

5-2022

Survey of Confidence and Knowledge to Manage Patellofemoral Pain in Readers Versus NonReaders of the Physical Therapy Clinical Practice Guideline

Richard W. Willy
University of Montana

Lisa T. Hoglund
Thomas Jefferson University

Neal R. Glaviano
University of Connecticut

Lori A. Bolgla
Augusta University

David M. Bazett-Jones
Follow this and additional works at: <https://jdc.jefferson.edu/ptfp>
University of Toledo



Part of the [Physical Therapy Commons](#)

[Let us know how access to this document benefits you](#)

Recommended Citation

Willy, Richard W.; Hoglund, Lisa T.; Glaviano, Neal R.; Bolgla, Lori A.; and Bazett-Jones, David M., "Survey of Confidence and Knowledge to Manage Patellofemoral Pain in Readers Versus NonReaders of the Physical Therapy Clinical Practice Guideline" (2022). *Department of Physical Therapy Faculty Papers*. Paper 29.
<https://jdc.jefferson.edu/ptfp/29>

This Article is brought to you for free and open access by the Jefferson Digital Commons. The Jefferson Digital Commons is a service of Thomas Jefferson University's [Center for Teaching and Learning \(CTL\)](#). The Commons is a showcase for Jefferson books and journals, peer-reviewed scholarly publications, unique historical collections from the University archives, and teaching tools. The Jefferson Digital Commons allows researchers and interested readers anywhere in the world to learn about and keep up to date with Jefferson scholarship. This article has been accepted for inclusion in Department of Physical Therapy Faculty Papers by an authorized administrator of the Jefferson Digital Commons. For more information, please contact: JeffersonDigitalCommons@jefferson.edu.

Survey of Confidence and Knowledge to Manage Patellofemoral Pain in Readers Versus NonReaders of the Physical Therapy Clinical Practice Guideline

Richard W. Willy PT, PhD¹; Lisa T. Hoglund, PT, PhD²; Neal R. Glaviano, PhD, ATC³; Lori A. Bolgla, PT, PhD, MAcc, ATC⁴; David M. Bazett-Jones, PhD, ATC, CSCS⁵

¹University of Montana, School of Physical Therapy and Rehabilitation Sciences, Missoula, MT, USA

²Thomas Jefferson University Jefferson College of Rehabilitation Sciences, Department of Physical Therapy, Philadelphia, PA, USA

³Department of Kinesiology, University of Connecticut, Storrs, CT

⁴Department of Physical Therapy in the College of Allied Health Sciences and the Department of Orthopaedic Surgery at the Medical College of Georgia, Augusta University, Augusta, GA, USA

⁵School of Exercise and Rehabilitation Sciences, University of Toledo, Toledo, OH, USA

Declaration of Interest Statement: The authors have no conflicts of interest, including financial or endorsement relationships, to declare.

Ethical Approval: Ethical Approval via the University of Toledo Human Subjects Research Board was obtained prior to the initiation of data collection.

Corresponding Author

Richard W. Willy, PT, PhD
Associate Professor
32 Campus Drive
School of Physical Therapy and Rehabilitation Science
Missoula, MT, USA 59812

Survey of Confidence and Knowledge to Manage Patellofemoral Pain in Readers Versus NonReaders of the Physical Therapy Clinical Practice Guideline

Declaration of Interest Statement: The authors have no conflicts of interest, including financial or endorsement relationships, to declare.

Ethical Approval: Ethical Approval via the XXX Institutional Research Board was obtained prior to the initiation of data collection.

Survey of Confidence and Knowledge to Manage Patellofemoral Pain in Readers Versus NonReaders of the Physical Therapy Clinical Practice Guideline

ABSTRACT

Objectives: To compare beliefs of physical therapists (PTs) who read the clinical practice guideline (CPG) for the management of individuals with patellofemoral pain (PFP) to those who have not read the CPG.

Design: Cross-sectional study.

Setting: Online survey.

Participants: 494 currently licensed/registered PTs or physiotherapists.

Main outcome measures: Respondents answered Likert-based or open-ended questions regarding the diagnosis, prognosis, risk factors, and management of individuals with PFP, as well as confidence for managing individuals with PFP, especially the ability to identify beneficial and non-beneficial interventions. We dichotomized responses into participants who read (READERS) and did not read (NonREADERS) the CPG.

Results: Most respondents held inaccurate beliefs about risk factors and prognosis; however, READERS' beliefs better aligned with the CPG than NonREADERS ($P<0.01$). Most respondents correctly agreed that hip and knee exercise was the recommended treatment strategy; yet NonREADERS believed in implementing unsupported passive treatments ($P<0.01$). READERS reported greater confidence in managing individuals with PFP, delivering evidence-based interventions, identifying less beneficial treatments, and locating evidence-based resources than NonREADERS ($P<0.01$).

Conclusion: While READERS and NonREADERS held accurate beliefs for exercise-based treatment for PFP, greater knowledge translation is needed to counter inaccurate beliefs regarding risk factors, prognostic factors, and passive treatments.

Keywords: knowledge translation; rehabilitation; anterior knee pain; knee

HIGHLIGHTS

- READERS' beliefs more likely to be consistent with the clinical practice guideline.
- Incorrect beliefs persist for risk factors and prognosis for patellofemoral pain.
- Clinicians correctly identified exercise therapy as important for management.
- NonREADERS were more likely to believe that passive adjuncts were helpful.
- Additional educational platforms may increase clinician knowledge on best practice.

INTRODUCTION

Unwarranted variation in practice patterns is a key driver of lower value care, resulting in higher healthcare costs and poorer patient outcomes (Atsma, Elwyn, & Westert, 2020). Importantly, differing patient presentations or patient preferences cannot solely explain practice pattern variation (Wennberg, 2002). While reimbursement patterns may play a role, most practice variation results from clinician beliefs regarding treatment efficacy (Cutler, Skinner, Stern, & Wennberg, 2019). In an effort to limit unwanted practice variation, clinical practice guidelines (CPGs) provide evidence-based recommendations for patient care (Becker, Strunk, Buschhaus, Buhn, & Pieper, 2020). CPGs should assist, not replace, clinical decision-making by providing evidence-based recommendations regarding risk factor identification, examination, assessment, and interventions for specific conditions (Wallis, Roddy, Bottrell, Parslow, & Taylor, 2021). The goal of CPGs is to provide clear guidance for enhancing high-quality patient care and reducing

utilization of low-value care, thus resulting in translation of evidence to improve quality of care (Saini, Brownlee, Elshaug, Glasziou, & Heath, 2017).

One of the most common musculoskeletal conditions is patellofemoral pain (PFP). PFP is characterized by an insidious onset of peri- or retro-patellar pain (Callaghan & Selfe, 2007) and exercise therapy is considered the standard of care for the management of individuals with PFP (R. W. Willy, et al., 2019). PFP is associated with a high rate of recurrence, with nearly 79% of individuals reporting recurrent symptom and functional limitations 4 years after initial diagnosis (Blond & Hansen, 1998). A 2016 survey found a high degree of practice variability among physiotherapists in the United Kingdom when treating individuals with PFP (Smith, et al., 2017). For instance, 31% of surveyed physiotherapists reported advising patients to cease exercise if they experience any PFP (Smith, et al., 2017), even though pain during exercise does not adversely affect patient outcomes (Thomeé, 1997). High practice variability may contribute to the aforementioned high PFP recurrence rate (Blond & Hansen, 1998).

In 2019, the Academy of Orthopaedic Physical Therapy (AOPT) of the American Physical Therapy Association published a CPG for the management of individuals with PFP (identified henceforth as the CPG) (R. W. Willy, et al., 2019). This CPG was rated “high-quality” via the AGREE II in a recent assessment of available PFP CPGs (Wallis, et al., 2021). The CPG is an open access publication, with >170,000 downloads since publication (access date: 28 October, 2021). The CPG recommendations were disseminated to clinicians and patients via podcasts; (“JOSPTasks,” 2020) press releases; infographics; (“Patellofemoral pain: Often known as “kneecap pain” or “runner’s knee,” 2019) published patient (“Patellofemoral Pain: Treating Painful Kneecaps,” 2019)

and clinician perspectives;("Patellofemoral Pain: Using the Evidence to Guide Physical Therapist Practice," 2019) and clinician-targeted conference educational sessions (R. Willy, Bolgla, Hoglund, Logerstedt, & McDonough, 2021).

Barriers to implementation of CPGs are examined by using the knowledge, attitudes, and behavior framework (Woolf, 1993). Briefly, CPGs must first inform a clinician's knowledge, followed by affecting a clinician's attitudes and then ultimately, a clinician's behaviors (e.g., practice patterns) (Cabana, et al., 1999). Thus, assessing clinicians' knowledge of the recommendations in the CPG is an important first step to determine barriers to the later steps of affecting clinicians' attitudes and clinical practice patterns. Surveys are best suited to understand clinicians' beliefs so that knowledge gaps can be identified (Cabana, et al., 1999). Comparing the beliefs of clinicians who read the CPG with those who did not read the CPG can provide insight into knowledge gaps so that better knowledge dissemination strategies can be devised.

This survey-based study sought to determine if physical therapists (PTs) who read the CPG (R. W. Willy, et al., 2019) held beliefs that more accurately aligned with the CPG recommended practices compared to clinicians who had not read the CPG. We hypothesized that PTs who read the CPG would more frequently report beliefs similar to those supported by the CPG than those who did not. Understanding current PT knowledge on the management of PFP can help guide future revisions of the CPG and inform knowledge translation efforts if gaps in PT knowledge are identified.

