



Academy of Orthopaedic Physical Therapy, APTA, Inc.

Grant Program

Final Report Form

Date: 8/3/2022

Name of Investigators: Travis Gunderson, PT, DPT, OCS, FAAOMPT, Jason Beneciuk, PT, DPT, PhD, MPH, FAAOMPT, Joel Bialosky, PT, PhD, OCS, FAAOMPT, Haley Russell, PhD, Terese Chmielewski, PT, PhD, SCS
 Name of Grant: Physical Therapists Readiness for Change in the Management of Fear of Re-injury after ACL Reconstruction
 Award Period: 6/4/2020 to 6/3/2022 (Initial award date is the date that the award was made to your institution)

The final report is due no later than 60 days after the end of the award date.

1. Briefly summarize major accomplishments of this project (2-4 pages)

2. Provide a one-paragraph summary of results or abstract suitable for posting on the Academy website.

3. Attach a list of your publications published or accepted during the past year, or currently being written. Send reprints when available. List presentations made and abstracts accepted for presentation based on this work. Indicate with an asterisk (*) those publications supported by Academy of Orthopaedic Physical Therapy funding.

Budget:
 4. Provide a budget, using the original approved budget. Indicate total funds spent to date per major categories. If there was $\geq 25\%$ deviation (greater or less spent) of use of funds for any of the budget category, please BRIEFLY indicate the rationale.
 5. Budget: please send out a final print-out from your institution indicating monies spent per major categories.

 _____ Your Signature	<u>8/4/2022</u> _____ Date
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Return to:

Tara Fredrickson, Executive Associate
 Academy of Orthopaedic Physical Therapy, APTA, Inc.
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 tfred@orthopt.org

Academy of Orthopaedic Physical Therapy, APTA, Inc. Grant Program Final Report Form

Date: 8/3/2022

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Name of Grant: Physical Therapists Readiness for Change in the Management of Fear of Re-injury after ACL Reconstruction

Award Period: 6/4/20 to 6/3/2022 (Initial award date – date on contract as start date)

1. Briefly summarize the major accomplishments of this project (2-4 pages):

A. SURVEY DEVELOPMENT – May 2020 through October 2020

IRB approval was obtained on 5/27/2020. Shortly after IRB approval, Dr. Chmielewski (Primary Mentor) was placed on furlough secondary to the COVID-19 pandemic. Funding from the Academy of Orthopaedic Physical Therapy (AOPT) was received on 7/14/20. Soon after, Dr. Gunderson worked with members of the study team on REDCap survey development. Pilot testing of the REDCap survey and survey optimization began in August after Dr. Chmielewski came back from furlough and continued through October 2020.

B. STUDY RECRUITMENT—October 2020 through May 2022

At the end of October 2020, study recruitment was initiated at 3 clinics located in Wisconsin, Delaware, and Florida through professional contacts of Dr. Gunderson and Dr. Chmielewski. After confirming satisfactory responses, pilot testing was complete. In November of 2020, the survey link was distributed through AOPT email blast and social media distribution. Additionally, the survey link was distributed to within the professional network of the study team.

In January of 2021 Dr. Gunderson and Dr. Chmielewski began working on data management procedures and data analysis algorithms, starting with a subset of the participants, and eventually extending to all participants. In February 2021 it became evident that the REDCap survey link had been hacked by nefarious computer/robot software based on open-ended responses that were verbatim of multiple-choice questions, names of respondents that could not be verified by the FSBPT as licensed and active, and nonsensical email addresses. Hundreds of invalid survey entries were discovered. The survey link was broken while manual inspection of the data was undertaken. A new Captcha was added to the survey link to mitigate future problems. Ultimately, the hacking and breaking of the survey link significantly reduced recruitment during this period as we were unable to re-solicit to previous emails once the link was fixed.

Recruitment re-commenced in April of 2021. An email distribution was sent to the membership of the American Academy of Orthopaedic Manual Physical Therapists (AAOMPT) in April 2021 and members of American Academy of Sports Physical Therapy (AASPT) in May 2021. Over the next 12 months, further recruitment was completed via direct email solicitation through the study team's professional network concurrent with ongoing data management/analysis procedures, initial manuscript writing and 2023 CSM abstract completion. Due to the inclusion criteria of treating 5 or more patients with ACL reconstruction in the past year, the enrollment rate was approximately 50% of those who were recruited. Recruitment closed in May of 2022 with 450/500 participants enrolled for which data analysis has been completed (see Section D).

