Tab 1

# Systematic Literature Review of Occupational Therapy Mobile Health Applications

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### HIDS 7007: Digital Health Applications

**1. Introduction**Mobile health (mHealth) applications have increasingly become integral to rehabilitation, offering patients convenient access to therapy resources outside the clinic​ (Indraratna et. al, 2022). In post-operative and post-injury rehabilitation – particularly for the upper extremities – such apps can bridge gaps in care by providing guided exercises, progress tracking, and educational support on smartphones. The COVID-19 pandemic further accelerated adoption of remote rehab tools, highlighting the need for effective home-based therapy solutions​ (Chae et. al, 2020). Early evidence suggests that well-designed mHealth interventions can enhance rehabilitation outcomes. For example, a smartwatch-based home program for stroke survivors improved arm motor function and shoulder range-of-motion compared to standard care ​(Chae et. al, 2020). Similarly, a smartphone app for hand arthritis (integrating exercise and self-management) led to better hand function and pain reduction than usual care (Rodríguez Sánchez-Laulhé et al, 2022). Given this potential, the purpose of this review is to synthesize findings from recent studies to address key questions about mobile app use in rehabilitation. In particular, we focus on how existing apps for upper extremity rehabilitation are designed and what features make them effective. The goal is to extract insights that will inform the development and deployment of a new Occupational Therapy Rehabilitation Tracking App aligned with best practices and patient needs.

**2. Methodology**We undertook a structured literature review of the studies provided, which encompass systematic reviews, randomized controlled trials, and app design papers related to mHealth in rehabilitation. A systematic approach was used to identify and analyze content relevant to post-operative upper extremity rehabilitation. Key information (e.g., app functionalities, user engagement metrics, clinical outcomes) was extracted from each study and organized according to the research questions. We then compared findings across studies to discern common themes and conflicting results. This narrative synthesis emphasizes app-based interventions for upper limb rehab, while also drawing on broader telehealth evidence (such as cardiac telerehabilitation) when applicable for generalizable insights. All source citations are provided in APA style using the line reference format for precision.

**3. Findings and Discussion**

***State of the Art in Mobile Rehabilitation.***Mobile apps are now employed in various rehabilitation domains, including post-surgical upper extremity care. A number of condition-specific apps have been developed by clinicians and researchers – for example, apps targeting lateral or medial elbow tendinopathy (“tennis elbow” or “golfer’s elbow”) that provide exercise programs for pain relief​ (Heales et. al, 2017) (George et. al, 2018). These typically fall under the health and fitness category on app marketplaces and offer patients guided therapy routines at home. Likewise, specialized apps exist for hand rehabilitation in arthritis or neurological conditions, and even for chronic pelvic pain therapy​ (Díaz-Mohedo et. al, 2024), indicating a broadening landscape of mobile rehab tools. Many of these apps are designed to be user-friendly and interactive, incorporating features like exercise videos and symptom diaries. However, the scientific evidence backing individual apps varies. Some, especially older or commercial apps, lack validation from randomized trials (George et. al, 2018), whereas newer apps are increasingly tested in clinical studies. For instance, researchers have begun conducting trials on apps such as a wearable-integrated stroke rehab system and a rheumatoid hand exercise app, demonstrating feasibility and positive outcomes ​(Chae et. al, 2020) (Rodríguez Sánchez-Laulhé et al, 2022). Overall, the trend in mobile rehabilitation is toward more comprehensive, clinically-informed apps, often in response to challenges in accessing traditional in-person therapy. Patients have generally been receptive to these digital interventions – a review of telerehabilitation notes high acceptability when apps are convenient, flexible, and easy to access​ (Subedi et al, 2020). Thus, the current state of the art reflects a mix of emerging evidence-based applications and a recognition of mHealth as a valuable adjunct to conventional rehabilitation.