METHODS

This study was a cross-sectional survey conducted according to the Checklist for Reporting Results of Internet E-Surveys guideline recommendations (Eysenbach, 2004). Recruitment for this study was conducted electronically via email and multiple social media platforms. A link to the online open survey (Qualtrics^{®XM}, Provo, UT) was also sent to the AOPT email listserv and advertised on its social media platforms on January 18, 2021. Data collection for this survey ended on February 15, 2021. The online consent process informed participants of the study purpose, approximate time to complete the survey, storage of identifying data, and researcher contact information. Timestamps and cookies were not used in this study. Only currently practicing PTs participated. Duplicate entries from the same IP address were removed. Subjects received no incentives for participating. This study was approved by the XXX Institutional Review Board.

Survey Instrument

An 80-question, 12-page online survey was used to assess PTs' confidence and knowledge of the diagnosis, prognosis, risk factors, and management of individuals with PFP. Questions were developed based on the recommendations of the current CPG. Survey structure was based on a survey by Zambarano et al. (Zambarano, Bazett-Jones, de Oliveira Silva, Barton, & Glaviano, 2021) that evaluated athletic trainer confidence and knowledge regarding the diagnosis, prognosis, risk factors, and management of individuals with PFP and was also based on the mixed methods investigation by Barton et al. (Barton, et al., 2021). Please refer to Zambarano et al. for full details on the foundational development of this survey (Zambarano, et al., 2021). Survey question formats included Likert-based and open-ended questions. The survey

was divided into four sections: 1) participant demographics, 2) confidence in management of PFP; 3) knowledge of risk factors, examination and prognostic factors, for individuals with PFP; and, 4) knowledge of current management strategies.

Participant Demographics

Participants self-identified their gender, race, ethnicity, highest education level, years licensed/registered, occupation setting, and country of PT practice. Additional questions included: personal experience of PFP, professional experience of managing PFP, and current frequency of treating patients with PFP (cases per year). Question response options included yes/no and free text. Free text responses for cases per year were converted to categories of 0-5, 6-15, 16-25, and more than 26 cases of PFP treated per year. Respondents self-identified whether they had read the CPG and were subsequently categorized as CPG readers (READERS) and non-readers (NonREADERS).

Confidence in Management of PFP

Participants rated their confidence in the management of PFP regarding diagnosis, prognosis, evidence for perceived beneficial and non-beneficial interventions, knowledge of risk factors, and appropriateness of general web site PFP information (n=7). These were scored with 5-item Likert scales (strongly agree, agree, neither agree nor disagree, disagree, strongly disagree).

Knowledge of PFP Risk Factors, Diagnosis, Prognosis, & Management

Questions included in this study regarding knowledge of PFP were divided into four subcategories: diagnosis (n=3), risk factors (n=12), prognosis (n=5), and management (n=16 [exercise-related n=7; other treatments n=9]). Subcategory questions consisted of

Likert scale questions (strongly agree, agree, neither agree nor disagree, disagree, strongly disagree).

Statistical Analysis

Data were exported from Qualtrics^{®XM} to Excel for data analysis and incomplete surveys removed. Means, standard deviations, frequencies, and/or percentages were computed for all questions. Using SPSS (version 25, IBM SPSS Statistics, Armonk, NY, USA), a chi-squared test was used to compare responses between READERS and NonREADERS. To protect against a type I error from multiple analyses, we selected a more conservative alpha *a priori* at $P < 0.01$. Based on 265,000 physical therapists in the US, we needed 267 and 384 participants for continuous data and categorical data, respectfully, to reach 95% confidence with adequate power for a survey study (Adam, 2021). STROBE Reporting Guidelines were used during the manuscript preparation process.

RESULTS

The survey was initiated (clicked link) by 653 individuals; 618 volunteers consented to participate. Fourteen individuals were excluded because they were not currently licensed/registered PTs or physiotherapists. Of the 604 participants who consented and qualified for this study, 494 participants completed the survey (82% completion rate). Of the total participants, 48.8% and 51.2% were classified as READERS and NonREADERS, respectively. Group and overall demographics are included in **TABLE 1** and **SUPPLEMENTARY TABLE**.

Confidence in Management of PFP

READERS reported greater confidence (i.e., more indicating strongly agree) accurately diagnosing ($P<0.001$) and identifying PFP risk factors ($P<0.001$) compared with NonREADERS. They also had greater confidence using best evidence to manage patients with PFP ($P<0.001$), deliver evidence-based treatments ($P<0.001$), identify less beneficial treatments ($P<0.001$), and locate evidence-based information to provide to patients with PFP ($P<0.001$) compared with NonREADERS. **FIGURE 1** summarizes these findings.

Knowledge of PFP Risk Factors, Diagnosis, & Prognosis

All PTs, regardless of CPG reading status, strongly agreed or agreed ($>75\%$) that the following represent risk factors for PFP onset: female sex; quadriceps weakness; gluteus medius weakness; and dynamic knee valgus during activities (**FIGURE 2**). NonREADERS strongly agreed or agreed that an increased Q-angle (75%) and increased foot pronation (79%) were risk factors whereas only 54% and 61% of READERS strongly agreed or agreed that the Q-angle ($P<0.001$) and foot pronation ($P=0.004$) were risk factors, respectively. Fewer READERS (38%; $P<0.001$) strongly agreed or agreed that delayed vastus medialis oblique:vastus lateralis muscle onset is a risk factor compared to NonREADERS (62%). No other significant differences were identified ($P=0.027$ -0.863).

Knowledge of PFP diagnosis was significantly different between the groups (**FIGURE 3**). Significantly more READERS versus NonREADERS strongly agreed with the statement regarding the most important criterion required to diagnose PFP was reproduction of retro- or peri-patellar pain with resisted knee testing ($P=0.008$). No

differences existed between READERS and NonREADERS for the utility of the patellar grinding tests ($P=0.011$) or the presence of psychological factors ($P=0.046$).

Knowledge of PFP prognosis differed between READERS and NonREADERS (**FIGURE 3**). More READERS strongly agreed with the statement of unfavorable recovery 5-8 years after treatment ($P<0.001$). No other significant differences were noted ($P=0.198-0.387$).

Knowledge of PFP Management

Regardless of CPG reading status, over 90% of respondents strongly agreed or agreed that exercise-based therapy is effective and education is vital for managing individuals with PFP with no difference ($P=0.293-0.645$) between groups. READERS and NonREADERS did not differ ($P=0.11-0.67$) in appropriateness of using taping and/or bracing for short-term pain relief; activity modification; and the combined use of exercise therapy with two or more adjunct interventions (e.g., taping, bracing, foot orthoses, or manual therapy). Although over 75% of respondents strongly agreed or agreed not to use stand-alone manual therapy, a lower proportion of NonREADERS reported strong agreement with this statement than READERS ($P=0.006$). Most respondents ($\geq 70\%$) strongly agreed or agreed with using foot orthoses, but more READERS strongly agreed with this item than NonREADERS ($P=0.002$). Nearly half of NonREADERS strongly agreed or agreed that dry needling, therapeutic ultrasound, and electrophysical agents can be used to reduce pain associated with PFP and the proportions of NonREADERS who held these beliefs were greater (all $p<0.001$) than READERS.

DISCUSSION

We examined if READERS more accurately identified best practices for the management of PFP compared with NonREADERS. Self-reported confidence in the accuracy of practice beliefs was high in READERS and NonREADERS. Clinicians in both groups accurately identified exercise therapy, specifically hip and knee exercise therapy, as the recommended intervention for individuals with PFP. Otherwise, we found multiple and important instances of considerable discordance between PTs' beliefs and CPG recommendations. Notably, knowledge of established risk factors, prognosis, and the use of passive treatments for PFP across all respondents were often inconsistent with CPG recommendations. Compared with NonREADERS, READERS were more likely to strongly agree or agree with the CPG's recommendations against the use of several passive treatments (e.g., dry needling and electrophysical agents). These findings are clinically important because they identify knowledge gaps with respect to risk factors, prognosis, and the use of passive treatments. Overall, these findings suggest that READERS have knowledge and beliefs that are more consistent with the recommendations of the CPG. Future work should determine if clinical outcomes and healthcare utilization differs between READERS and NonREADERS.

Risk factors, prognosis, and examination

We found considerable discordance between PTs' beliefs and the CPG regarding PFP risk factors. Contrary to respondents' beliefs, the CPG did not identify increased Q-angle, hip weakness, greater body mass/body mass index, and increased foot pronation as risk factors. For instance, 87% of respondents, regardless of reader-status, incorrectly strongly agreed/agreed that increased dynamic knee valgus was a risk factor for PFP. Knowledge gaps on risk factors may have important clinical implications. Evidence for

implementing prevention programs based on these non-risk factors for PFP lack evidence. Hip strengthening to reduce risk of PFP (Brushoj, et al., 2008), prescribing foot orthoses based on foot-type to reduce risk of PFP, or incorrectly identifying healthy individuals with high Q-angles as being at “high risk” for PFP onset lack evidence (Lankhorst, Bierma-Zeinstra, & van Middelkoop, 2012; Neal, et al., 2019). Similarly, 88% of respondents incorrectly strongly agreed/agreed that higher body mass/body mass index was a risk factor for PFP onset (Hart, Barton, Khan, Riel, & Crossley, 2017). Based on this incorrect belief, clinicians may wrongly discourage individuals with a higher body mass/body mass index from initiating an exercise program. Despite the incongruence of clinician’s beliefs and the CPG recommendations, over 80% of all clinicians, regardless of reading status, were confident/highly confident of their knowledge of risk factors for PFP onset. This finding of high confidence in risk factor beliefs strongly suggests the need for additional education of clinicians on PFP risk factors.