C. STUDY TEAM MEETINGS

Dr. Gunderson and Dr. Chmielewski maintained twice monthly video meetings in March and April 2020 and again in August 2020 through the end of the funding period to prepare the IRB submission, coordinate and complete survey development, pilot testing, study recruitment, data management and data analysis, results interpretation, and abstract and manuscript preparation.

Drs. Beneciuk, Bialosky, and Russell have provided extensive input and feedback on survey development, recruitment, data analysis algorithms, results interpretation, and abstract preparation. Quarterly updates via email correspondence or video meetings were conducted throughout the funding period.

D. DATA ANALYSIS AND RESULTS

Demographic Characteristics

A total of 450 physical therapists (PTs) (57.6% male) were enrolled. Demographic data are summarized in Table 1. Diversity in geographic region and years of experience was achieved. Nearly half (44.7%) of the sample had residency or fellowship training, 64% were board certified, and over half (52.5%) reported treating >10 patients with ACLR per year.

Table 1. Demographic characteristics of 450 PTs

ACLR/year	2: 5-10	214 (47.6%)
	3: 11-20	106 (23.6%)
	4: 21 ⁺	130 (28.9%)
Region	MW	95 (21.1%)
	NE	88 (19.5%)
	NW	48 (10.6%)
	S	51 (11.3%)
	SW	75 (16.7%)
	SE	90 (20%)
	Missing	3 (0.7%)
Residency or Fellowship		201 (44.7%)
Certification	0: none	160 (35.6%)
	1: OCS	164 (36.4%)
	2: SCS	98 (21.8%)
	3: Both	27 (6%)
	Missing	1 (0.2%)
Gender	1: male	259 (57.6%)
	2: female	190 (42.2%)
	3: other	1 (0.2%)
Years Practicing	1: 0-4	128 (28.4%)
	2: 5-10	132 (29.3%)
	3: 11-15	51 (11.3%)
	4: 16 ⁺	138 (30.7%)
	Missing	1 (0.2%)
PT Degree	1: BSPT	47 (10.4%)
	2: MSPT	73 (16.2%)
	3: DPT	329 (73.1%)
	Missing	1 (0.2%)
Research Degree		45 (10%)

Aim 1: Elucidate PTs' awareness and beliefs about using a psychologically informed practice (PIP) approach to manage fear of re-injury after ACLR.

Most PTs (98%) were aware of at least one assessment or one treatment strategy for fear of re-injury. Clinical intuition was the assessment method of which most were aware (82%) and graded exposure was the treatment method of which most were aware (92%). One third of the sample (33%) were unaware of enhanced patient interview techniques such as motivational interviewing, and less than half (47%) were aware of cognitive-behavioral strategies for treating fear of re-injury. Most of PTs (98%) believe that it is within their scope of practice to both assess and treat fear of re-injury. In addition, 86% of PTs perceive that more than 25% of their patients experience fear of re-injury after ACLR (Figure 1). These findings indicate that PTs recognize the prevalence of fear of re-injury after ACL reconstruction, believe it is within their scope of practice to assess and treat it, and have awareness of some assessment and treatment methods. However, education on enhanced interview techniques and cognitive-behavioral strategies is warranted.