***Functionality Effectiveness.***Across the literature, several core functionalities have been identified in rehabilitation apps, each contributing to recovery in distinct ways. **Guided exercise instruction** is a foundational feature. Most apps include libraries of therapeutic exercises, often presented with pictures or video demonstrations, and audio cues ​(George et. al, 2018). This multimedia guidance enables patients to perform exercises correctly on their own time. For example, the “PT and OT Helper” app for golfer’s elbow plays a real-time video with voice instructions and a repetition countdown for each exercise, effectively mimicking a therapist’s supervision in-home (George et. al, 2018). Such guidance has been reported to improve user confidence and ensure proper technique, which is critical for effectiveness. One caveat noted is that passive viewing of videos does not guarantee active participation – if a patient lets the exercise video play out without doing the movements, the app may count it as completed (George et. al, 2018). Therefore, while video-guided exercises are effective for instructing patients, they work best in tandem with features that confirm the user’s actual performance (such as requiring input or using sensors).

**Progress tracking and compliance monitoring** are another set of crucial functionalities. Rehabilitation apps often include tools for patients to record their activities and symptoms, which can reinforce adherence. A prime example is an app for tennis elbow that provides a built-in diary: users log the number of exercise repetitions completed and rate their pain intensity on a color-coded scale each day​ (Heales et. al, 2017). This daily tracking mechanism, combined with an exercise-duration timer, helps patients monitor their progress over time and stay accountable to their stretching routine​ (Heales et. al, 2017). Such self-monitoring is associated with better compliance, as it engages patients in reflecting on their improvement. Indeed, providing real-time feedback on performance can motivate users – evidence suggests that immediate assessment results during rehab sessions increase patient interest and reduce drop-off​ (Fu et. al, 2024). Advances in smartphone technology have further enhanced compliance monitoring; some apps leverage built-in sensors or wearables to detect and record exercises automatically. For instance, a home-based stroke rehab system used a smartwatch’s accelerometer/gyroscope to recognize specific arm exercises and tally their frequency​(Chae et. al, 2020). By objectively tracking each movement, the system ensured patients were actually doing the exercises and not just reporting them. This automated monitoring proved effective, as the study observed significantly greater training participation and functional gains in the app users ​(Chae et. al, 2020). In summary, functionalities that track progress – whether through self-reported diaries or sensor-driven logs – play a vital role in improving exercise adherence and enable tailored feedback to the patient.

**Provider-patient communication** features further augment an app’s impact by maintaining a link to clinicians. While not all rehab apps have direct messaging or teleconsultation, many incorporate some form of data sharing or oversight by therapists. The stroke rehabilitation platform above is one example: it transmitted the patient’s exercise data to remote therapists, allowing them to review compliance and adjust the program as needed​ (Chae et. al, 2020). Even without live chats, this kind of telemonitoring creates a safety net; a therapist can intervene if a patient is under-performing or experiencing issues. Users tend to value this connectedness – qualitative feedback highlights that patients appreciate interactive support and knowing their provider is keeping an eye on their progress​(Subedi et al, 2020). In one telerehab study, participants cited real-time feedback and individualized guidance as especially motivating components of the intervention​(Subedi et al, 2020). Thus, an app that facilitates provider involvement (through progress reports, alerts, or consultations) can enhance accountability and personalize the rehab experience. Additionally, **educational content** and self-management guidance embedded in apps contribute to effectiveness. Some apps include educational modules about the condition or injury, exercise tips, and recovery advice. For example, the tennis elbow app delivers educational information on causative factors and stresses the importance of staying active with proper technique, aligning with clinical guidelines​(Heales et. al, 2017). The inclusion of tips (like stress-relief strategies for muscle tension) and precautions (when to stop exercises and seek help) in the app’s content supports patients in managing their rehabilitation safely​(Heales et. al, 2017). Such informational resources empower patients, potentially improving their adherence and confidence in the rehab process. In summary, the most effective app functionalities identified in the literature are those that actively engage the patient (through guided exercises and feedback), keep the patient on track (via tracking and reminders), facilitate expert oversight, and educate the patient about their therapy – all of which synergistically contribute to better recovery outcomes.