Prognosis represented another area with disagreement between clinicians’ beliefs and CPG information. Only 32.8-34.0% disagreed with the statement that “Adolescents with PFP tend to grow out of this pathology.” In fact, 75-79% of adults with PFP have reported persistent pain 1.0-5.7 years after diagnosis (Blond & Hansen, 1998; van Middelkoop, van der Heijden, & Bierma-Zeinstra, 2017) and 55.9% of adolescents with PFP have reported continued knee pain 2 years after initial diagnosis (Rathleff, Rathleff, Olesen, Rasmussen, & Roos, 2016). Only 55% of respondents strongly disagreed/disagreed with the statement that “PFP is self-limiting, and pain goes away with time with no treatment.” Clinicians who believe that PFP is self-limiting, particularly in adolescents, may delay the initiation of appropriate management. Since a patient’s

prognosis appears closely tied to the duration of their PFP symptoms, delays in receiving appropriate management for PFP may contribute to poorer patient prognosis (Matthews, et al., 2017; Young, Snodgrass, Cleland, & Rhon, 2021a).

Several possible explanations may explain the disagreement between PT's beliefs and the CPG with respect to risk factors and prognostic factors. First, CPGs only grade the evidence on risk factors and prognostic factors, rather than providing clear recommendation grades as is done in other categories, such as treatment. Second, the knowledge translation efforts that accompanied the CPG publication (e.g., podcasts, AOPT press release) focused more on treatment recommendations. CPG reader status was not a strong differentiator between respondents who accurately identified risk factors and understood prognosis for those with PFP. This finding may be because the initial pages of the CPG are summarized recommendations except for risk factors and prognosis. Future work should determine how much of the CPG the READERS actually read.

These findings suggested that clinicians may have longstanding inaccurate beliefs regarding risk factors and prognostic factors that may require more intensive education efforts to overcome. Broad but comprehensive dissemination methods provided consistently to clinicians are key to implementation of a CPG since behavior change within the healthcare system is challenging. Usual practices or beliefs may need to be discarded by healthcare providers to be consistent with a CPG (Kredo, et al., 2016). Changing the beliefs of healthcare providers is challenging because it requires unlearning previous held beliefs. The process of unlearning is more challenging than acquiring new knowledge because it requires acknowledging and the release of prior assumptions

(Kitson & Straus, 2010). Our results indicated knowledge translation efforts of the CPG and its future revisions should focus equally on risk factors, prognosis, examination, and treatment, rather than emphasizing treatment. Since substantial knowledge gaps were identified for the risk factors and prognosis associated with PFP, standalone knowledge translation materials may be warranted to improve clinicians' knowledge in these areas.

Compared with risk factors and prognostic factors, responses were more consistent with the CPG with respect to diagnosis. The overwhelming majority of respondents (>89%) correctly rated retropatellar or peripatellar pain aggravated by loading the patellofemoral joint as the most important diagnostic criterion, though READERS strongly agreed with this more than NonREADERS. This finding was consistent with the CPG recommendation to use reproduction of peripatellar/retropatellar pain during squatting or other functional activities requiring weight-bearing on a flexed knee as diagnostic tests for PFP (grade "A" level evidence) (R. W. Willy, et al., 2019). A majority of respondents, regardless of CPG readership status, correctly strongly disagreed/disagreed that patellar grind/Clarke test was essential to diagnose individuals with PFP. Most survey respondents (92%) strongly agreed/agreed that individuals with PFP may exhibit psychosocial factors such as pain catastrophizing and anxiety. While our finding on psychosocial factors is consistent with current evidence, it is unknown if PTs see the need for referral to another healthcare practitioner e.g., psychologist, as the CPG recommends for positive findings during yellow flag screening during examination of individuals with PFP.

Management of individuals with PFP

Clinicians' beliefs on the use of exercise therapy in treating individuals with PFP were highly consistent with CPG recommendations, regardless of reader status. Over 90% of respondents indicated that exercise therapy was recommended in the short-, medium-, and long-term to improve pain and function. Agreement with CPG recommendations may not necessarily translate to clinical practice. For instance, only 17.3% of 12,878 active-duty service members with PFP, in a recent retrospective analysis of electronic medical records and insurance payer claims, received exercise therapy during PT sessions (Young, Snodgrass, Cleland, & Rhon, 2021b). Over 95% of respondents, regardless of CPG reader status, also correctly indicated that combined hip and knee exercise therapy was more helpful than knee exercise alone for improved pain and function. The CPG graded general exercise therapy and hip plus knee exercise therapy with "A" level recommendations, meaning that clinicians "should prescribe" these interventions for individuals with PFP. Nearly all respondents (96.2%) agreed with the CPG that training load management was an important management component.

READERS' responses aligned better than NonREADERS on several of the CPG's recommendations for adjunctive therapies. A greater proportion of NonREADERS incorrectly believed that passive treatments (e.g., manual therapy in isolation, dry needling, ultrasound, and electrophysical agents) were appropriate treatments for individuals with PFP. Time spent applying non-effective adjunctive therapies may reduce time spent on effective therapies, such as hip and knee exercise therapy, potentially prolonging recovery in individuals with PFP. Furthermore, a lower proportion of NonREADERS compared with READERS strongly agreed/agreed with foot orthoses as an appropriate adjunctive treatment. Importantly, the use of foot orthoses was previously

associated with a faster recovery from PFP when coupled with exercise therapy in a large, high quality, Level I study compared with exercise therapy alone (N. Collins, et al., 2008). A reluctance by clinicians to prescribe foot orthoses may result in a slower recovery in individuals with PFP.

The overwhelming majority of respondents strongly agreed/agreed that patient education was a vital component in the management of individuals with PFP but no differences existed between READERS and NonREADERS. Despite the respondents' confidence that patient education was an essential component, the CPG gave patient education an "F" (supported by expert opinion) recommendation due to a lack of supporting evidence. A more recent systematic review concurred, finding that patient education lacked high quality Level I and Level II evidence while noting existing evidence supporting patient education was of "low credibility at best" (Silva, Pazzinatto, et al., 2020). High quality trials are needed to better determine the efficacy of patient education and the most beneficial mode of patient education delivery (tailored patient education vs. uniform patient education). Clinicians and patients may benefit from readily available, evidence-based patient education materials; simply directing individuals with PFP to web-based patient education sites may not be appropriate or adequate since unsupported guidance on PFP management is common online. (Silva, Rathleff, et al., 2020) However, more than 1/3rd of our respondents strongly agreed/agreed that appropriate information on PFP management can be found online.

The knowledge gaps identified by this investigation with the CPG recommendations and available evidence may result in a greater utilization of low value care (Hanney, Masaracchio, Liu, & Kolber, 2016). In 1994, PTs reported that their

colleagues were the most frequent source of new clinical knowledge, with little reliance on peer-reviewed literature (Hall, 1995). By 2010, PTs identified peer-reviewed literature as the most frequently utilized source to access current research (Fell, Burnham, & Dockery, 2013). While greater reliance on peer-reviewed literature over the past two decades is promising, over half of all clinicians cite a lack of time as the most common barrier faced to stay abreast of evidence-based practice (Paci, Faedda, Ugolini, & Pellicciari, 2021). While the CPG publication included several knowledge translation efforts (e.g., podcasts and infographics), its 95-page length may preclude many clinicians from reading the CPG in its entirety. The CPG Future work should determine more effective and efficient knowledge translation strategies to ensure greater adoption of CPG recommendations.

When considering the respondents to our survey, the age, race/ethnicity, and gender of our sample were consistent with current demographic data from the APTA (Association, 2020). Please note that the APTA only provides binary gender data. Nearly half of our sample (48.8%) were READERS. However, it is noteworthy that the proportion of PTs in the general population who read CPGs is unknown. We recruited our sample via mass electronic mailings (the AOPT membership listserv) and social media posts (Twitter) from accounts that are physical therapy-focused. Our sample may routinely engage in dialogues more frequently on the contemporary care of individuals with PFP compared to the general population of PTs, many who are not AOPT members or active users of PT social media. Therefore, we do not know if our sample's rate of readership represented the general PT population.

There are some important differences between READERS and NonREADERS that may have affected the results. READERS were more likely to have an advanced certification (e.g., board-certified specialist in orthopaedic physical therapy or board-certified specialist in sports physical therapy and reported treating more individuals with PFP. READERS were also likely readers of other important publications on the care of individuals with PFP, such as the recent consensus statements of the bi-annual International Patellofemoral Pain Retreats (N. J. Collins, et al., 2018; Crossley, et al., 2016). Differences in the literature may have influenced respondents' answers. For instance, the CPG concluded that female sex was a risk factor for PFP whereas a recent high quality systematic review and meta-analysis (Neal, et al., 2019) concluded that sex was not a significant risk factor for PFP. Therefore, it is important to note that answers to survey questions may have been influenced by other relevant readings. While other publications of similar high quality exist, we chose to use the CPG for this survey study because CPGs have specific grades of recommendations that are commonly used to inform policy and physical therapy reimbursement. In addition, the AOPT used dissemination strategies, such as press releases and emailing the CPG to its membership, to encourage adoption of the CPG. For these reasons, the use of the PFP CPG was the appropriate document to use to inform this investigation.

