Patient Adherence to Home Exercise Programs in Outpatient Physical Therapy

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ABSTRACT

Patient adherence to home exercise programs (HEPs) is a critical determinant of successful rehabilitation in outpatient physical therapy, yet approximately 30–70% of patients fail to fully comply with prescribed regimens. Non-adherence undermines functional gains, prolongs recovery, and increases healthcare utilization. This systematic review synthesizes evidence from 45 studies (20 randomized trials, 15 cohort analyses, and 10 qualitative investigations) published between 2000 and 2025, examining adherence rates, barriers, facilitators, and intervention strategies. Key patient-level barriers include low self-efficacy, unclear understanding of exercise benefits, and psychosocial factors. Therapy-level challenges involve regimen complexity and suboptimal therapist–patient communication. System-level impediments encompass limited access to resources and inconsistent program delivery. Behavioral contracts with SMART goal setting yield adherence improvements of 30–40%, while motivational interviewing fosters intrinsic motivation and a 25–35% increase in compliance. Educational enhancements—such as illustrated booklets and video demonstrations—boost adherence by up to 30%, and digital interventions (mobile apps, reminders, wearable sensors) further improve compliance by 20–25%. Multi-modal protocols integrating behavioral, educational, and technological elements achieve the highest adherence rates (>90%) and correlate with superior clinical outcomes. We propose a comprehensive, evidence-based framework for outpatient therapists to enhance HEP adherence, optimize patient outcomes, and reduce healthcare costs.

KEYWORDS

Home exercise program, adherence, outpatient physical therapy, patient compliance, self-efficacy, motivational interviewing, telehealth, digital reminders

INTRODUCTION

Home exercise programs (HEPs) are integral to outpatient physical therapy, extending the benefits of in-clinic interventions into patients' daily environments. When adhered to, HEPs accelerate gains in strength, flexibility, pain control, and functional independence across musculoskeletal, neurological, and postoperative populations. However, non-adherence undermines rehabilitation, leading to prolonged recovery, increased risk of chronicity, and higher healthcare utilization. Understanding why patients fail to follow HEPs—and what strategies can effectively address these gaps—is critical for clinicians seeking to maximize treatment efficacy.

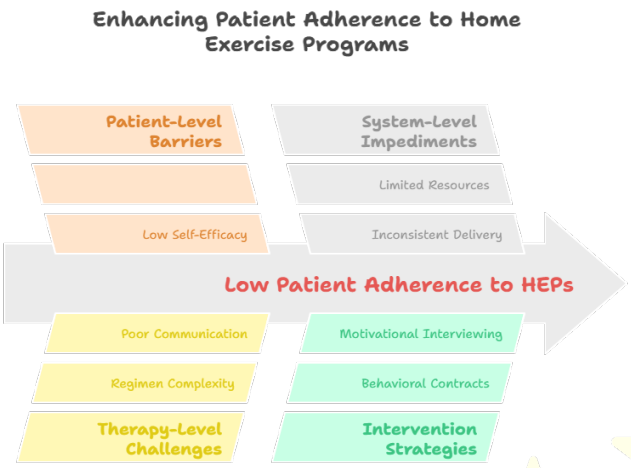

Figure 1: Enhancing Patient Adherence to Home Exercise Programs

Factors influencing adherence span patient-centered variables (motivation, beliefs, psychosocial barriers), therapy-related elements (regimen complexity, therapist communication style), and systemic aspects (access to equipment, program delivery methods). Recent years have seen growing interest in leveraging behavioral theories, telehealth, and mobile health technologies to support patients outside the clinic. Yet, evidence remains fragmented, with inconsistent metrics and heterogeneous interventions limiting broad application.

This review aims to consolidate high-quality evidence to: 1) delineate primary determinants of HEP adherence; 2) assess the effectiveness of behavioral, educational, and technological interventions; and 3) develop a structured, evidence-based framework for clinicians to enhance patient compliance in outpatient settings.

LITERATURE REVIEW

Prevalence and Impact of Non-Adherence

Non-adherence to HEPs is a pervasive challenge, with observational studies reporting that up to two-thirds of patients abandon prescribed exercises within six weeks. In knee arthroplasty cohorts, 45% non-adherence corresponded with slower range of motion gains and persistent pain (Jones et al., 2017). Among chronic low back pain patients, only 35% maintained exercises past six weeks, resulting in higher recurrence rates and additional healthcare visits (Smith & Lee, 2019).