***Comparative Analysis of Interventions.***Existing rehabilitation apps vary in their emphasis on these functionalities, and these differences can influence patient adherence and clinical outcomes. Simpler apps with a narrow focus provide basic exercise regimens but may lack adaptability. For instance, the *Tennis Elbow* app centers almost exclusively on a prescribed stretching program for lateral elbow pain​ (Heales et. al, 2017). It offers a set of five stretches with a fixed progression algorithm that increases or decreases the number of repetitions based on the user’s reported pain levels​(Heales et. al, 2017). While this approach ensures a structured routine, it does not encompass strengthening exercises – a noted limitation since strengthening is recommended for tendon injuries​(Heales et. al, 2017). In practice, such one-size-fits-all interventions might yield some benefit (stretching can relieve pain), but they risk under-performing due to their rigidity. Users of the tennis elbow app cannot modify the exercises or adjust the program beyond what the app dictates, which drew criticism for not accommodating individual needs or current evidence​(Heales et. al, 2017) ​(Heales et. al, 2017). By contrast, more comprehensive apps provide a multidimensional intervention and tend to report better patient engagement. The *PT and OT Helper: Golf Elbow* app, for example, includes 17 different exercises (addressing both wrist/forearm and general upper limb strengthening) and allows a clinician-patient team to customize an exercise regimen from this library (George et. al, 2018). The ability to tailor the program – selecting appropriate exercises and setting the number of sets, repetitions, and resistance – means therapy can be individualized to the patient’s condition and progress. This personalization aligns with the principle that “one size does not fit all” in rehabilitation, presumably improving patient buy-in. Although high-quality outcome data for that specific app are lacking, its design is grounded in clinical reasoning, suggesting it could enhance adherence by targeting exercises to what the patient needs most.

Apps that combine multiple functionalities (exercise guidance, tracking, education, and communication) appear to achieve the greatest impact on adherence and outcomes. The *CareHand* app for rheumatoid arthritis in the hands illustrates this well. It provided users with a tailored home exercise program along with self-management tips and a symptom tracking diary​ (Rodríguez Sánchez-Laulhé et al, 2022). Patients using CareHand could see graphical representations of their progress – for instance, improvements in hand mobility and reductions in pain over weeks – which likely reinforced their commitment to the routine (Rodríguez Sánchez-Laulhé et al, 2022). In a randomized trial, those who used the app for 3 months showed significantly better hand function, work performance, and pain levels than those who received standard exercise instructions on paper (Rodríguez Sánchez-Laulhé et al, 2022). Notably, the app users also reported higher satisfaction with their recovery (Rodríguez Sánchez-Laulhé et al, 2022). In contrast, the control group (without the interactive app) had lower adherence to the exercise regimen, highlighting how the app’s features (like reminders, videos, and tracking) helped patients stick with therapy. Another comparative point is the role of technology in objectively monitoring exercises. Traditional apps rely on patient self-report – which can be prone to error or overestimation – whereas newer interventions use technology for verification. The smartwatch-based stroke rehabilitation system objectively logged each exercise repetition via sensor data and was associated with a marked improvement in exercise frequency compared to a control group with no such system ​(Chae et. al, 2020). This suggests that when patients know their performance is being measured (and potentially viewed by their therapist), they may be more diligent, thus improving adherence. Moreover, it ensures more accurate reporting of compliance, allowing better adjustments to therapy plans.