We conducted the survey 17 months after release of the CPG, which continues to be a free, open access publication (R. W. Willy, et al., 2019). Prior to the survey, the CPG was widely discussed on social media and other outlets, with an Altmetric score of 779 (Accessed January 22nd, 2021). This finding placed the CPG in the top 5% of all research outputs scored by Altmetric and the top research output at that time for the *Journal of*

Orthopaedic and Sports Physical Therapy. Minimal barriers existed for clinicians to access the CPG and its recommendations prior to the start of the survey.

This study has several limitations. First, we measured practitioner beliefs, which might not align with actual practice patterns. Surveys on clinical practice patterns have known limitations. Namely, surveys can identify needs for further education to improve knowledge but may not accurately reflect practice (Davis, et al., 2006). Direct observation of treatment sessions or assessment of medical procedure billing are more accurate methods to determine implementation of the CPG (Kitson & Straus, 2010). Future investigations should examine the cost effectiveness of instituting guideline-based care pathways based on the CPG for management of individuals with PFP. There are other limitations, namely response bias is inherent in survey designs and may have inflated the number of self-identified READERS. We also relied on self-identification of READER and NonREADER status. The inability to verify readership of the CPG is an important limitation. We also did not assess how much or what sections of the CPG that respondents read. These findings are only relevant to the PFP CPG and future studies should examine beliefs and confidence of READERS versus NonREADERS of other guidelines in use in physical therapy.

CONCLUSION

PT's beliefs on appropriate exercise-based treatments for individuals with PFP were largely consistent with the CPG. However, we found considerable discordance between PT's beliefs and the CPG's recommendations with respect to risk factors and prognosis. READERS were more likely to agree with the CPG recommendations, but several

inaccurate beliefs remained, namely that increased Q-angle, increased dynamic knee valgus, hip weakness, greater body mass/body mass index, and increased foot pronation were risk factors for the development of PFP. Counter to CPG recommendations, NonREADERS also were more likely to believe that passive interventions were helpful for the management of individuals of PFP. Overall, these findings indicated that greater knowledge translation efforts are needed to counter persistent beliefs related to PFP risk factors, prognostic factors, and passive treatments.

Ethical Approval

Ethical Approval via XXX Institutional Research Board was obtained prior to the initiation of data collection

Declaration of Interest Statement

The authors have no conflicts of interest, including financial or endorsement relationships, to declare.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

References

- Adam, A. M. (2021). A Study on Sample Size Determination in Survey Research. *New Ideas Concerning Science and Technology*, 4, 125-134.
- Association, A. P. T. (2020). APTA Physical Therapy Workforce Analysis. In.

- Atsma, F., Elwyn, G., & Westert, G. (2020). Understanding unwarranted variation in clinical practice: a focus on network effects, reflective medicine and learning health systems. *Int J Qual Health Care*, 32, 271-274.
- Barton, C. J., Ezzat, A. M., Bell, E. C., Rathleff, M. S., Kemp, J. L., & Crossley, K. M. (2021). Knowledge, confidence and learning needs of physiotherapists treating persistent knee pain in Australia and Canada: a mixed-methods study. *Physiother Theory Pract*, 1-13.
- Becker, M., Strunk, K., Buschhaus, N., Buhn, S., & Pieper, D. (2020). Methodological Quality of Physical Therapy Guidelines and Their Suitability for Adaptation: A Scoping Review. *Phys Ther*, 100, 1296-1306.
- Blond, L., & Hansen, L. (1998). Patellofemoral pain syndrome in athletes: a 5.7-year retrospective follow-up study of 250 athletes. *Acta Orthop Belg*, 64, 393-400.
- Brushoj, C., Larsen, K., Albrecht-Beste, E., Nielsen, M. B., Loye, F., & Holmich, P. (2008). Prevention of overuse injuries by a concurrent exercise program in subjects exposed to an increase in training load: a randomized controlled trial of 1020 army recruits. *Am J Sports Med*, 36, 663-670.
- Cabana, M. D., Rand, C. S., Powe, N. R., Wu, A. W., Wilson, M. H., Abboud, P. A., & Rubin, H. R. (1999). Why don't physicians follow clinical practice guidelines? A framework for improvement. *JAMA*, 282, 1458-1465.
- Callaghan, M. J., & Selfe, J. (2007). Has the incidence or prevalence of patellofemoral pain in the general population in the United Kingdom been properly evaluated? *Phys Ther Sport*, 8, 37-43.
- Collins, N., Crossley, K., Beller, E., Darnell, R., McPoil, T., & Vicenzino, B. (2008). Foot orthoses and physiotherapy in the treatment of patellofemoral pain syndrome: randomised clinical trial. *British Medical Journal*, 337.
- Collins, N. J., Barton, C. J., van Middelkoop, M., Callaghan, M. J., Rathleff, M. S., Vicenzino, B. T., Davis, I. S., Powers, C. M., Macri, E. M., Hart, H. F., de Oliveira Silva, D., & Crossley, K. M. (2018). 2018 Consensus statement on exercise therapy and physical interventions (orthoses, taping and manual therapy) to treat patellofemoral pain: recommendations from the 5th International Patellofemoral Pain Research Retreat, Gold Coast, Australia, 2017. *Br J Sports Med*, 52, 1170-1178.
- Crossley, K. M., Stefanik, J. J., Selfe, J., Collins, N. J., Davis, I. S., Powers, C. M., McConnell, J., Vicenzino, B., Bazett-Jones, D. M., Esculier, J. F., Morrissey, D., & Callaghan, M. J. (2016). 2016 Patellofemoral pain consensus statement from the 4th International Patellofemoral Pain Research Retreat, Manchester. Part 1: Terminology, definitions, clinical examination, natural history, patellofemoral osteoarthritis and patient-reported outcome measures. *Br J Sports Med*, 50, 839-843.
- Cutler, D., Skinner, J. S., Stern, A. D., & Wennberg, D. (2019). Physician Beliefs and Patient Preferences: A New Look at Regional Variation in Health Care Spending. *Am Econ J Econ Policy*, 11, 192-221.
- Davis, D. A., Mazmanian, P. E., Fordis, M., Van Harrison, R., Thorpe, K. E., & Perrier, L. (2006). Accuracy of physician self-assessment compared with observed measures of competence: a systematic review. *JAMA*, 296, 1094-1102.
- Eysenbach, G. (2004). Improving the quality of Web surveys: the Checklist for Reporting Results of Internet E-Surveys (CHERRIES). *Journal of Medical Internet Research*, 6, e34.
- Fell, D. W., Burnham, J. F., & Dockery, J. M. (2013). Determining where physical therapists get information to support clinical practice decisions. *Health Info Libr J*, 30, 35-48.
- Hall, E. F. (1995). Physical therapists in private practice: information sources and information needs. *Bull Med Libr Assoc*, 83, 196-201.
- Hanney, W. J., Masaracchio, M., Liu, X., & Kolber, M. J. (2016). The Influence of Physical Therapy Guideline Adherence on Healthcare Utilization and Costs among Patients with Low Back Pain: A Systematic Review of the Literature. *PLoS One*, 11, e0156799.