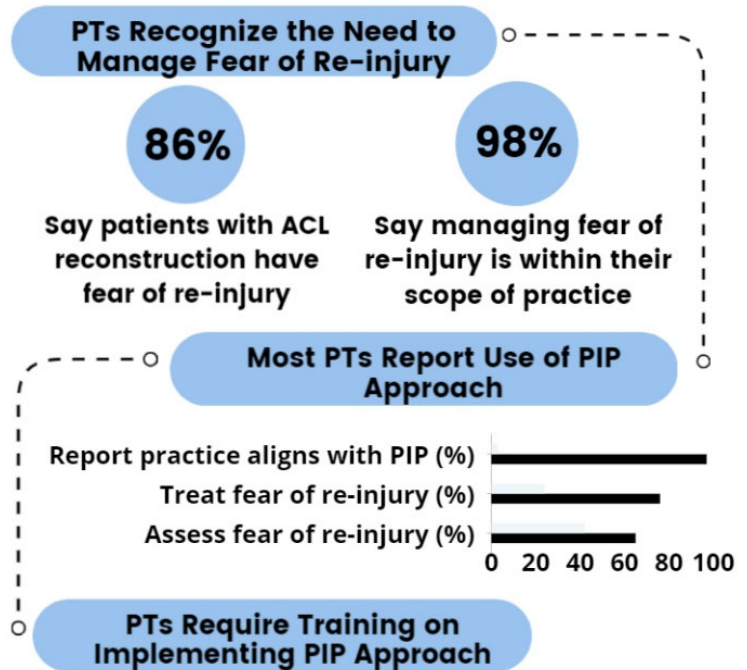


Figure 1. PT Awareness, Beliefs, and Clinical Behaviors about Managing Fear of Re-Injury.

Aim 2: Describe the current clinical behaviors that PTs use to manage fear of re-injury after ACLR in relation to a PIP approach.

The proportion of PTs who reported that their practice aligns or somewhat aligns with the definition of a PIP approach was 63% and 33%, respectively (Figure 1). In the sample, 65% (N=292) indicated that they assess fear of re-injury, and 76% indicated that they treat patients for fear of reinjury after ACLR (Figure 1). Those participants who reported

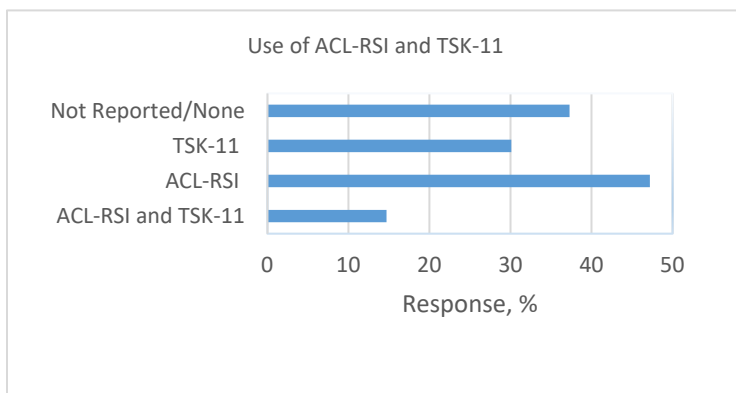


Figure 2. PTs that assess for fear of reinjury who reported using ACL-RSI or TSK-11.

ACL-RSI = ACL Return to Sport after Injury scale
TSK-11 = Tampa Scale of Kinesiophobia (11 question)

assessing were also asked the open-ended question: "What methods do you use to assess for fear of re-injury" Free text responses showed that 47% (N=138) reported using the ACL-RSI, 30% (N=88) reported using the TSK-11, and 37% (N=109) did not report or did not use the ACL-RSI or TSK-11 (Figure 2). With consideration of the entire sample, up to 60% (N=267) are not using the ACL-RSI or TSK-11 (Figure 2). These findings indicate that nearly all PTs report that their practice is at least somewhat aligned with a PIP approach. However, less than two-thirds assess their patients for fear of reinjury, and for those who do assess, a significant proportion are not using questionnaires recommended by clinical practice guidelines. PTs would benefit from education on assessment strategies for fear of re-injury that are in accordance with a PIP approach so that patient status is assessed prior to administration of treatment.

Aim 3: Categorize PTs' readiness to use a PIP approach to manage fear of re-injury after ACL reconstruction.

