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Impact of Personalized Outcomes Forecasts on Clinical Reasoning of Physical Therapists in Intermittent Claudication: A Vignette Study

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Abstract

Objective. Guidelines recommend supervised exercise therapy and lifestyle counseling by a physical therapist as initial treatment for patients with intermittent claudication. However, guidelines provide only a crude estimate of the outcomes that therapists and patients might expect from treatment. The purpose of this study was to explore the impact of personalized outcomes forecasts (POFs) on the decision-making process of physical therapists and to learn lessons on facilitating the use of forecasts in daily practice.

Methods. A vignette-based, think-aloud interview study design was used. The participants were physical therapists trained in treating patients with intermittent claudication. Vignettes described fictitious patients diagnosed with intermittent claudication and included POFs. A directed approach was used to code, organize, and describe the data. Transcripts were analyzed using a thematic approach.

Results. Sixteen therapists participated in the study. Three themes were identified: (1) setting and contextualizing treatment expectations, (2) setting (shared) goals and (de)motivating the patient, and (3) establishing and monitoring the treatment plan. Therapists mentioned that POFs could be useful for setting expectations and realistic treatment goals, contextualizing expected treatment response, stimulating patients to achieve their goals, and deciding on treatment frequency and treatment timing. Therapists thought POFs would be of less use for changing treatment goals during follow-up visits or for establishing intensity or type of training.

Conclusion. To overcome challenges that may arise when adopting POFs in daily practice, adequate training of physical therapists should be conducted. Potential areas to address with training include statistical and data literacy as well as guidance on integrating POFs with existing treatment protocols.

Impact. The use of POFs by physical therapists might contribute to a more person-centered care approach. The insights provided by this study on the first use of POFs by physical therapists can serve as an example and lesson on how to optimally implement such supporting tools into daily practice.

Keywords: Decision-Making, Exercise Therapy, Intermittent Claudication, Patient-Centered Care, Peripheral Arterial Disease, Prognosis

Introduction

Intermittent claudication is caused by atherosclerotic narrowing in the arteries of the lower extremities and is defined as walking-induced discomfort or pain in the leg or hip muscles, which attenuates after a brief rest.[1,2] Recommended treatment for patients with intermittent claudication is supervised exercise therapy and lifestyle guidance administered by a trained physical therapist.[1-3] However, recommendations for guidelines are generally very broad and lack support to personalize therapy to the individual patient.[4,5]

To support clinicians in adapting the guidelines to individual patients and making individualized decisions, personalized outcomes forecasts (POFs) might be of value.[4,6-9] A POF is an estimation of an individual patient's outcome over time based on historic outcome data of patients with similar characteristics to the individual patient.[6] Only a specific subset of previously treated patients is selected from existing records to create the forecasts.[4,6-8] In physical therapy care, outcome forecasts have already been proposed in different subfields to support therapists and patients by increasing their insight into the expected treatment course.[7,10,11]

Personalized outcome forecasts might be used in practice to facilitate therapists' clinical reasoning by supporting the personalization of the care plan. Furthermore, therapists might be able to better inform patients of the expected course and outcome of therapy, thereby supporting patient engagement and shared decision-making. However, the impact of POFs on clinical reasoning and shared decision-making potential has yet to be examined.

The goal of this vignette study was to explore how the use of POFs might impact the treatment of patients with intermittent claudication when used by physical therapists specialized in treating this population, specifically, the impact of the forecasts on (1) goal-setting, (2) the clinical reasoning process, and (3) the willingness of therapists to make shared decisions with patients. Developing and implementing personalized outcome forecasts was considered ideal in the care context of Dutch physical therapists treating patients with intermittent claudication for 2 reasons. First, this group of therapists is working evidence and guideline based due to extensive implementation activities in the past.[12] We believe this is a prerequisite for personalizing care. Second, due to the nationwide Chronic Care Network,[13] sufficient routinely collected data are available to adequately develop personalized outcome forecasts.[14] A secondary goal was to explore for opportunities to improve the outcomes forecast tool to facilitate implementation in clinical practice.