- Hart, H. F., Barton, C. J., Khan, K. M., Riel, H., & Crossley, K. M. (2017). Is body mass index associated with patellofemoral pain and patellofemoral osteoarthritis? A systematic review and meta-regression and analysis. *Br J Sports Med*, 51, 781-790.
- . JOSPTasks. In. (2020)C. L. Ardern (Ed.), #JOSPTasks Rich Willy. Facebook.
- Kitson, A., & Straus, S. E. (2010). The knowledge-to-action cycle: identifying the gaps. *CMAJ*, 182, E73-77.
- Kredo, T., Bernhardtsson, S., Machingaidze, S., Young, T., Louw, Q., Ochodo, E., & Grimmer, K. (2016). Guide to clinical practice guidelines: the current state of play. *Int J Qual Health Care*, 28, 122-128.
- Lankhorst, N. E., Bierma-Zeinstra, S. M., & van Middelkoop, M. (2012). Risk factors for patellofemoral pain syndrome: a systematic review. *Journal of Orthopaedic & Sports Physical Therapy*, 42, 81-94.
- Matthews, M., Rathleff, M. S., Claus, A., McPoil, T., Nee, R., Crossley, K., & Vicenzino, B. (2017). Can we predict the outcome for people with patellofemoral pain? A systematic review on prognostic factors and treatment effect modifiers. *Br J Sports Med*, 51, 1650-1660.
- Neal, B. S., Lack, S. D., Lankhorst, N. E., Raye, A., Morrissey, D., & van Middelkoop, M. (2019). Risk factors for patellofemoral pain: a systematic review and meta-analysis. *Br J Sports Med*, 53, 270-281.
- Paci, M., Faedda, G., Ugolini, A., & Pellicciari, L. (2021). Barriers to evidence-based practice implementation in physiotherapy: a systematic review and meta-analysis. *Int J Qual Health Care*, 33.
- . Patellofemoral pain: Often known as "kneecap pain" or "runner's knee". In. (2019)A. o. O. P. Therapy (Ed.): Academy of Orthopaedic Physical Therapy.
- Patellofemoral Pain: Treating Painful Kneecaps. (2019). *J Orthop Sports Phys Ther*, 49, 633.
- Patellofemoral Pain: Using the Evidence to Guide Physical Therapist Practice. (2019). *J Orthop Sports Phys Ther*, 49, 631-632.
- Rathleff, M. S., Rathleff, C. R., Olesen, J. L., Rasmussen, S., & Roos, E. M. (2016). Is Knee Pain During Adolescence a Self-limiting Condition? *American Journal of Sports Medicine*, 44, 1165-1171.
- Saini, V., Brownlee, S., Elshaug, A. G., Glasziou, P., & Heath, I. (2017). Addressing overuse and underuse around the world. *Lancet*, 390, 105-107.
- Silva, D. D., Pazzinatto, M. F., Rathleff, M. S., Holden, S., Bell, E., Azevedo, F., & Barton, C. (2020). Patient Education for Patellofemoral Pain: A Systematic Review. *Journal of Orthopaedic & Sports Physical Therapy*, 50, 388-+.
- Silva, D. D., Rathleff, M. S., Holden, S., Bell, E., Azevedo, F., Pazzinatto, M. F., & Barton, C. (2020). Patients and clinicians managing patellofemoral pain should not rely on general web-based information. *Physical Therapy in Sport*, 45, 176-180.
- Smith, B. E., Hendrick, P., Bateman, M., Moffatt, F., Rathleff, M. S., Selfe, J., Smith, T. O., & Logan, P. (2017). Current management strategies for patellofemoral pain: an online survey of 99 practising UK physiotherapists. *BMC Musculoskelet Disord*, 18, 181.
- Thomeé, R. (1997). A comprehensive treatment approach for patellofemoral pain syndrome in young women. *Physical therapy*, 77, 1690-1703.
- van Middelkoop, M., van der Heijden, R. A., & Bierma-Zeinstra, S. M. A. (2017). Characteristics and Outcome of Patellofemoral Pain in Adolescents: Do They Differ From Adults? *J Orthop Sports Phys Ther*, 47, 801-805.
- Wallis, J. A., Roddy, L., Bottrell, J., Parslow, S., & Taylor, N. F. (2021). A Systematic Review of Clinical Practice Guidelines for Physical Therapist Management of Patellofemoral Pain. *Phys Ther*, 101.
- Wennberg, J. E. (2002). Unwarranted variations in healthcare delivery: implications for academic medical centres. *BMJ*, 325, 961-964.

- Willy, R., Bolgia, L., Hoglund, L., Logerstedt, D., & McDonough, C. (2021). Physical Therapy Management of Individuals With Patellofemoral Pain. In *2021 American Physical Therapy Association Combined Sections Meeting*. Virtual.
- Willy, R. W., Hoglund, L. T., Barton, C. J., Bolgia, L. A., Scalzitti, D. A., Logerstedt, D. S., Lynch, A. D., Snyder-Mackler, L., McDonough, C. M., & Altman, R. (2019). Patellofemoral Pain: Clinical Practice Guidelines Linked to the International Classification of Functioning, Disability and Health From the Academy of Orthopaedic Physical Therapy of the American Physical Therapy Association. *Journal of Orthopaedic & Sports Physical Therapy*, 49, CPG1-CPG95.
- Woolf, S. H. (1993). Practice guidelines: a new reality in medicine. III. Impact on patient care. *Arch Intern Med*, 153, 2646-2655.
- Young, J. L., Snodgrass, S. J., Cleland, J. A., & Rhon, D. I. (2021a). Timing of physical therapy for individuals with patellofemoral pain and the influence on healthcare use, costs and recurrence rates: an observational study. *BMC Health Serv Res*, 21, 751.
- Young, J. L., Snodgrass, S. J., Cleland, J. A., & Rhon, D. I. (2021b). Usual Medical Care for Patellofemoral Pain Does Not Usually Involve Much Care: 2-Year Follow-up in the Military Health System. *J Orthop Sports Phys Ther*, 51, 305-313.
- Zambarano, E. K., Bazett-Jones, D. M., de Oliveira Silva, D., Barton, C. J., & Glaviano, N. R. (2021). Athletic Trainers' Confidence and Knowledge to Manage Patellofemoral Pain. *J Athl Train*.

TABLE 1. Demographics of Physical Therapists Who Have (READERS) and Have Not (NonREADERS) Read the Clinical Practice Guideline for Patellofemoral Pain

	NonREADERS (n=253)	READERS (n=241)	Overall (n=494)
Age (mean ± standard deviation)	38.2±12.9†	41.4±13.2	39.7±13.1
Gender			
Men, n (%)	83 (33%)*	122 (51%)	205 (41%)
Women, n (%)	150 (59%)*	99 (41%)	249 (50%)
Non-binary, n (%)	1 (<1%)	0 (0%)	1 (<1%)
Prefer not to answer, n (%)	19 (8%)	20 (8%)	39 (8%)
Race			
White, n (%)	228 (90%)	218 (90%)	446 (90%)
Black or African American, n (%)	2 (1%)	1 (<1%)	3 (1%)
Asian, n (%)	9 (4%)	8 (3%)	17 (3%)
American Indian or Alaskan Native, n (%)	0 (0%)	2 (1%)	2 (<1%)
Other, n (%)	3 (1%)	2 (1%)	5 (1%)
Prefer not to answer, n (%)	11 (4%)	10 (4%)	21 (4%)
Ethnicity			
Hispanic, n (%)	10 (4%)	6 (2%)	16 (3%)
Non-Hispanic, n (%)	227 (90%)	219 (91%)	446 (90%)
Prefer not to answer, n (%)	16 (6%)	16 (7%)	32 (6%)
Highest PT Degree			
Certificate, n (%)	3 (1%)	2 (1%)	5 (1%)
Bachelor's, n (%)	31 (12%)	34 (14%)	65 (13%)

Master's, n (%)	26 (10%)	34 (14%)	60 (12%)
Doctorate, n (%)	193 (76%)	171 (71%)	364 (74%)
Additional Credentials**			
OCS, n (%)	29 (11%)	68 (28%)	97 (20%)
SCS, n (%)	3 (1%)	4 (2%)	7 (1%)
PCS, n (%)	3 (1%)	1 (<1%)	4 (1%)
NCS, n (%)	2 (1%)	0 (0%)	2 (<1%)
GCS, n (%)	1 (<1%)	1 (<1%)	2 (<1%)
ATC, n (%)	4 (2%)	8 (3%)	12 (2%)
CSCS, n (%)	5 (2%)	11 (5%)	16 (3%)
COMT, n (%)	8 (3%)	12 (5%)	20 (4%)
FAAOMPT, n (%)	2 (1%)	0 (0%)	2 (<1%)
Primary Setting			
Collegiate/Professional Sports Team, n (%)	1 (<1%)	3 (1%)	4 (1%)
Higher Education: Academia, n (%)	14 (6%)*	34 (14%)	48 (10%)
Inpatient/Home Health, n (%)	34 (13%)*	8 (3%)	42 (9%)
Outpatient, n (%)	187 (74%)	184 (76%)	371 (75%)
Other, n (%)	17 (7%)	12 (5%)	29 (6%)
Years Licensed			
< 5 years, n (%)	100 (40%)	73 (30%)	173 (35%)
5-10 years, n (%)	44 (17%)	40 (17%)	84 (17%)
11-15 years, n (%)	24 (9%)	22 (9%)	46 (9%)
16-20 years, n (%)	16 (6%)	19 (8%)	35 (7%)
>20 years, n (%)	69 (27%)	87 (36%)	156 (32%)
Country of Practice			
USA, n (%)	220 (87%)	200 (83%)	420 (85%)
Other, n (%)	33 (13%)	41 (17%)	74 (15%)
Experienced PFP			
Yes, n (%)	168 (66%)	170 (71%)	338 (68%)
No, n (%)	85 (34%)	71 (29%)	156 (32%)
Currently Treating PFP			
Yes, n (%)	130 (51%)*	162 (67%)	292 (59%)
No, n (%)	123 (49%)*	79 (33%)	202 (41%)
Treating Per Year			
0-5, n (%)	87 (34%)*	25 (10%)	112 (23%)
6-15, n (%)	85 (34%)	90 (37%)	175 (35%)
16-25, n (%)	36 (14%)*	59 (24%)	95 (19%)
26+, n (%)	40 (16%)*	66 (27%)	106 (21%)
Unknown, n (%)	5 (2%)	1 (<1%)	6 (1%)

PT=Physical Therapy, OCS=Orthopaedic Clinical Specialist, SCS=Sports Clinical Specialist, PCS=Pediatric Clinical Specialist, NCS=Neurologic Clinical Specialist, GCS=Geriatric Clinical Specialist, ATC=Certified Athletic Trainer, CSCS=Certified Strength & Conditioning Specialist, COMT=Certified Orthopaedic Manual Therapist, FAAOMPT=Fellow of the American Academy of Orthopaedic Manual Physical Therapy