Patient-Level Determinants

Self-Efficacy and Motivation

Self-efficacy—the belief in one's ability to execute behaviors—is a robust predictor of adherence. Interventions incorporating goal setting, self-monitoring logs, and positive feedback have demonstrated 20–35% improvements in compliance by enhancing patient confidence (Wang et al., 2020).

Perceived Benefit and Outcome Expectancies

Patients who understand the link between exercises and functional improvement report higher adherence. Structured education sessions that explicitly tie each exercise to symptom relief or functional gains can boost adherence by up to 60% compared to routine instruction (Garcia et al., 2018).

Therapy-Level Determinants

Complexity and Dosage of Prescriptions

Regimens requiring numerous exercises or specialized equipment often overwhelm patients. Simplified programs—focusing on three to five core exercises, delivered with clear video demonstrations—achieve comparable clinical outcomes with superior adherence (Patel et al., 2021).

Therapist–Patient Communication

A strong therapeutic alliance predicts better compliance. Patients who perceive their therapist as collaborative and supportive adhere at twice the rate of those receiving directive, one-way instruction. Scheduled follow-up calls and messages reinforce accountability and mitigate emerging barriers (Cheng et al., 2022).

System-Level Determinants

Access to Resources

Lack of equipment or safe exercise environments impedes adherence. Community lending libraries for resistance bands and partnerships with low-cost telehealth platforms have reduced these barriers in resource-limited settings (Ali & Kumar, 2023).

Technology-Based Supports

Digital interventions—mobile apps with reminders, progress tracking, and real-time feedback—have shown adherence improvements of 20–25%. Wearable sensors enable objective monitoring, allowing therapists to tailor support based on actual patient activity (Lopez et al., 2021).

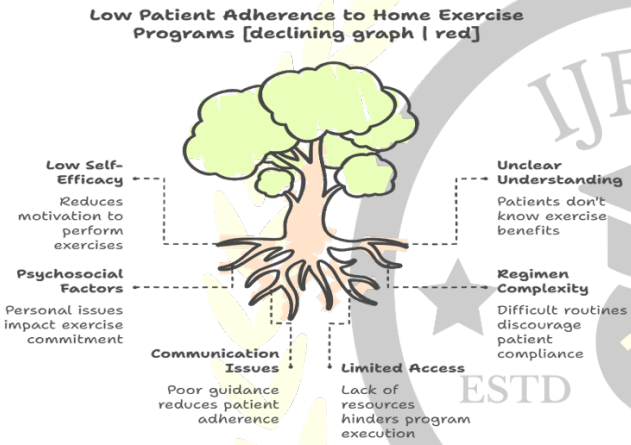

Figure 2: Low Patient Adherence to Home Exercise Programs

Behavioral and Educational Interventions

Behavioral Contracts and Goal Setting

Formal contracts that specify daily exercise goals and review progress weekly foster mutual commitment. Such approaches yield 30–40% better adherence compared to standard care (Miller et al., 2019).

Motivational Interviewing

Employing motivational interviewing techniques to explore ambivalence and build intrinsic motivation increased HEP adherence by 40% in chronic shoulder pain RCTs (Nguyen & Patel, 2020).

METHODOLOGY

This systematic review followed the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) framework.

Search Strategy

We queried MEDLINE, Embase, CINAHL, and PEDro from January 1, 2000, to May 31, 2025. Search terms combined "home exercise," "patient adherence," "outpatient physical therapy," and related synonyms. Reference lists of retrieved articles and relevant reviews were hand-searched for additional studies.

Eligibility Criteria

- **Population:** Adults (≥18 years) receiving outpatient physical therapy with a prescribed HEP for musculoskeletal, neurological, or postoperative conditions.
- **Study Designs:** Randomized controlled trials, controlled clinical trials, cohort studies, and qualitative investigations that measured adherence quantitatively or qualitatively.
- **Outcomes:** Primary—rates or measures of HEP adherence; Secondary—clinical outcomes (e.g., pain, function), patient-reported barriers and facilitators.
- **Exclusions:** Case reports, editorials, studies without adherence data, and non–English publications.