Methods

Study Design and Setting

This study used a vignette-based, think-aloud interview design with a narrative approach to explore the effect of POFs on physical therapists' clinical reasoning and willingness to make shared decisions in treating patients with intermittent claudication. A narrative approach means that individual experiences on the subject are gathered through conversation and used as raw data.[15] The think-aloud method was used to capture participants' thoughts and feelings as a way of illuminating the underlying reasoning. This method assumes that an individual's cognitive process is directly accessible as verbal data; it is a well-established method to describe the sequence of clinical reasoning thoughts.[16-18] The study was conducted from June to September 2019 in the Netherlands through Chronic CareNet. Chronic CareNet is a nationwide network of physical therapists specifically trained to treat patients with non-communicable chronic disease (among which intermittent claudication) according to the most recently published national guideline.[1,2] This study was reported according the Standards for Reporting Qualitative Research guideline.[19] This study was reviewed by the Medical Research Ethics Committees United (reference no. W19.094) and was determined to be exempt from formal medical ethical approval. Written informed consent was obtained from all participants.

Personalized Outcomes Forecasts

POFs are individual estimates of patients' maximal walking distance over a 6-month course of supervised exercise therapy. Maximal walking distance is a commonly used clinical outcome measure in this patient population. Briefly, a patient is instructed to walk on a treadmill at a standardized speed until claudication-related pain forces the patient to stop.[20] POFs and the underlying methodology were previously developed using a neighbors-based prediction approach.[6,7] By this approach, a prediction for any new patient can be generated using historical data of similar patients. POFs are integrated into a web-based application accessible for therapists to visualize the expected trajectory of maximal walking distance for a patient.

Participants

Participants were recruited by the first author (A.S., PhD candidate with Chronic CareNet) through convenience sampling. Physical therapists associated with Chronic CareNet who worked in outpatient clinics close to the interview location were invited by email to participate in this study. All therapists affiliated with Chronic CareNet were naive in using POFs, because these forecasts were not implemented in daily practice. Therapists who did not respond to the email were additionally contacted by phone. The final number of participants was based on data saturation. Data saturation was achieved because no new codes emerged during analysis. This was checked by performing 1 additional interview after coding all the previous interviews. Study participants were compensated with a gift voucher and Chronic CareNet continuing education credits.
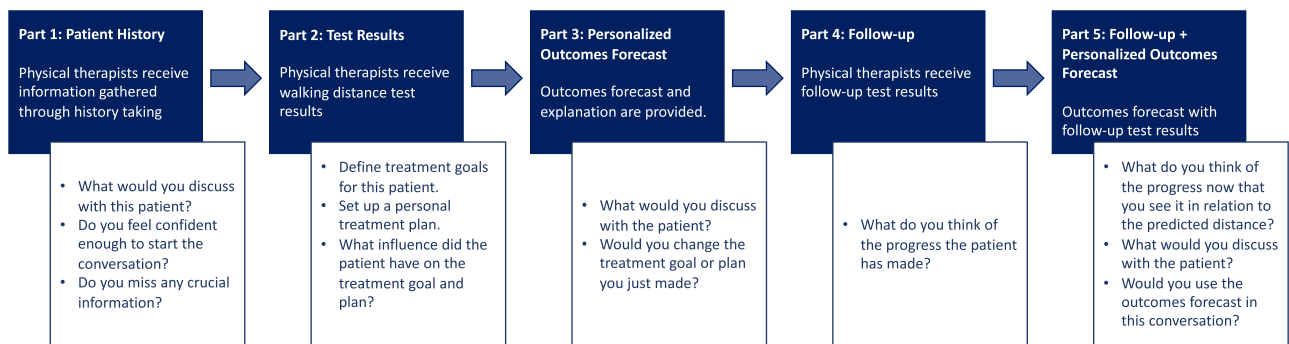
Vignettes