†Significant difference between groups (independent t-test), $p < .05$

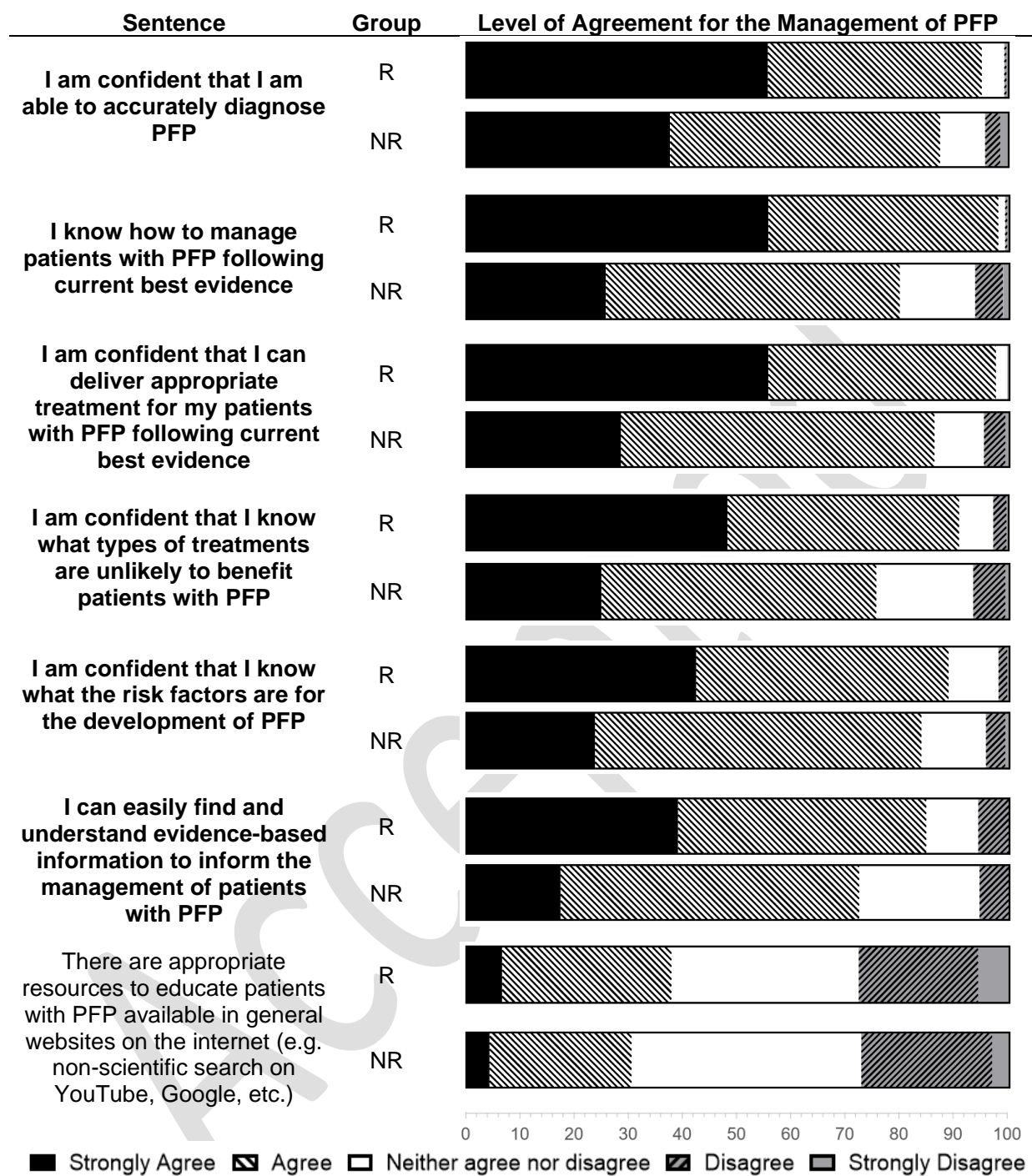
*Significant difference between groups (chi-squared), $p < .05$

**Significant difference between groups (chi-squared) when OCS/SCS combined and all others combined, $p < .05$

SUPPLEMENTARY TABLE:

Statistical analyses and results for demographics comparisons between NonREADERS and READERS			
	Chi-squared†	Cramer's V	p-value
Demographics			
Age (independent t-test)	-2.763	NA	0.008
Gender	0.1861	0.194	<.001
Race	4.328	0.094	0.632
Ethnicity	0.853	0.042	0.653
Highest PT Degree	2.445	0.07	0.485
Additional Credentials	45.563	0.304	<.001
Primary Setting	26.736	0.233	<.001
Years Licensed	6.538	0.115	0.162
Country of Practice	2.572	0.072	0.109
Experienced PFP	0.977	0.044	0.323
Currently Treating PFP	12.807	0.161	<.001
Treating Per Year	45.979	0.308	<.001

Figure 1: Comparison of confidence in the management of patellofemoral pain (PFP) between physical therapists who have and have not read the Clinical Practice Guideline.



PFP=patellofemoral pain, R=READER, NR=NonREADER, **Bold**=significant group difference ($P<0.01$)

Figure 2: Knowledge of risk factors for patellofemoral pain (PFP) between physical therapists who have and have not read the Clinical Practice Guideline.

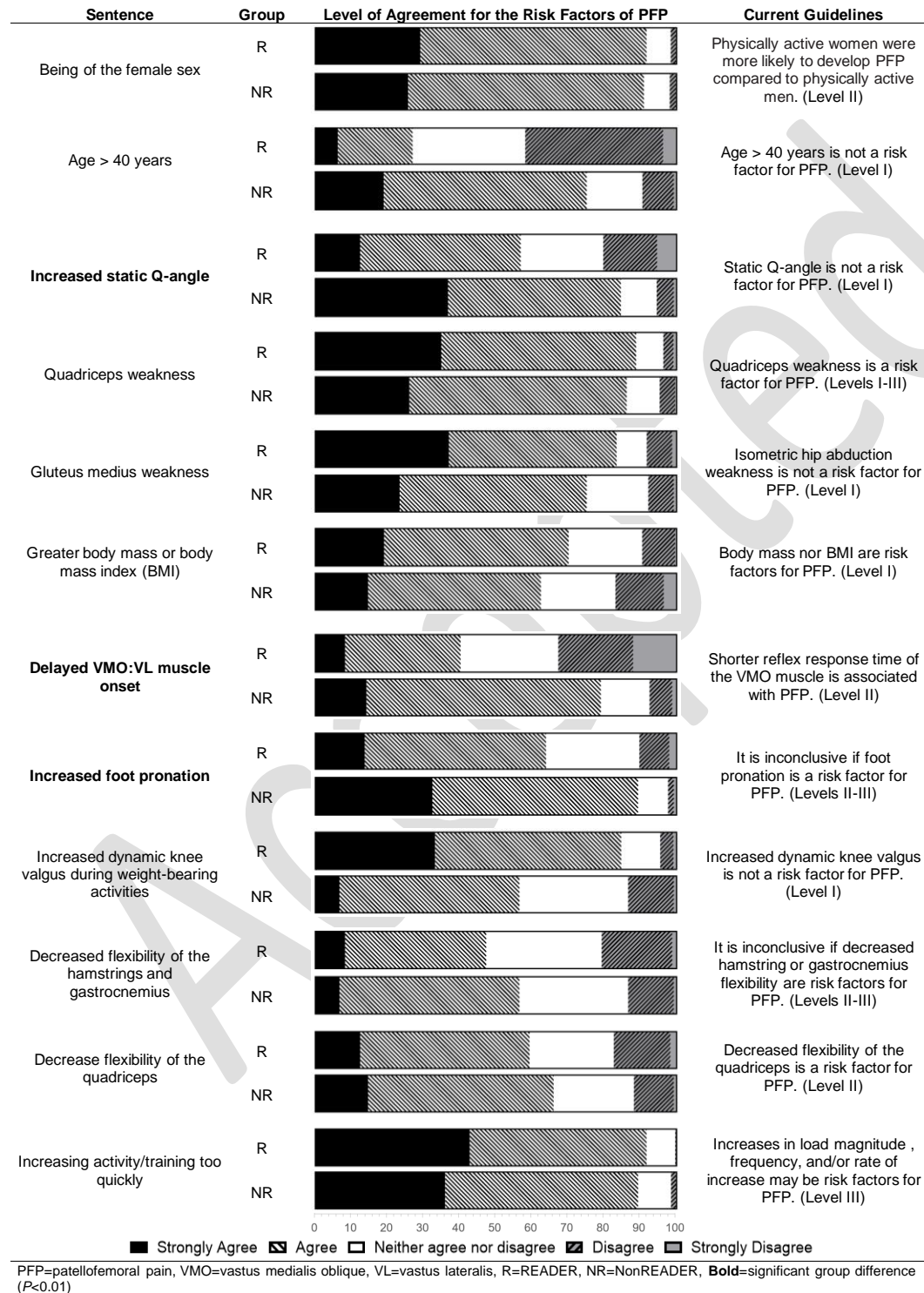


Figure 3: Knowledge of patellofemoral pain (PFP) diagnostic and prognostic factors between physical therapists who have and have not read the Clinical Practice Guideline.