Clinical outcomes tend to mirror the level of functionality and engagement an app provides. In studies where apps were rigorously tested, the interventions with richer feature sets (e.g., combined exercise + tracking + education + feedback) not only improved intermediate outcomes like adherence, but also led to superior clinical results. The stroke app improved objective functional scores (Wolf Motor Function Test) and shoulder range of motion in patients over 12 weeks, whereas the control group doing self-guided home exercise saw minimal gains​ (Chae et. al, 2020). The rheumatoid arthritis app similarly outperformed usual care in improving patients’ functional status and pain, at least in the short to medium term(Rodríguez Sánchez-Laulhé et al, 2022). On the other hand, apps that have not been formally evaluated (or that target outcomes not easily measured) remain of uncertain benefit. The elbow apps mentioned earlier, for example, have no published trials confirming their efficacy – their value is inferred from user convenience and theoretical benefit of exercise, but we lack data on long-term patient outcomes. Some concerns were raised in those app user-guide reviews: if an app’s content is not evidence-based (as with the tennis elbow app’s debatable rationale for stretching) or if it omits key therapy components, it may fail to produce optimal results​ (Heales et. al, 2017). In sum, comparing these interventions suggests that **the more an app can engage patients through personalization, feedback, and professional support, the better the adherence and likely the clinical outcomes**. Apps vary widely, but the trend is that multifaceted, interactive interventions (often developed with clinical expert input) have an edge in improving rehabilitation success, whereas simplistic or inflexible apps may offer only modest benefits.

***Actionable Design Insights.***Drawing on the strengths and weaknesses identified in existing mobile rehabilitation apps, several design considerations emerge for the new Occupational Therapy Rehabilitation Tracking App:

* **Comprehensive Exercise Guidance:** Provide a robust library of exercises relevant to post-operative upper extremity rehab, each with clear instructions. Incorporate video demonstrations with audio guidance and on-screen cues (timers, counters) to ensure patients perform movements correctly​  
  (George et. al, 2018)  
  . This multimedia approach can substitute for in-person demonstration and reinforce proper technique. Including both stretching **and** strengthening exercises (as appropriate for the condition) is important; apps that focused only on one modality missed key aspects of therapy​(Heales et. al, 2017). All exercise content should be vetted against current evidence so the app only promotes safe, effective practices.
* **Personalized Therapy Programs:** Enable therapists and patients to co-create individualized exercise routines within the app. For example, the app can allow a clinician to select specific exercises from the library, set the number of sets/reps or duration for each, and tailor difficulty to the patient’s current ability​  
  (George et. al, 2018). This routine would then be assigned to the patient for home use. Supporting personalized plans ensures the therapy is relevant to each user – addressing the exact surgical recovery or injury needs – rather than a generic plan. The app should also allow adjustments over time (e.g., progress to harder exercises or increased reps as the patient improves, or regress if pain flares up). Built-in algorithms can suggest progressions, but always with the option for clinician override to fit individual cases. A personalized approach was a success factor in apps like CareHand, which tailored content to users and showed better outcomes as a result(Rodríguez Sánchez-Laulhé et al, 2022).
* **Progress Tracking and Feedback:** Implement interactive tracking tools so that patients (and providers) can monitor progress objectively. This could include an **exercise log** or diary where the app records each completed session – either via user input or automatically via sensors. For instance, patients might log their pain level before and after exercises each day, using a simple visual analog scale, similar to the color-coded pain rating in the tennis elbow app​  
  (Heales et. al, 2017). The app can graph these metrics over time, giving users visual feedback on improvements (e.g., a trend of decreasing pain or increasing range of motion). Such graphical progress dashboards have been shown to promote positive self-management habits and motivate continued adherence (Rodríguez Sánchez-Laulhé et al, 2022). Whenever possible, leverage smartphone capabilities for **automated monitoring**: the app could use the phone’s sensors or camera to measure movement (for example, goniometer functionality to measure joint angles, as seen with the Curovate app for knee rehab, which reliably quantified range of motion ​(Shah et. al, 2022)). By validating that exercises are performed correctly and fully, sensor feedback increases accountability. The app might, for example, detect if the user reaches the target arm elevation or elbow bend angle, and only then count a repetition. Immediate feedback or encouragement can be provided (“Great job – 10 reps completed!”), emulating a therapist’s praise. Overall, robust tracking and feedback loops will help patients stay engaged and allow for timely modifications to the program if progress stalls.
* **Patient-Provider Connectivity:** Design the app to keep therapists in the loop on their patients’ rehabilitation. This could include a secure clinician portal or dashboard where therapists can review data on exercise completion, pain scores, or any red flags. In the stroke rehab study, remote therapists monitored exercise data and that oversight was linked to better adherence​ (Chae et. al, 2020); similarly, our app should notify therapists if a patient is struggling (e.g., repeatedly missing sessions or reporting high pain). Two-way communication features are highly recommended – for instance, an in-app messaging system or scheduled telehealth check-ins. Patients frequently value having access to their provider for questions or feedback during home rehab​(Subedi et al, 2020). Even brief feedback (“Your range of motion has improved this week – keep it up!” or suggestions if problems arise) can boost morale and adherence. From a design standpoint, any such communication must be secure (HIPAA-compliant) and user-friendly. If real-time communication isn’t feasible, consider automated feedback generated by the app based on performance (e.g., adaptive messages or tips). The key is to avoid patients feeling “on their own” with the app; integrating the healthcare provider’s guidance makes the app an extension of clinical care rather than a standalone gadget.
* **Educational and Self-Management Resources:** Embed educational content into the app to support patients’ understanding of their condition and the rehab process. This might take the form of brief articles, FAQs, or even short quizzes/videos about topics like joint protection techniques, proper ergonomics, swelling management, or the importance of adherence. In CareHand, an educational section provided information on managing rheumatoid hand issues (e.g., how to protect joints during daily tasks)​ (Rodríguez Sánchez-Laulhé et al, 2022). Our app should do similarly for postoperative care – for example, teaching signs of overexertion vs. normal soreness, strategies for pain control, and when to contact the therapist. Providing this information within the app is more effective than expecting patients to find reliable info on their own. Additionally, include guidance on general health habits that support recovery (sleep, stress reduction, etc.), as these can influence rehabilitation outcomes. The tennis elbow app’s inclusion of stress-relief suggestions acknowledged how lifestyle factors affect muscle tension and symptoms​(Heales et. al, 2017). By giving patients a well-rounded knowledge base and self-management tips, the app can empower them to take an active role in their recovery, which is linked to better outcomes.
* **Usability and Accessibility:** Employ a user-centered design approach from the outset to ensure the app is intuitive for a wide range of users​ (Díaz-Mohedo et. al, 2024). This means conducting usability testing with actual patients (and therapists) during development, incorporating their feedback to refine the interface. For instance, in one design study an iterative prototyping with user testing helped pinpoint content and interface issues, leading to a more user-friendly final app​(Díaz-Mohedo et. al, 2024)​(Díaz-Mohedo et. al, 2024). Key usability considerations include: simple navigation (clear menus for Exercises, Progress, Messages, etc.), readable text and captions on videos, and avoidance of medical jargon or confusing terms (the tennis elbow app demonstrated how confusing terminology can hamper user experience ​(Heales et. al, 2017)). The app should also cater to diverse users by offering **multi-language support** if possible; a new rehab app was successfully translated into four languages to broaden accessibility​ (Díaz-Mohedo et. al, 2024), which we should emulate given the diverse patient population. Furthermore, accessibility features (like adjustable font sizes or voice-over compatibility for visually impaired users) will make the app usable by patients with varying needs. Another practical aspect is ensuring privacy and security: each patient should have a secure login so their data remains confidential (one older app lacked logins for multiple users, raising privacy concerns when used in group settings (George et. al, 2018)). Data encryption and compliance with health data regulations must be in place since the app will handle personal health information. Finally, ensure the app runs on common devices (both Android and iOS) and does not require expensive add-ons – keeping the cost low or free improves adoption, as high upfront fees were noted as a barrier in some commercial apps(George et. al, 2018).
* **Motivation and Adherence Strategies:** To maximize long-term adherence, the app should include features that incentivize regular use. Push notification reminders can be sent for scheduled exercise times or if the app detects a lapse in usage (“It’s time for your therapy – let’s keep the momentum going!”). Goal-setting features allow patients and therapists to set weekly targets (e.g., number of sessions to complete), and the app can congratulate users when goals are met, or gently prompt them if they fall behind. Some apps use gamification elements – for instance, earning points or badges for consistency – which can make the rehab process more engaging. While none of the reviewed studies explicitly used gamification, the principle of rewarding adherence is aligned with their findings that continuous engagement is crucial​ (Fu et. al, 2024). Even simple motivational messages based on progress (like celebrating a new personal record in range of motion) can encourage patients to stick with the program. Lastly, building in a community aspect (if appropriate and privacy-compliant) could be beneficial: for example, optional forums or group challenges for patients recovering from similar surgeries. Social support can be a powerful motivator; patients often compare themselves with others in therapy and derive encouragement from shared experiences (as noted qualitatively in rehab settings)​file-twupxtne94w2cdwkmuvbjt. An app-facilitated community or peer support system might enhance motivation, though it should be carefully moderated.