Vignettes were designed according to current recommendations to include a clearly written, concise, narrative, and story-like progression. We aimed to include a balance of factors while avoiding misleading details.[21,22] All vignettes were based on real patients with intermittent claudication referred to a physical therapist for supervised exercise therapy. Each vignette included 3 different structural elements: (1) experimental aspects, wherein the effect on the outcomes forecasts was assessed by systematically manipulating these aspects across the vignettes; (2) controlled aspects, which were kept consistent across vignettes to limit additional unwanted variance; and (3) contextual aspects, which were used to create some variance across vignettes.[21,23] The complete factorial combination of the experimental aspects resulted in 12 different vignettes, of which 6 case vignettes were selected for the study by a panel of 5 experts (3 physical therapists [2 with

Table 1. Characteristics of Participating Physical Therapists[a]

Participant ID	Age, y	Sex	Degree	Years Affiliated Chronic CareNet[b]	Number of Patients With IC	Interview Duration (Min)
1	43	Male	Bsc	6	3/wk	40
2	34	Female	Msc	3	6 total[c]	42
3	48	Female	Bsc	8–9	5–6/wk	63
4	27	Female	Bsc	2–3	2–3/wk	57
5	34	Female	MSc	8–9	7–8 total[c]	51
6	44	Female	Bsc	3	6 total[c]	73
7	41	Male	Bsc	6	6–7/wk	73
8	29	Male	Bsc	3	2 /wk	36
9	54	Male	Bsc	6	6 /wk	53
10	60	Male	Bsc	8–9	6 /wk	78
11	28	Female	Bsc	4	7/wk	78
12	49	Female	Bsc	4	4 total[c]	65
13	59	Male	Bsc	7–8	1/wk	43
14	30	Male	Bsc	4–5	6/wk	73
15	30	Female	MSc	4 mo	2/wk	44
16	31	Female	Bsc	4 (no longer active)	5/wk	73

[a]Bsc = Bachelor of Science; IC = intermittent claudication; MSc = Master of Science. [b]Years affiliated with Chronic CareNet = the minimum years of experience specifically treating patients with intermittent claudication. [c]In total = the total number of patients who are treated now but not necessarily visiting every week.

Figure 1. Overall structure of vignettes.

experience in treating patients with intermittent claudication] and 2 researchers). Experimental effects included age, walking distance, and therapy outcome over time. Controlled aspects were the diagnostic findings (eg, diagnosed intermittent claudication). Contextual aspects included patient sex, symptoms, smoking status, height, and weight.

The vignettes and interview guide (see Suppl. Material [available in Dutch only]) were developed by the first author (A.S.) in collaboration with the project group (T.J.H., A.J.K., S.P., and P.J.W.). The development of these vignettes was informed by (1) the framework for clinical reasoning according the Hypothesis Oriented Algorithm for Clinicians II and (2) the 3 stages of shared decision-making: (a) explanation of treatment options, (b) providing information, and (c) compiling a treatment plan or goals together with the patient.[24,25] Each vignette was divided into 5 parts: (1) the patient history, (2) treadmill test results, (3) baseline personalized outcome forecasts, (4) 3-month follow-up results, and (5) follow-up personalized outcome forecasts. After each part of a vignette, the interviewer asked questions according to the interview guide. The overall structure and content of the vignettes and the interview guide are summarized in Figure 1. In 2 separate interviews with 2 physical therapists, the interviewer tested the vignettes and interview guide under the supervision of the project group. No changes were made after testing.

