

A Unique Approach to Increasing Patient Adherence through the use of Trackable Technology: A Case Report

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Introduction

Poor patient adherence is an ongoing concern of physical therapists when prescribing home exercise programs (HEPs) as they aim to encourage patient self-management of conditions and promote acceptance of responsibility for rehabilitation. It is estimated that nearly two-thirds of patients receiving HEPs from a physical therapist do not adhere to the program or perform exercises as prescribed due to a number of identified barriers. With the rates of non-adherence to medical recommendations being so prevalent, it is beneficial for physical therapists to implement new strategies to improve patient adherence and outcomes. Recent trends in healthcare have involved the use of trackable technology through software applications, such as mobile apps, as an alternative cost-effective and convenient method of issuing HEPs to promote and improve patient adherence.

Patient History/Systems Review

- 60 y.o. athletic female with four-month history of intermittent, sharp pain along medial joint line of right knee with occasional clicking sensations
- Symptoms increase with functional movement, including stair ambulation, transfers, squatting and kneeling, limiting her ability to engage in physical activity such as yoga, low-intensity strength training and horseback riding
- PMH: osteoporosis, arthritis, breast and uterine cancer, receiving two bouts of radiation and in remission for 10 years
- Prior Tx: two corticosteroid injections to right knee
- Primary goal: to decrease pain and return to PLOF and physical activity
- Personal desire to limit number of in-person sessions due to paying out of pocket for services

Examination

- Completed Boston University AM-PAC Generic Basic Mobility Outpatient Short Form: raw score 52
- Edema anteriorly and along medial joint line of right knee
- Restricted, painful AROM of right knee and pain and weakness noted with both right knee flexion and extension
- Positive McMurray, Apley, and Thessaly tests
- Able to perform 60% of deep squat before pain response

Clinical Impression

- Patient presentation consistent with a tear of the medial meniscus of the right knee; positive for 4/5 criteria of cluster described by Lowery et al. (2006)
- Conservative physical therapy management of meniscal tears and knee arthroscopy have been found to have similar effectiveness for pain relief in active populations
- With patient's primary goal to decrease pain to return to prior level of function, she was considered a good candidate for conservative management
- This patient was considered a good candidate for the intervention due to:
 - Prior high level of activity and having active wellness membership at PT clinic
 - Ability to achieve near-full ROM with minimal increase in pain
 - Desire to prevent high cost of in-person sessions
 - Literature demonstrating positive results with conservative management of meniscus tears

Intervention

- Mywellness® app is part of the Technogym® integrated online platforms, can be used by health professionals with Technogym equipment to prescribe efficient HEPs and deliver them to patients instantly via the cloud
- PTs can add/update exercises through the web-based portal and instantly get in touch with patients through the in-app chat feature
- Mywellness® app enables PTs to check the compliance of patients to prescribed HEPs through the individual's daily task log
- The case patient's plan of care: To be seen in-person once a week, for five weeks, while completing HEP via the Mywellness® app at the wellness center facility two times a week until discharged from PT
- Conservative care provided by PT during in-person sessions included patient education on joint protection techniques and activity modification, cold packs for edema/pain control, and review/modification of prescribed HEP
- Patient received no other co-intervention or corticosteroid injection during the PT plan of care

Parameters of Prescribed HEP	Initial: 01/21/19 Sets, Reps, Resistance (lbs)	Progression: 02/01/19 Sets, Reps, Resistance (lbs)
Leg Extension	2 x 10 x 30	3 x 10 x 30
Leg Curl	2 x 10 x 20	2 x 10 x 25
Leg Press	2 x 10 x 90	2 x 10 x 100
Palloy Press	2 x 10 x 15	2 x 10 x 15
Core Rotation	2 x 10 x 15	2 x 10 x 15
TRX Assisted Squat	---	2 x 10 x ---
TRX Single Leg Squat	---	2 x 8 x ---
Multiplanar Lunges	---	2 x 5 x 0.5
Kettlebell Deadlift	---	2 x 10 x 20
Single Leg Deadlift	---	2 x 10 x 20

Legend for Prescribed Exercises
 X – Exercises prescribed initially
 / – Exercises prescribed at follow-up PT session

	1/18	1/21	1/25	1/28	2/01	2/04	2/06	2/11	2/15	2/19	2/21	2/22
Leg Extension				X		X	X	X	X	X	X	
Leg Curl				X		X	X	X	X	X	X	
Leg Press				X		X	X	X	X	X	X	
Palloy Press						X	X	X	X	X	X	
Core Rotation				X		X	X	X	X	X	X	
TRX Assisted Squat						/	/	/	/	/	/	
TRX Single Leg Squat						/	/	/	/	/	/	
Multiplanar Lunges						/	/	/	/	/	/	
Kettlebell Deadlift						/	/	/	/	/	/	
Single Leg Deadlift						/	/	/	/	/	/	

Outcomes

- Outcome of implementing a HEP utilizing Mywellness® app was measured by assessing percentage of sessions the patient adhered to her prescribed HEP
- Adherence to HEP was considered sufficient if adherence to the number of bi-weekly sessions and performance of all prescribed exercises exceeded 70%
- 70% has been considered sufficient in previous studies of the same nature and exceeds the threshold for moderate levels of adherence in literature
- During 5 week episode of care, patient completed 7/10 sessions of HEP for overall adherence of 70%
- Of 7 completed sessions, patient was 100% adherent to all exercises during 5 sessions, 80% during one session, and 70% for another session
- Patient's overall in-session adherence rate was 74.1%
- Patient's AM-PAC score improved 11pts, demonstrating significant improvement in functional ability (MDC: 4.28)

Table 1. Patient's Range of Motion and Strength Measurements

	AROM (L) Knee	AROM (R) Knee	MMT (L) Knee	MMT (R) Knee
Flexion at Evaluation	150°	139°	5/5	4-/5 with pain
Extension at Evaluation	0°	- 2°	5/5	4-/5 with pain
Flexion at Discharge	150°	148°	5/5	5/5
Extension at Discharge	0°	0°	5/5	5/5

Table 2. Boston University AM-PAC Basic Mobility Outpatient Short Form

Initial Evaluation	Discharge
Raw score: 52	Raw Score: 63

MDC: 4.28

Discussion

- Based on patient outcomes and reported adherence levels, it can be suggested that the use of the Mywellness® app is successful in promoting patient adherence to HEPs and overcoming commonly perceived patient barriers
- Trackable technology acts as potential solution to limit high-cost of in-person PT sessions while achieving positive therapeutic outcomes
- Limitations of utilizing trackable technology apps include the patient's responsibility to self-report adherence levels
- Future studies are needed to investigate use of trackable technology for monitoring and promoting patient adherence to HEPs to determine if there is a positive effect in a large population

References: See Handout with Reference List