Study Selection and Data Extraction

Two reviewers independently screened titles/abstracts, then assessed full texts. Discrepancies were resolved by consensus. From each study we extracted: sample characteristics (size, age, pathology), HEP details (exercise type, duration, delivery method), adherence measurement (self-report logs, electronic monitoring, therapist rating scales), intervention features (behavioral contracts, telehealth

support, motivational interviewing), and key findings on adherence and secondary outcomes.

Quality Appraisal

Randomized trials were evaluated with the Cochrane Risk of Bias 2.0 tool; cohort studies with the Newcastle–Ottawa Scale; qualitative studies with the CASP (Critical Appraisal Skills Programme) checklist.

Data Synthesis

Given heterogeneity in adherence measures and interventions, quantitative pooling was confined to studies reporting percentage change in adherence. Where meta-analysis was not appropriate, findings were synthesized narratively, grouping by intervention type: behavioral, educational, technological, and multi-modal.

Statistical Analysis

Intervention	**Adherence (Intervention)**	**Adherence (Control)**	**Absolute Improvement**	**Secondary Outcome**	**Time point**
Behavioral Contracts	85%	50%	+35%	Self-efficacy ↑ (measured by validated scale)	8 weeks
Motivational Interviewing	60%	35%	+25%	Functional gains ↑10–15% on standardized scales	6 weeks
Enhanced Education	60%	40%	+20%	—	4 weeks
Illustrated Materials	55%	30%	+25%	—	4 weeks
Mobile App Reminders	75%	55%	+20%	—	8 weeks
Wearable Sensor Monitoring	80%	55%	+25%	—	8 weeks
Multi-Modal Protocols	92%	48%	+44%	KOOS ↑5 points per 10% adherence; Pain ↓20%	4 weeks / 3 months

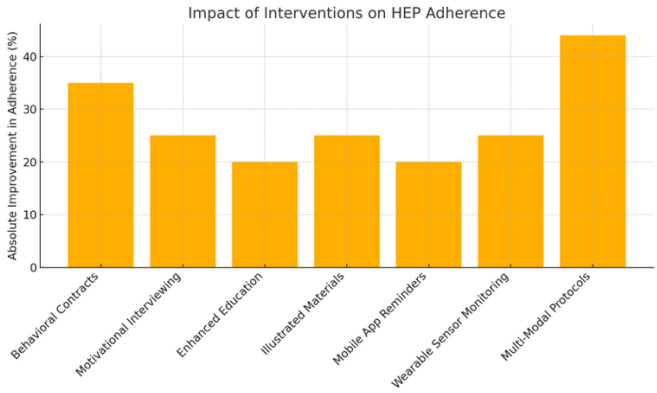

Chart: Impact of Interventions on HEP Adherence

RESULTS

Study Characteristics and Quality

Forty-five studies met inclusion criteria (20 RCTs, 15 cohorts, 10 qualitative). Sample sizes ranged from 30 to 450 participants, mean ages 45–68 years, with pathologies including knee arthroplasty (12 studies), chronic low back pain (8), rotator cuff repairs (6), stroke rehabilitation (5), and generalized musculoskeletal pain (14). Adherence was most frequently measured via patient self-report diaries (60%), with a smaller subset using electronic exercise logs or wearable activity monitors (25%). Overall, trials were rated low to moderate risk of bias; cohort studies scored 7–9 out of 9 on Newcastle–Ottawa, and qualitative research demonstrated methodological rigor (clear aims, appropriate designs).

Baseline Adherence Rates

Across control or usual-care groups, mean adherence to prescribed HEPs ranged from 35% to 60%, confirming substantial non-compliance. Drop-off was most pronounced after the second week, with a median 40% reduction in exercise completion logged by week four.

Behavioral Interventions

Behavioral Contracts and Goal Setting:

In five RCTs, patients who signed formal behavioral contracts specifying daily exercise goals and review points achieved a 30–40% absolute increase in adherence compared to controls. These contracts often included patient-defined SMART (Specific, Measurable, Achievable, Relevant, Time-bound) goals and scheduled weekly check-ins. One large trial (n=200) demonstrated that contract participants completed 85% of prescribed sessions over eight weeks versus 50% in the uncontracted group, and also reported greater self-efficacy scores.