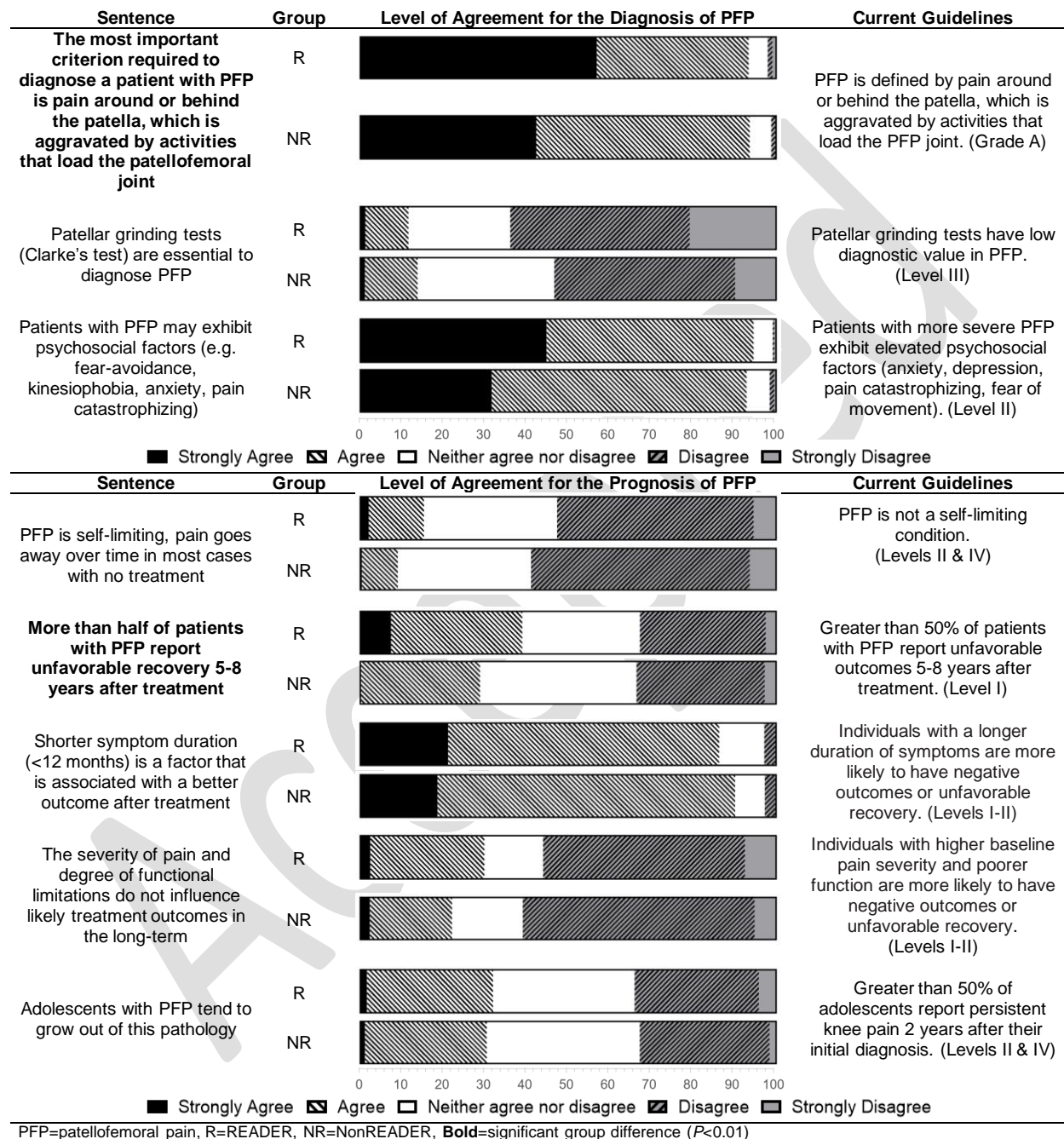


Figure 4: Knowledge of exercise-related treatments for patellofemoral pain (PFP) between physical therapists who have and have not read the Clinical Practice Guideline.

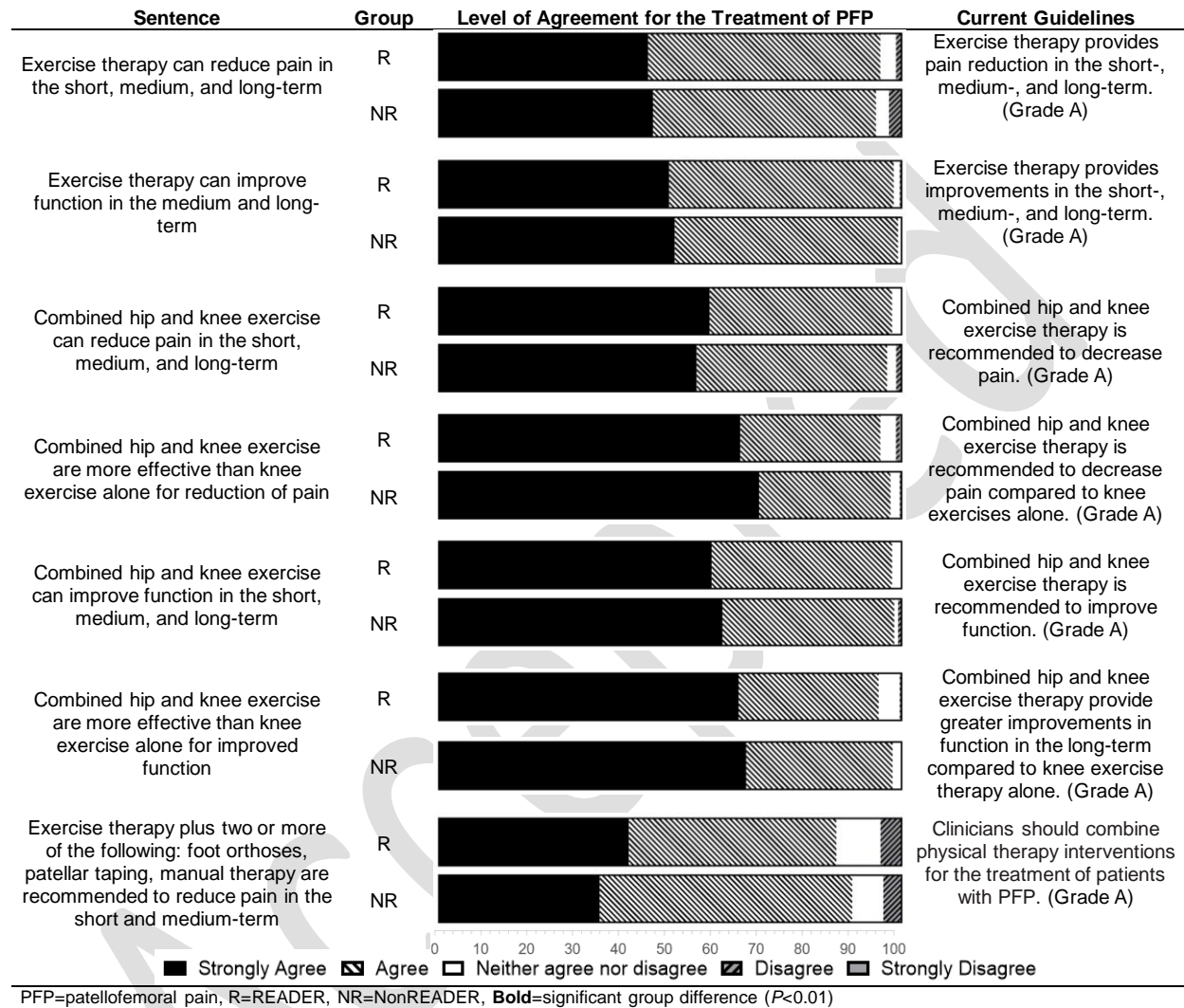
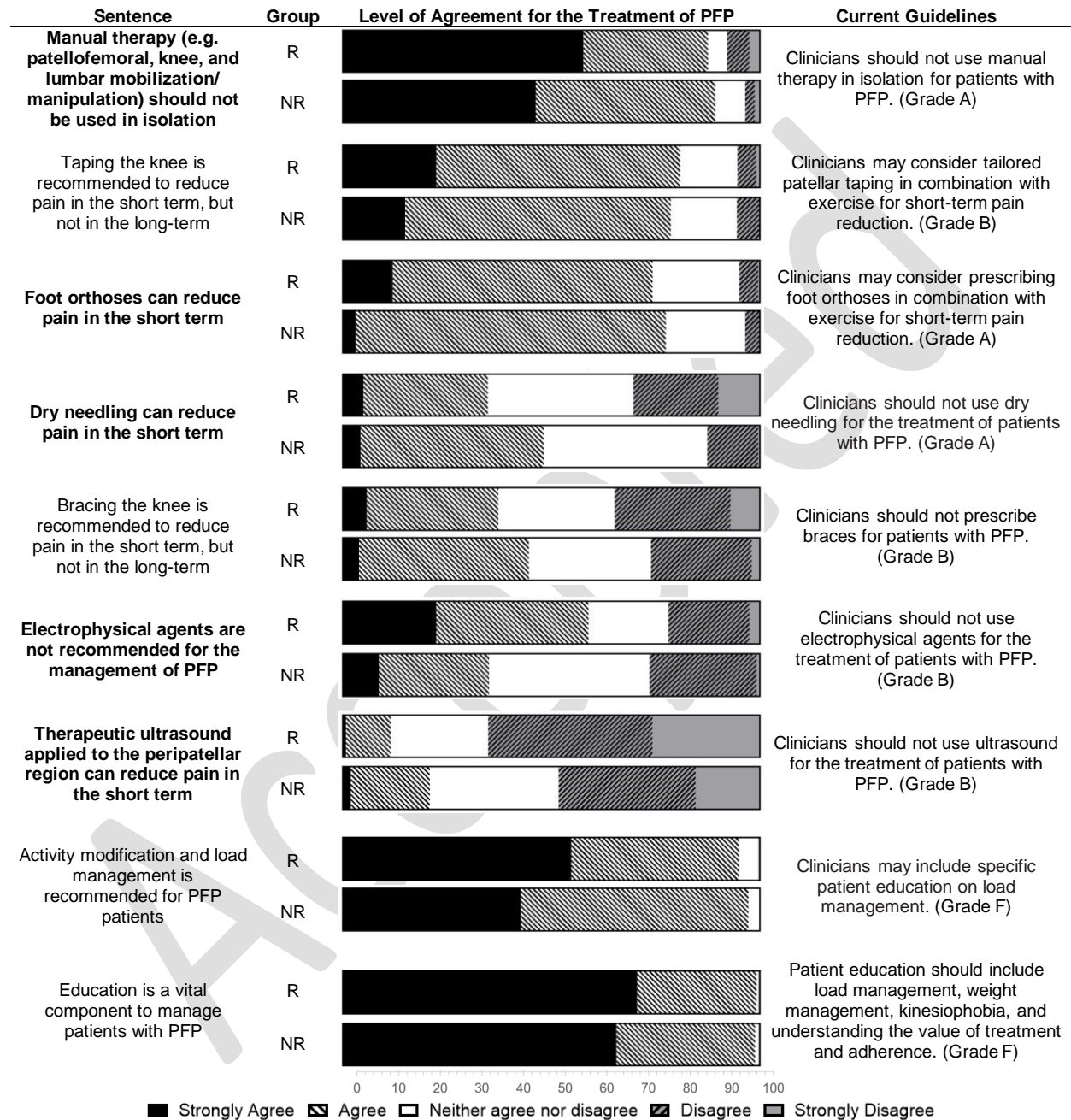