Study Procedure and Data Collection

Participants received verbal and written information regarding the aim of the study and the think-aloud method. Interview sessions (approximately 1 hour) were one-on-one. Each participating physical therapist was audio-recorded during the session. A directive approach was applied, meaning that the interviewer directed the semi-structured interviews by asking specific questions according to the interview guide and the vignettes.[26] Interviews were performed by a qualified and experienced research assistant (A.O.B., psychologist, MSc) with 7 years of experience in performing semi-structured interviews. A.O.B. was additionally trained for this study, because she is not a physical therapist. Participants were not familiar with any details of the interviewer. All participants received a brief verbal explanation of the POFs and how to interpret them (see Suppl. Material). Each participant worked through at least 1 vignette or 2 if time allowed. Participants could determine their own tempo on reading and answering the questions.

Data Analysis

Interviews were transcribed by a professional company. Transcriptions were not returned to participants for correction. Transcripts were analyzed by a thematic approach to identify, analyze, and report patterns (themes) within the data. Thematic analysis comprised 6 different phases according

Quotes	Codes	Theme
"I would inquire about [the patient's] expectations. How far he'd think he'll be able to walk, and for how long he expects to receive walking training. And yes, indeed I would just show and explain the graph to him. Show him what he can expect after six months […] and see if that matches his expectations." (Therapist 4, case 2)	Using personalized outcomes forecasts to talk about expectations with the patient	Setting and contextualizing treatment expectations
"I would discuss that [the estimated walking distance] is the most achievable. That would be progress, but the initial goal of 500 meter might be too ambitious." (Therapist 13, case 1)	Using personalized outcomes forecasts to talk about motivation with the patient	
"I do feel that I can substantiate the expectations about walking distance better with use of [the personalized outcomes forecasts]" (Therapist 4, case 3)	Not using the personalized outcomes forecasts to talk with the patient	
"If you can see the expected walking distance using [the personalized outcomes forecasts], I think you can set more realistic goal together. [The patient] says: 'I want to walk five kilometers', I can't say [the patient] will not be able to. But with [the personalized outcomes forecasts] you could create a more realistic perception." (Therapist 5, case 3)	Using personalized outcomes forecasts to explain about baseline walking distance to the patient	
"I would not discuss the expectations according the personalized outcomes forecasts. If [the patient] would not reach this distance, than the motivation would be gone." (Therapist 12, case 1)		

Figure 2. Example of creating themes from codes from transcripts.

to the described outlines of this method: getting to know the data, generating codes, searching for themes, reviewing themes, defining and naming themes, and finally producing the report.[27] A directed approach was used to code, organize, and describe the data. Coding and data analyses were performed by 2 independent researchers (A.S. and A.O.B.) using coding software (ATLAS.ti Scientific Software Development GmbH, Berlin, Germany, 8.4. 20). A description of the coding tree and framework for the themes were provided by the first author. The coding tree and framework were based on the vignette and interview guide. Consensus meetings with the complete research team were used to optimize the coding tree, framework for the themes, and final codes. See Figure 2 for an example of creating codes and themes.

Trustworthiness

To ensure trustworthiness of the study, different strategies were applied. First, data were coded and analyzed by 2 independent researchers (A.S. and A.O.B.). Second, professional coding software was used to enhance confirmability of the outcomes (ATLAS.ti 8.4. 20).[28] Third, detailed context data were gathered to increase transferability, including participant characteristics, description of the vignettes, research group background, and interview setting.[29] Fourth, to create good compatibility between the participants and the interviewer, it was explained that there were no right or wrong answers. Furthermore, the interviewer was not a physical therapist, which allowed her to easily question every decision that physical therapists made without being judgmental or normative. Last, member checking was continuously performed during the interview sessions through verbal verifying of information provided by the participants.[29]

Role of the Funding Source

The funder played no role in the design, conduct, or reporting of this study.

Results

A total of 35 physical therapists were approached by phone to participate. Of these potential recruits, 16 therapists agreed to participate. The primary reason for not participating was lack of time. See Table for demographic information participants.