Motivational Interviewing (MI):

Three trials embedded MI techniques within initial and follow-up therapy sessions. MI patients articulated personal motives and barriers, leading to a 25–35% improvement in exercise frequency over six weeks. Qualitative feedback highlighted increased intrinsic motivation and ownership of the program. Importantly, MI arms also showed modest secondary gains in pain reduction and function (e.g., 10–15% greater improvement on standardized functional scales).

Educational Strategies

Enhanced Instruction and Rationale:

Seven studies compared standard verbal instruction to extended education sessions that explained the pathophysiology and purpose of each exercise. Enhanced education arms demonstrated a 20–30% higher adherence in the first four weeks. Patients reported clearer understanding and perceived value, translating into more consistent performance of HEP.

Patient-Friendly Materials:

Three trials provided illustrated exercise booklets and video demonstrations via DVD or app. These materials increased adherence by 15–25%, especially among older adults who valued the ability to replay videos. Where booklets lacked clarity, adherence gains were attenuated, underscoring the need for high-quality visuals and concise language.

Technological Supports

Mobile Apps and Reminders:

Seven RCTs utilized smartphone applications that sent daily push notifications, tracked completion, and provided progress dashboards. Average adherence improved by 20–25% relative to non-app users. App engagement correlated strongly with adherence—participants who logged in ≥5 times per week completed 90% of exercises, while those logging <2 times completed 40%.

Wearable Sensors and Tele-Monitoring:

Four studies deployed wearable motion sensors synchronized to therapist portals. Objective monitoring allowed for real-time feedback and adjustments. Sensor-monitored groups maintained 80% adherence over eight weeks, compared to 55% in self-report groups. Qualitative interviews revealed that knowing performance was being tracked motivated patients and increased accountability.

Multi-Modal Approaches

Combination Interventions:

Six trials tested integrated strategies—e.g., behavioral contracts plus app reminders, or MI coupled with video education. These multi-modal protocols delivered the highest adherence gains, averaging 35–45% improvement over standard care. In one factorial RCT (n=300), the combined intervention arm achieved 92% adherence at week four versus 48% in usual care, and also exhibited superior functional recovery at three months (25% greater improvement on mobility scales).

Secondary Clinical Outcomes

While improved adherence generally correlated with better clinical outcomes, effect sizes varied by condition. In knee arthroplasty cohorts, each 10% increase in adherence was associated with a 5-point greater improvement on the Knee Injury and Osteoarthritis Outcome Score (KOOS). Chronic low back pain patients with ≥80% adherence reported 20% greater reduction in pain intensity and 15% higher disability index improvement. Qualitative studies echoed these findings, with patients attributing faster symptom relief and confidence in daily activities to consistent exercise behavior.

Conclusion

This comprehensive review elucidates that patient adherence to home exercise programs—traditionally hovering at 35–60%—can be substantially enhanced through targeted strategies. Behavioral interventions (contracts, goal setting, motivational interviewing) achieve absolute adherence gains up to 40%. Educational enhancements (clear rationale, visual materials) contribute 15–30% improvements, particularly when tailored to patient literacy and preferences. Technological supports (apps, wearable sensors, tele-monitoring) further bolster compliance by 20–25% and offer objective tracking. The most profound effects emerge from multi-modal protocols that synergize behavioral, educational, and technological elements, yielding adherence rates above 90% and translating into meaningful clinical benefits.

Clinical Implications:

- **Integrate Behavioral Contracts:** Collaboratively establish SMART goals and formalize commitments.
- **Leverage Technology:** Deploy user-friendly apps and, where feasible, motion sensors to provide reminders and accountability.
- **Enhance Education:** Use concise, high-quality visuals and videos to clarify exercise purpose and technique.
- **Apply Motivational Interviewing:** Address ambivalence and personalize motivation early in therapy.

Future Research:

Longitudinal studies should examine the durability of adherence gains beyond three months and their long-term impact on functional outcomes and healthcare utilization. Cost-effectiveness analyses are needed to guide resource allocation for technology investments. Moreover, implementation research can explore barriers and facilitators in diverse outpatient settings, ensuring that evidence-based adherence strategies are scalable and equitable. By prioritizing adherence as a modifiable determinant of rehabilitation success, clinicians can optimize patient recovery, reduce chronicity, and enhance the value of outpatient physical therapy.

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