By incorporating these design insights, the new OT Rehabilitation Tracking App can leverage the successes of prior apps and avoid their pitfalls. The overarching aim is to create an application that is **engaging, personalized, and clinically effective** – one that helps patients complete their rehab regimen and achieve better outcomes, while also providing therapists with a useful tool to monitor and support their patients remotely.

**4. Conclusion**This literature review highlights that mHealth applications have a significant positive impact on rehabilitation when thoughtfully implemented. Mobile apps in the rehabilitation sphere – especially for upper extremity recovery – have evolved to offer interactive exercise training, progress monitoring, and educational support, all of which can enhance patient engagement in therapy. Key findings indicate that apps which incorporate evidence-based exercises, personalized regimens, and real-time feedback tend to improve patient adherence and functional outcomes​ (Chae et. al, 2020) (Rodríguez Sánchez-Laulhé et al, 2022). In contrast, apps with limited scope or poor alignment with clinical best practices may yield suboptimal results, underscoring the need for a comprehensive approach​(Heales et. al, 2017). Across the studies, common strengths included the use of multimedia exercise guidance, tracking tools to visualize progress, and mechanisms for patient-provider communication – features that collectively motivate patients and keep care on track. Importantly, a combination of exercise and self-management education (as seen in multimodal apps) was more effective than exercise alone(Rodríguez Sánchez-Laulhé et al, 2022)(Rodríguez Sánchez-Laulhé et al, 2022), pointing to the value of empowering patients with knowledge and support.

In designing the new Occupational Therapy Rehabilitation Tracking App, we recommend integrating the above evidence-based elements. The app should be user-friendly and tailored to individual patient needs, offering a rich array of functions from guided workouts to symptom logging and feedback alerts. By doing so, the app can facilitate higher patient adherence to rehab protocols, much like prior successful interventions that reduced drop-out and even improved long-term health outcomes (e.g., better range of motion, lower pain, and higher completion of rehab programs)​ (Chae et. al, 2020) ​(Indraratna et. al, 2022). Additionally, ensuring the app is developed with input from both clinicians and end-users (patients) will maximize its relevance and usability. In conclusion, mobile rehabilitation apps represent a powerful tool to extend the reach of occupational therapy beyond the clinic. By synthesizing the lessons learned from current state-of-the-art applications, the deployment of our new OT Rehabilitation Tracking App can be optimized to support patients’ recovery journeys, ultimately improving functional results and quality of life for individuals undergoing upper extremity rehabilitation.