Physical therapists were asked what they would normally discuss with patients during the history taking. Therapists mentioned typically discussing the course of the disease and content (and advantages) of supervised exercise therapy. Moreover, therapists aimed to gain insight into patients' intrinsic motivation, knowledge, and expectations of supervised exercise therapy. Other topics included the patient's complaints, symptoms, functional limitations, comorbidity, lifestyle (ie, smoking habits and diet), social environment, medication use, home situation, and daily activities (including sport activities). Some therapists mentioned using the patient interview to establish a trusting relationship with the patient. In total, 3 themes were identified related to the potential role of the POF in care: (1) setting and contextualizing treatment expectations, (2); setting (shared) goals and (de)motivating the patient, and (3) establishing and monitoring the treatment plan.

Setting and Contextualizing Treatment Expectations

Physical therapists mentioned that they believed POFs could be useful for setting expectations of therapy outcome and putting the expected treatment response in the context of the patient. Moreover, therapists mentioned POFs could be helpful to explain about baseline walking distance in relation to patient-specific characteristics.

> "I would inquire about [the patient's] expectations. How far he'd think he'll be able to walk, and for how long he expects to receive walking training. And yes, indeed I would just show and explain the graph to him. Show him what he can expect after 6 months [. . .] and see if that matches his expectations." —Participant 4, case 2.
> [Participant explains what he would discuss with the patient]: "Does [the patient] experience any other problems? It is expected that he can walk 380 meters after 3 months [of walking therapy], but the complete picture is important. Does he suffer from dyspnea afterwards? How is his walking pattern? For example, if he reaches 380m stumbling, he is able to walk that distance, but not pleasantly." —Participant 12, case 1 (See Fig. 3 for the POF for case 1.)

> Conversely, some physical therapists mentioned they would not use the POF during the patient interview. These therapists felt confident their personal experience in treating these patients was sufficient to explain the expected prognosis. Others reported that they did not want to compare their patient with the results of other patients but would rather treat them entirely on an individual basis. Also, some therapists believed the graphs were too complicated for patients and themselves. Finally, some therapists could see themselves using the POFs but did not see it having an impact on the care provided.

> "I do not need [the personalized outcomes forecast] to explain the prognosis to my patients. [. . .] I can imagine it being useful [in discussing the therapy] for the patient though. A patient likes to be displayed the expectations. But I can only speak from my own perspective." —Participant 3, case 4.
> [A participant who appeared to misinterpret the forecasts said]: "Most patients will understand the graphs to the same extent as I do and they would think the graphs and questionnaires are pointless, as they come here to walk better. For my patient population it's irrelevant whether they perform better or worse than the national average; they have their own goal." —Participant 6, case 4.

Setting (Shared) Goals and (De)motivating the Patient

Physical therapists explained how they normally set treatment goals together with the patient based on the initial measured walking distance as well as the patient's preferences. In the case that a patient sets an unrealistic goal, therapists mentioned they would intervene to help set an achievable goal. Physical therapists believed POFs could be helpful particularly in setting realistic treatment goals, which would in turn stimulate patients to achieve these goals.

> "If a patient has a goal to walk 2 kilometers after 1 year . . . and the prognosis suggests she will walk 1 kilometer after 6 months . . . then you can test the feasibility of the walking therapy goal." —Participant 1, case 6. (See Fig. 4 for the POF for case 6.)
> "If you see what the predicted values are, I think you are able to set a realistic goal together. He [the patient] says: "I want to walk 5 kilometers." [. . .] With the prediction tool you would be able to set a more realistic expectation. You can tell the patient what is the evidence-based prediction and base your goal on that." —Participant 5, case 3. (See Fig. 5 for the POF for case 3.)

> Therapists also believed that POFs would be useful for setting secondary therapy goals. Therapists mentioned setting the secondary goals typically by themselves, with less involvement from the patient, based on the patient's needs. Secondary goals could include things like lifestyle modifications, gaining strength, optimizing balance, improving walk pattern quality, increasing daily activity, and enhancing health self-management. The therapists mentioned that POFs might provide a springboard for discussing such goals (eg, patient motivation, physical condition, comorbidity, and social factors) with the patient.

