to synthesize the core concepts of SDM, the factors influencing adherence among TKA patients, and the progress of SDM-based intervention research, to provide an evidence-based foundation for clinical nursing staff to develop scientifically sound and feasible intervention protocols.

2. Factors Influencing Functional Exercise Adherence in TKA Patients

Functional exercise adherence among TKA patients is shaped by the interplay of physiological, psychological, and social-environmental factors, exhibiting a complex and dynamic trajectory. At the physiological level, severe postoperative pain constitutes a major objective barrier to implementing rehabilitation plans *(Lavand'Homme et al., 2022; Li et al., 2024),* and age-related muscle strength decline or chronic comorbidities further limit patients' physical activity tolerance among older adults. At the psychological level, kinesiophobia—anchored in the fear-avoidance model—is widely prevalent *(Yan et al., 2023),* manifesting primarily as avoidance of physical activity due to fear of exercise-induced pain or re-injury.

Concomitantly, low self-efficacy serves as an exacerbating factor for kinesiophobia *(Cai et al., 2018; Xu et al., 2024),* contributing to declining exercise adherence *(Zhou et al., 2023).* From the perspective of decision-making and cognition, profound information asymmetry between clinicians and patients generates significant decisional conflict *(Ghomrawi et al., 2025).* When clinical rehabilitation pathways are misaligned with patients' personal values, economic constraints, or family caregiving capacity, patients lacking a sense of participation often exhibit diminished exercise adherence *(de Jesus et al., 2017).*

Furthermore, the strength of the social support system is another critical variable *(Serikova-Esengeldina et al., 2022).* Insufficient family support and limited access to home- and community-based rehabilitation resources create numerous difficulties for patients in sustaining rehabilitation exercises after discharge, thereby compromising the continuity and adherence to rehabilitation training *(Joshi et al., 2021; Liu et al., 2026).* In summary, the adherence problem among TKA patients is not merely a matter of knowledge deficit but rather the result of multiple interacting barriers, underscoring the necessity of introducing intervention models capable of balancing clinician-patient preferences and reducing decisional conflict.

3. SDM-Based Intervention Strategies for Functional Exercise in TKA Patients

In response to suboptimal rehabilitation adherence among TKA patients, SDM-based intervention strategies have evolved from standalone health education to systematic decision support. First, the development and application of decision aids (DAs) constitute the cornerstone of such interventions. Researchers have developed paper-based guides *(Karunaratne et al., 2025),* interactive multimedia videos *(Lützner et al., 2024)* and mobile health (mHealth) applications *(Girotra et al., 2025)*, to present patients with evidence-based information on the potential benefits, risks, and expected outcomes of different exercise regimens (e.g., home-based versus facility-based rehabilitation, active versus passive training), thereby effectively alleviating decision anxiety arising from information asymmetry *(Stacey et al., 2014).*

Second, standardized clinician-patient communication protocols represent the core mechanism for implementing SDM. Clinical practice commonly adopts the three-talk model of shared decision making *(Elwyn et al., 2017),* which proceeds through team talk to establish collaborative relationships, option talk to clarify patient preferences and values, and decision talk to reach consensus, thereby transforming patients from passive recipients of instructions into co-creators of their rehabilitation plans.

Moreover, dynamic decision support within a multidisciplinary team (MDT) framework further optimizes intervention outcomes. An interdisciplinary team comprising orthopedic surgeons, rehabilitation therapists, and specialist nurses dynamically adjusts and jointly refines exercise plans according to patients' pain levels and joint range of motion at different postoperative stages, ensuring that decisions are both scientifically grounded and individualized *(Jette et al., 2020; Nguyen et al., 2022; Zhou & Wei, 2024).*

This patient-value-oriented intervention model not only reduces patients' decisional conflict but also fundamentally enhances the intrinsic motivation for functional exercise and long-term adherence by strengthening their sense of rehabilitation autonomy.

4. Evaluation of SDM Effectiveness and Current Limitations

A substantial body of clinical research has demonstrated that integrating SDM into TKA rehabilitation management yields significant clinical benefits. In terms of clinical outcomes, SDM has been shown to markedly improve patients' functional exercise adherence, as evidenced by gains in joint range of motion (ROM) and reductions in postoperative complication rates *(Chrenka et al., 2022;*

Gimm et al., 2025). In the domains of psychological well-being and decision quality, value clarification and information sharing have substantially reduced patients' decisional conflict and enhanced their identification with the rehabilitation plan and their sense of self-efficacy, thereby improving the healthcare experience and quality of life *(Chrenka et al., 2022; Faiman & Tariman, 2019).*

However, there are still certain limitations regarding the clinical application of SDM in populations. First, SDM interventions have predominantly focused on preoperative surgical decision-making, with systematic, full-process decision support protocols for long-term postoperative functional exercise remaining underdeveloped. Second, outcome measures have largely concentrated on short-term clinical endpoints, lacking sustained tracking of long-term behavioral change and the quality of social reintegration. Third, the development of intervention tools has generally not adequately accounted for patients' cultural backgrounds and digital literacy, thereby limiting the clinical generalizability of these tools *(Churchill et al., 2025; Nowell et al., 2020; Wang et al., 2026).*

5. Summary and Future Directions

In summary, shared decision making offers a novel perspective and pathway for enhanced functional exercise adherence among TKA patients. Future research should prioritize the following directions. First, culturally adapted decision support pathways should be developed that take into account the clinician-dominant healthcare culture and psychological characteristics of the target population, thereby producing more precisely targeted intervention tools. Second, intelligent healthcare technologies, including big data analytics and artificial intelligence—should be leveraged to enable dynamic updating and personalized delivery of rehabilitation decisions. Third, high-quality, large-sample randomized controlled trials should be conducted to further validate the long-term effects of SDM intervention protocols across diverse patient subgroups. Developing and implementing a scientifically rigorous, systematic SDM-based intervention framework adapted to local contexts holds substantial practical value for improving rehabilitation outcomes in TKA patients and optimizing the allocation of healthcare resources.

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