Categorization was determined by an algorithm developed by the study team which integrates awareness, beliefs, and clinical behaviors related to managing fear of re-injury after ACL reconstruction according to the Transtheoretical model of behavior change (Figure 3). A significant proportion (86-98%) of PTs have positive awareness and beliefs regarding the management of fear of re-injury, and answers to these items were not necessary in the final algorithm for determining

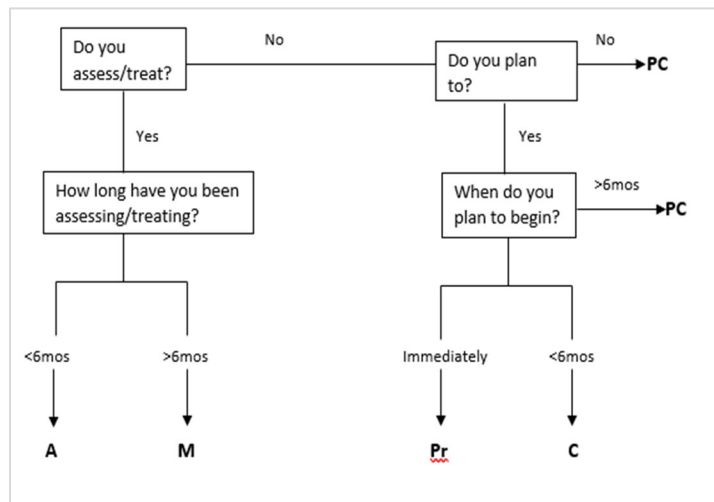


Figure 3. Algorithm for determining stage of change
 PC = Pre-Contemplation
 C = Contemplation
 Pr= Preparation
 A = Action
 M = Maintenance

stage of change. Reported clinical behaviors and timeframes used in the Transtheoretical model were the items that ultimately determined stage of change categorization. The results for assessment show that 12% are in Precontemplation and 15% are in Contemplation, while 62% are in Maintenance stage of change. For treatment, 11% are in Precontemplation and 10% are in Contemplation, while 71% of PTs are in maintenance stage (Figure 4).

Differences in stage of change based on training and board certification were examined with Chi-square test (Figure 5). We found that 71% of PTs with advanced training (residency or fellowship training) were in the Maintenance stage of change for assessment, while only 55% of PTs with no advanced training were in the Maintenance stage. This result was similar for board certification where 68% of those with board certification were in Maintenance stage vs 51% of those without board certification (p<.05). For treatment, 79% of those with advanced training were in Maintenance stage vs 66% without (p<.05). There was no difference for treatment stage of change based on having board certification.

without (p<.05). There was no difference for treatment stage of change based on having board certification.

Based on the categorization results, about 20 to 30% of PTs are likely to be resistant to the use of assessment and treatment methods for fear of reinjury after ACL reconstruction in their clinical practice. These PTs may require targeted training aimed at overcoming barriers to clinical implementation. Conversely, about 60-70% of PTs are utilizing a PIP approach. These PTs would benefit from training on PIP that optimizes clinical implementation. It appears that attaining board certification or being residency/fellowship trained, either through the training itself or personal characteristics of the PT (e.g., motivation for clinical excellence) is helpful for adopting in a PIP approach.

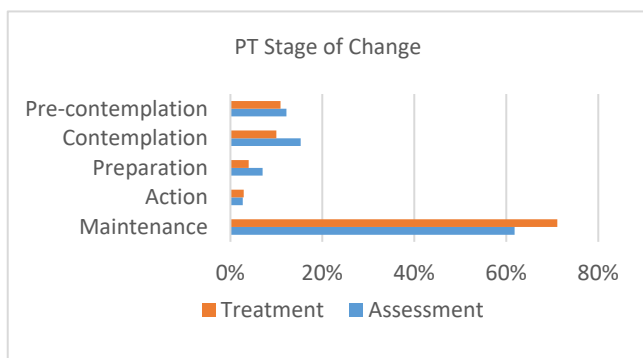


Figure 4. Categorization of readiness for managing fear of re-injury after ACL reconstruction
 Pre-contemplation = Not changing behavior
 Contemplation = Considering change <6 months
 Preparation = Taking steps towards change
 Action = Changed behavior < 6 months ago
 Maintenance = Changed behavior > 6 months ago