> "Yes, so I would discuss [setting the primary goals] with the patients. However, regarding the secondary goals, I think I would actively suggest to the patient what progress would be desirable in my opinion." —Participant 15, case 2.

Physical therapists pointed out that POFs could also stimulate patients to achieve their goals. At the initiation of therapy, therapists mentioned it might be motivating for patients to see what is possible. During therapy, the outcomes forecast would be helpful for starting a conversation about motivation by showing a patient's progress compared with the original predicted value.

> [Therapist looking at the graphs]: "Well that's just fantastic. I would tell someone: "if you were going to do what is
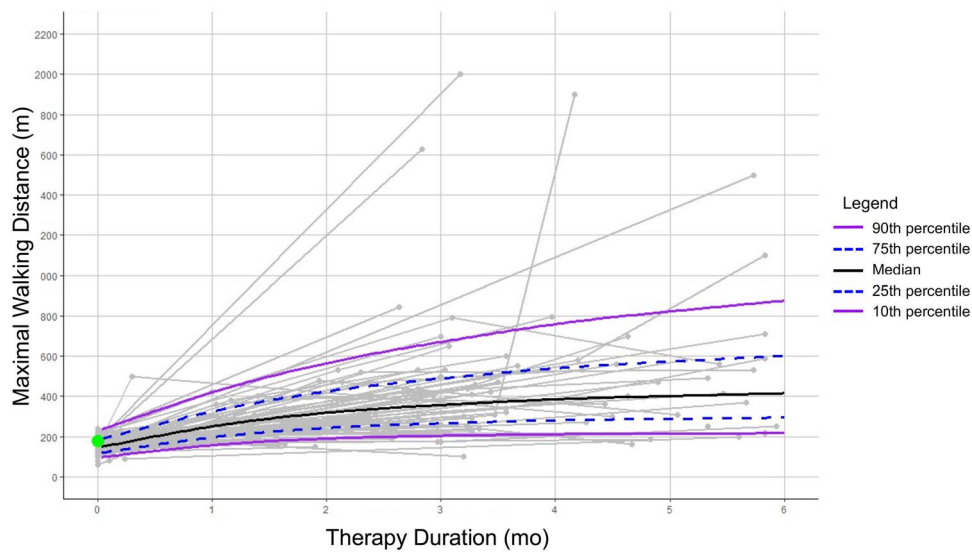
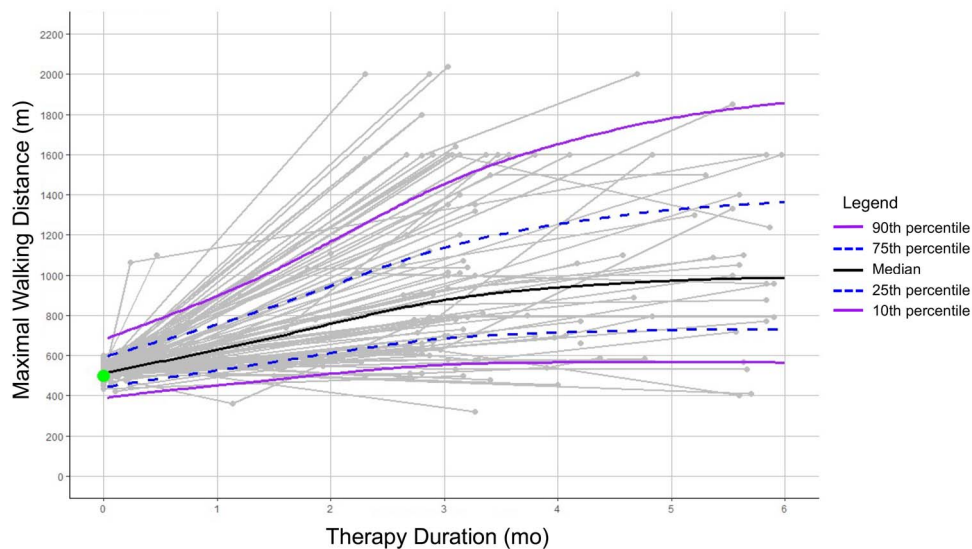**Figure 3.** Personalized outcomes forecast case 1.