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Tab 2

### **Key Findings from the Literature Review:**

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**Patel, B., & Thind, A. (2020).** Usability of mobile health apps for postoperative care: Systematic review. *JMIR Perioperative Medicine, 3*(2), e19099.<https://doi.org/10.2196/19099>

1. **Growing Use of mHealth Apps for Post-Op Care:**
   * Mobile health (mHealth) apps are widely used for monitoring, educating, and rehabilitating post-op patients.
   * These apps help in early discharge, reducing follow-ups, and detecting complications early​periop-2020-2-e19099.
2. **Current Issues in Usability Research:**
   * Most existing studies focus only on patient satisfaction, neglecting system functionality and usefulness.
   * Few apps are evaluated with validated usability tools such as the Mobile App Rating Scale (uMARS) or mHealth App Usability Questionnaire (MAUQ)​periop-2020-2-e19099.
3. **Common Functionalities in mHealth Apps for Surgery Recovery:**
   * Symptom & Wound Monitoring (26 studies).
   * Education & Guidance on post-op care (8 studies).
   * Physiotherapy & Rehabilitation Tracking (5 studies).
   * Communication & Telemedicine (5 studies)​periop-2020-2-e19099.
4. **Data Collection Methods:**
   * Manual input by patients for symptoms, pain scores, and medication adherence.
   * Wearable integration for activity tracking, range of motion, and vitals monitoring.
   * Clinician dashboards to visualize trends and support remote monitoring​periop-2020-2-e19099.
5. **Barriers to Adoption:**
   * Low engagement: Many users abandon apps quickly due to usability issues.
   * Limited clinical validation: Few Randomized Controlled Trials (RCTs) exist to prove effectiveness.
   * Security & Compliance Risks: Apps must meet HIPAA and other privacy regulations

### **Implications for Your App Design**

Based on this literature review, our app will prioritize:

* **User-Centered Design** – Ensuring accessibility for older adults and mobility-challenged users.
* **Validated Usability Testing** – Using **MAUQ** or **SUS (System Usability Scale)** for systematic evaluation.
* **Remote Monitoring & Clinician Collaboration** – Secure messaging and dashboards for real-time feedback.
* **Integration with Wearables** – Tracking key rehab metrics like **range of motion, grip strength, and activity levels**.
* **Gamification & Engagement Strategies** – Motivating patients with progress badges, reminders, and peer support.

#### **Research Existing Apps**

1. **MoveUP**:
   * Focus: A rehabilitation platform designed for post-surgical recovery, particularly for joint replacements.
   * Key Features:
     + Tracks patient activity and progress using wearables.
     + Provides exercise plans tailored to patient needs.
     + Integrates patient-reported outcomes into a clinical dashboard.
   * Limitations:
     + Primarily focuses on physical rehabilitation rather than occupational therapy.
     + Limited interactive features for patient engagement (e.g., no gamification or goal-setting tools).
     + Emphasis on exercise compliance rather than daily activity adjustments.
2. **Knee+**:
   * Focus: Rehabilitation for knee surgery patients, emphasizing mobility recovery.
   * Key Features:
     + Step-by-step exercise guidance with videos.
     + Tracking of range of motion via manual inputs or wearable devices.
   * Limitations:
     + Lacks a comprehensive dashboard for providers to monitor progress remotely.
     + Does not provide educational resources for post-surgical care beyond exercises.
     + Lacks support for occupational therapy, such as guidance on regaining independence with daily activities.

3. **Curovate**

* + Focus: Guide patients through rehab with personalized plans and exercise tracking.
  + Key Features:
    - **Video-Guided Exercises:** Provides daily instructional videos to guide users through rehabilitation exercises tailored to their specific surgery or injury.
    - **Range of Motion Measurement:**Utilizes smartphone sensors to measure knee flexion and extension, allowing users to monitor their progress at home.
  + Limitations
    - Access to all features requires a subscription, which might be a financial burden for some users.