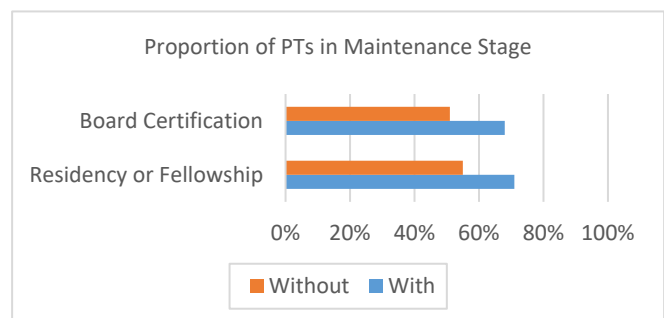


Figure 5. Proportion in the Maintenance stage for assessing fear of reinjury based on advanced training status.
 Board Certification = OCS and/or SCS
 Maintenance = Changed behavior > 6 months ago

2. Provide a one-paragraph summary of results or abstract suitable for posting on the Academy website

ABSTRACT

Purpose/Hypothesis: Fear of reinjury deters return to sport after anterior cruciate ligament reconstruction (ACLR). It is unclear if physical therapists (PTs) are prepared to assess and treat (manage) fear of reinjury to possibly improve the return to sport rate. The purpose of the study was: 1) describe awareness, beliefs, and clinical behaviors of PTs in managing fear of reinjury after ACLR 2) categorize PTs' stage of change for managing fear of re-injury, and 3) examine stage of change based on advanced clinical training (residency/fellowship) or board certification (OCS/SCS). We hypothesized that PTs would have limited awareness, and negative beliefs and clinical behaviors, for managing fear of reinjury after ACLR, especially in those without advanced clinical training or board certification. **Subjects:** 450 PTs (45% with advanced clinical training, 64% with board certification) in the United States who reported treating ≥ 5 patients with ACLR in the past year. **Materials and Methods:** An online survey based on the Transtheoretical Model of behavior change was distributed to PTs via social media and email solicitation between November 2020 and May 2022. Responses to items about awareness, beliefs, and clinical behaviors of potential methods for assessment (e.g., interview or standardized questionnaires) or treatment (e.g., psychophysical or cognitive behavioral) of fear of re-injury were described. Responses were then used to categorize PTs into five stages of change (Precontemplation, Contemplation, Preparation, Action, Maintenance). Differences in stage of change based on advanced clinical training or board certification (yes or no) were determined with Chi-square test. **Results:** Over 98% of PTs were aware of at least 1 assessment or treatment strategy for fear of re-injury, but only 47% were aware of cognitive-behavioral strategies. Most believed fear of reinjury is prevalent after ACLR (86%) and management is within practice scope (98%). PTs reported assessing (65%) and treating (76%) for fear of reinjury. The proportion in Precontemplation and Contemplation stages for assessment of fear of re-injury was 12% and 15%, respectively, and for treatment was 11% and 10%, respectively. A greater proportion of PTs with advanced clinical training (71% vs 55%) or board certification (68% vs 51%) were in Maintenance stage for assessment, and a greater proportion of those with advanced clinical training (79% vs 66%) were in Maintenance stage for treatment ($p's < 0.05$). **Conclusions:** PTs are mostly aware of potential management methods for fear of re-injury after ACLR except for cognitive-behavioral strategies. PTs have positive beliefs and clinical behaviors for managing fear of reinjury after ACLR. About 20 to 30% of PTs are likely to resist managing fear of reinjury, and advanced practice promotes sustained clinical behavior change. **Clinical Relevance:** PTs, especially those without advanced clinical training, need methods to implement management of fear of reinjury after ACLR. Education on cognitive-behavioral strategies for fear of re-injury is required.

3. Attach a list of your publications published or accepted during the past year, or currently being written. Send reprints when available. List presentations made and abstracts accepted for presentation based on this work. Indicate with an asterisk (*) those publications supported by Academy of Orthopaedic Physical Therapy funding.

Abstracts

Gunderson TC, Beneciuk JM, Bialosky JE, Russel H, Chmielewski TL. Physical Therapists' Readiness to Manage Fear of Reinjury after Anterior Cruciate Ligament Reconstruction. Submitted for platform presentation at the 2023 APTA Combined Sections Meeting, San Diego, CA.

The target journal for the primary results of this study is Journal of Orthopaedic and Sports Physical Therapy

4. Provide a budget, using the original approved budget. Indicate total funds spent to date per major categories. If there was > 25% deviation (greater or less spent) of use of funds for any of the budget category, please BRIEFLY indicate the rationale.