Figure 5: Knowledge of non-exercise-related treatments for patellofemoral pain (PFP) between physical therapists who have and have not read the Clinical Practice Guideline.



PFP=patellofemoral pain, R=READER, NR=NonREADER, **Bold**=significant group difference ($P<0.01$)

Appendix: Survey

PT-PFP Knowledge Study Survey

Are you a licensed or registered physical therapist or physiotherapist?

☐ Yes

☐ No

What is your age?

Gender (optional; fill in the blank):

Race

☐ White

☐ Black or African American

☐ American Indian or Alaska Native

☐ Asian

☐ Native Hawaiian or Pacific Islander

☐ Other

☐ Prefer not to answer

Ethnicity

- ☐ Hispanic
- ☐ Non-hispanic
- ☐ Prefer not to answer

Highest level of PT Clinical Education:

- ☐ Bachelor's Degree in Physical Therapy
- ☐ Certificate in Physical Therapy
- ☐ Master's Degree in Physical Therapy (MPT, MSPT)
- ☐ Doctorate in Physical Therapy (DPT)

Additional Education:

- ☐ Additional Master's Degree (MS)
- ☐ Additional Clinical Doctorate Degree (DAT, DPM, DC, DrOT)
- ☐ Academic Doctorate (PhD, EdD, DSc)
- ☐ Professional degree (MD, DO, JD)
- ☐ Other _____

Credentials held in addition to physical therapist licensure (select all that apply)

- ☐ ABPTS Clinical Certification, Specify: _____
- ☐ Manual Therapy Certification (COMT or equivalent)
- ☐ CSCS

- ☐ ATC
- ☐ OT
- ☐ Other _____

What is the **primary** setting that you work in?

- ☐ Outpatient Office: Corporate Owned
- ☐ Outpatient Office: PT-owned Private Practice
- ☐ Outpatient Office: Hospital Owned
- ☐ Inpatient: Hospital, In-patient Rehab, SNF
- ☐ Home Health
- ☐ Secondary School
- ☐ Collegiate/Professional Sports Team
- ☐ Higher Education: Academia
- ☐ Other _____

How many years have you been licensed as a physical therapist?

- ☐ < 5 years
- ☐ 5-10 years
- ☐ 11-15 years
- ☐ 16-20 years
- ☐ >20 years

What is the primary country in which you currently practice?

Have you ever experienced patellofemoral pain?

- ☐ Yes
- ☐ No

Are you currently treating a patient with patellofemoral pain?

- ☐ Yes
- ☐ No

How many cases of patellofemoral pain do you see per year:

How would you define patellofemoral pain (PFP)?

Please rate your level of agreement with the following statements related to the **management** of PFP

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
I am confident that I am able to accurately diagnose PFP	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I know how to manage patients with PFP following current best evidence	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am confident that I can deliver appropriate treatment for my patients with PFP following current best evidence	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am confident that I know what types of treatments are unlikely to benefit patients with PFP	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am confident that I know what the risk factors are for the development of PFP	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please rate your level of agreement with the following statements related to **diagnosis** of patients with PFP

	Strongly Agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
The most important criterion required to diagnose a patient with PFP is pain around or behind the patella, which is aggravated by activities that load the patellofemoral joint (e.g. squatting, stair ambulation, jogging/running, hopping/jumping)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
At least one imaging exam (e.g. MRI, x-ray, ultrasound) should be used to confirm PFP diagnosis	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Patellar grinding tests (Clarke's test) are essential to diagnose PFP	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Signs such as knee crepitus, tenderness on patellar facet palpation, and small effusion are essential to diagnose PFP.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Knee crepitus is related to increased pain and decreased function in PFP	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please rate your level of agreement with the following factors that would **increase** an individual's **risk** of developing PFP

	Strongly Agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
Being of the female sex	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Age > 40 years	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Increased static Q-angle	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Quadriceps weakness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
History of patellar instability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Gluteus medius weakness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Greater body mass or body mass index (BMI)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Delayed VMO:VL muscle onset	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Increased foot pronation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Increased dynamic knee valgus during weight-bearing activities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Decreased flexibility of the hamstrings and gastrocnemius	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Decrease flexibility of the quadriceps	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Increasing activity/training too quickly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Are there any additional **risk factors** you believe would increase an individual's risk of developing PFP?

Please rate your level of agreement with the following statements related to **prognosis** of patients with PFP

	Strongly Agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
PFP is self-limiting, pain goes away over time in most cases with no treatment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
More than half of patients with PFP report unfavorable recovery 5-8 years after treatment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Shorter symptom duration (<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The severity of pain and degree of functional limitations do not influence likely treatment outcomes in the long-term	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Adolescents with PFP tend to grow out of this pathology	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There is strong evidence that psychological factors (e.g. kinesiophobia) influence long-term outcomes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please rate your level of agreement with the following statements related to **treatment** of patients with PFP

Accepted

	Strongly Agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
PFP is related primarily to biomechanical deficits and therefore using treatment to address these deficits should be the primary focus of treatment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Exercise therapy can reduce pain in the short, medium, and long-term	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Exercise therapy can improve function in the medium and long-term	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Combined hip and knee exercise can reduce pain in the short, medium, and long-term	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Combined hip and knee exercise are more effective than knee exercise alone for reduction of pain	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Combined hip and knee exercise can improve function in the short, medium, and long-term	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Combined hip
and knee
exercise are
more effective
than knee
exercise alone
for improved
function

☐ ☐ ☐ ☐ ☐

Please rate your level of agreement with the following statements related to treatment of patients with PFP (continued)

Accepted

	Strongly Agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
Movement retraining (gait, squatting, etc.) is recommended for treating PFP	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Manual therapy (e.g. patellofemoral, knee, and lumbar mobilization/manipulation) should not be used in isolation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Therapeutic ultrasound applied to the peripatellar region can reduce pain in the short term	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Taping the knee is recommended to reduce pain in the short term, but not in the long-term	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Foot orthoses can reduce pain in the short term	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Dry needling can reduce pain in the short term	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bracing the knee is recommended to reduce pain in the short term, but not in the long-term	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Electrophysical agents are not recommended for the management of PFP	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Activity modification and load management is recommended for PFP patients	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Exercise therapy plus two or more of the following: foot orthoses, patellar taping, manual therapy are recommended to reduce pain in the short and medium-term	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please rate **your level of agreement** with the following statements

Accepted

	Strongly Agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
Surgery is more effective than exercise to reduce pain and improve function in patients with PFP	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Imaging exams (e.g. MRI, x-ray, ultrasound) should influence the management of patients with PFP	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Patients with PFP may exhibit psychosocial factors (e.g. fear-avoidance, kinesiophobia, anxiety, pain catastrophizing)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Patients with PFP participate in less physical activity due to their knee pain	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Education is a vital component to manage patients with PFP	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

There are appropriate resources to educate patients with PFP available in general websites on the internet (e.g. non-scientific search on Youtube, Google, etc.)

I can easily find and understand evidence-based information to inform the management of patients with PFP

When treating individuals with PFP, **how often do you**

	All the time	Most of the time	Sometimes	Occasionally	Never
Educate them about how long their recovery will take	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Discuss potential physical drivers of pain	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Discuss potential non-physical drivers of pain	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Discuss activity modification and load management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Discuss knee crepitus	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Recommend that patient continue with exercises that are painful	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Utilize physical performance outcome measures (e.g. step-down test)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Utilize patient-reported outcome measures (e.g. Lower Extremity Functional Scale)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Provide written or video-based exercises	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Provide written
educational
information
about PFP
(other than
exercise info)

☐☐☐☐☐

Provide referral
to educational
websites about
PFP

☐☐☐☐☐

Have you read the *Patellofemoral Pain Clinical Practice Guideline* (published in the Journal of Orthopaedic & Sports Physical Therapy in 2019)

☐ Yes

☐ No