1. **General Observations of Existing Apps**:
   * Many apps focus heavily on physical therapy rather than integrating occupational therapy needs, such as regaining the ability to perform daily tasks like dressing, cooking, or personal care.
   * Limited focus on patient education about recovery, pain management, and adapting to life after surgery.
   * Few solutions address engagement and motivation through gamification or community support.

#### **What’s Missing?**

* **Integration of Occupational Therapy**:
  + Few apps offer tailored rehabilitation content for occupational therapy (e.g., regaining fine motor skills, using assistive devices).
  + Lack of structured programs for guiding patients through daily activities critical for independence.
* **Provider Dashboards**:
  + Current apps provide minimal tools for occupational therapists to monitor patient progress remotely, adjust care plans, or communicate directly with patients.
* **Patient Engagement and Motivation**:
  + Apps lack gamification features, which can increase patient adherence and motivation.
  + Community features, such as forums or peer support groups, are underutilized but could help patients share experiences and foster a sense of connection during recovery.

#### **How Your App Fills the Gap**

1. **Tailored Occupational Therapy Content**:
   * Offers guidance on exercises and activities designed to help patients regain independence with daily living tasks, such as dressing, cooking, and grooming.
   * Includes fine motor skill training and strategies for managing fatigue or pain during recovery.
2. **Comprehensive Patient-Provider Platform**:
   * Combines patient-facing tools (e.g., exercise guidance, progress tracking) with a robust provider dashboard.
   * Allows occupational therapists to:
     + Monitor real-time progress on metrics like range of motion, pain levels, or task completion.
     + Customize exercise and activity plans for individual patients.
     + Communicate directly with patients through the platform.
3. **Enhanced Engagement**:
   * Adds gamification elements, such as badges, streaks, or leaderboards, to incentivize adherence to rehabilitation routines.
   * Provides educational content, such as short videos or infographics, to help patients better understand their recovery journey and expectations.
   * Integrates community support features, allowing patients to connect with peers who are undergoing similar recovery experiences.

### **Scope of Features**

#### **Core Features (MVP)**

1. **Guided Exercises and Activity Plans**:
   * Deliver step-by-step instructions for occupational therapy exercises, tailored to the patient’s surgical procedure and progress.
   * Include videos and visual aids for proper execution.
2. **Patient Progress Monitoring / Data Collection**:
   * Capture metrics like:
     + Range of motion (via wearables or manual input).
     + Pain and discomfort scores (patient-reported through surveys).
     + Daily activity levels and task completion.
3. **Provider Dashboard**:
   * Allow therapists to:
     + Review patient progress in real-time.
     + Adjust exercise and activity plans remotely.
     + Identify patients who need additional intervention or support.
   * Include notifications or alerts for significant changes (e.g., worsening pain scores).

#### **Advanced Features (Future Iterations)**

1. **Gamification**:
   * Introduce rewards for achieving milestones (e.g., completing daily exercises, maintaining streaks).
   * Add progress tracking visuals, such as graphs or achievements.
2. **Community Support**:
   * Offer chat forums or group discussions for patients recovering from similar surgeries.
   * Include moderated Q&A sessions with occupational therapists.
3. **Telehealth Integration**:
   * Enable video consultations between patients and therapists for personalized feedback.
   * Include secure messaging for quick questions or updates.
4. **Wearable Device Compatibility**:
   * Integrate with devices like smartwatches to automatically track range of motion, steps, or activity levels.
   * Provide real-time feedback on patient performance during exercises.
5. **Educational Resources**:
   * Include multimedia content (e.g., videos, infographics) on post-surgery care, pain management, and adapting to daily life challenges.
   * Offer personalized tips based on the patient’s recovery stage and progress.

#### **Expansion Potential**

* Develop condition-specific modules (e.g., hand therapy for wrist surgeries, lower-limb therapy for hip or knee replacements).
* Partner with healthcare providers or hospitals to integrate the app into existing patient care workflows.