RESEARCH STUDY BUDGET REPORT

STUDY INFORMATION

Study Title: Physical Therapists' Readiness for Change in the Management of Fear of Re-Injury after ACL Reconstruction
Principal Investigator: Travis Gunderson, PT

A. Study Personnel

Name	Role	Effort	Paid	In-Kind
Travis Gunderson, PT	Principal Investigator	5.00%	x	
Terri Chmielewski, PT	Primary Mentor	5.00%		x
Jeanette Zeigenfuss		20 hours		x
Hayley Russell	Mentor	20 hours		x
Jason Benueciuk	Mentor	20 hours		x
Joel Bialosky	Mentor	20 hours		x
Michael Obermeier, AT	Study Coordinator	5.00%	x	
Megan Reams	Project Manager	50 hours		x

B. Year 1 Budget Report

Category	Year 1 Budgeted	Year 1 Actual	Year 1 Differential
Personnel Budget			
Travis Gunderson	\$9,738.00	\$9,195.63	\$542.37
Research Coordinator			
Materials & Supplies			
APTA Ortho Section Email Blast	\$200.00	\$300.00	(\$100.00)
AASPT Email Blast	\$0.00	\$250.00	(\$250.00)
Postage (stipends)	\$275.00	\$0.00	\$275.00
Consultant Costs			
REDCap database development	\$4,000.00	\$1,804.16	\$2,195.84
Equipment			
	\$0.00	\$0.00	\$0.00
Stipends¹			
Stipends	\$5,000.00	\$3,810.00	\$1,190.00
Total direct costs	\$19,213.00	\$15,359.79	\$3,853.21
Total indirect costs	---	---	---
Total costs	\$19,213.00	\$15,359.79	\$3,853.21

¹ these funds have been accrued in year 1 and will be paid out early in year 2. This delay is due to the issue identified in the study report and the desire to batch this work.

C. Year 2 Budget Report

Category	Year 2 Budget	Year 2 Actual	Year 2 Differential
Personnel Budget			
Travis Gunderson	\$4,285.00	\$6,217.25	(\$1,932.25)
Research Coordinator			
Materials & Supplies			
APTA Ortho Section Email Blast	\$0.00	\$0.00	\$0.00
AASPT Email Blast	\$0.00	\$0.00	\$0.00
Postage (stipends)	\$0.00	\$0.00	\$0.00
Consultant Costs			
REDCap database development	\$0.00	\$0.00	\$0.00
Equipment			
	\$0.00	\$0.00	\$0.00
Stipends			
Stipends	\$0.00	\$0.00	\$0.00
Total direct costs	\$4,285.00	\$6,217.25	(\$1,932.25)
Total indirect costs	---	---	---
Total costs	\$4,285.00	\$6,217.25	(\$1,932.25)

- Personnel was over budget due to survey link hack and manual data inspection.
- AOPT email blast was over budget and AASPT email blast added to increase recruitment.
- All stipends were sent out electronically, no postage was required.
- Our database development came in significantly under budget.
- Stipends under budget secondary to participants declining payment and not recruiting to our N.

5. Budget: please send out a final print-out from your institution indicating monies per major categories.

D. Overall Budget Report

Category	Total Budget	Total Spent	Total Remaining
Personnel Budget			
Travis Gunderson	\$14,023.00	\$15,412.88	(\$1,389.88)
Research Coordinator			
Materials & Supplies			
APTA Ortho Section Email Blast	\$200.00	\$300.00	(\$100.00)
AASPT Email Blast	\$0.00	\$250.00	(\$250.00)
Postage (stipends)	\$275.00	\$0.00	\$275.00
Consultant Costs			
REDCap database development	\$4,000.00	\$1,804.16	\$2,195.84
Equipment			
	\$0.00	\$0.00	\$0.00
Stipends			
Stipends	\$5,000.00	\$3,810.00	\$1,190.00
Total direct costs	\$23,498.00	\$21,577.04	\$1,920.96
Total indirect costs	---	---	---
Total costs	\$23,498.00	\$21,577.04	\$1,920.96