Figure 4. Personalized outcomes forecast used in case 6.

best for you, it is projected that after 3 months you could already walk 1160 meters, instead of what you can walk right now." I think that would be a motivation for those people." —Participant 9, case 3. (See Fig. 5 for the POF for case 3.)

[Participant is asked whether he/she would change the original treatment goal after seeing the personalized outcomes forecast]: "Yes, I would keep the goal of 1 kilometer. Well, maybe he will reach 800 meters, or 850 m, but I think this will be a good motivation to achieve his own goal." —Participant 14, case 2.

 At the same time, therapists also mentioned how POFs could potentially demotivate a subgroup of patients at the start of therapy or during therapy. In particular, therapists believed that patients with a relatively poorer prognosis might be discouraged even before starting therapy. Therapists mentioned they would try to lower the patient's goal before showing the POF or only show it if a patient was performing above the predicted walking distance during follow-up

measurements. Therapists indicated it could be disappointing for patients to see the POF if they performed below the predicted walking distance during follow-up.

"So, the prognosis is not very favorable. If you follow the line further, the line would flatten. So, at the end there is not much progress anymore. That is absolutely not stimulating." —Participant 1, case 6. (See Fig. 4 for the POF for case 6.)

"I am not going to compare my patient to other patients. [The patient] is performing below average. So be it. It is not about how all other patients in the population performed." —Participant 12, case 1. (See Fig. 3 for the POF for case 1.)

 Some therapists mentioned they would change their primary and/or secondary treatment goals after receiving the final 2 sections of the vignette, which included the 3-month follow-up results combined with the POF. Changing treatment goals during follow-up was dependent on achieved progress and patients' motivation and needs.
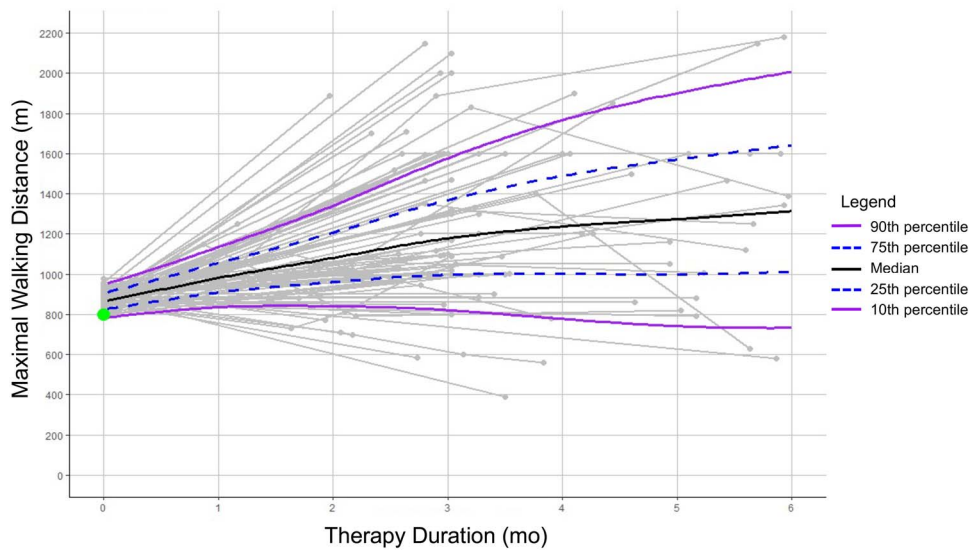
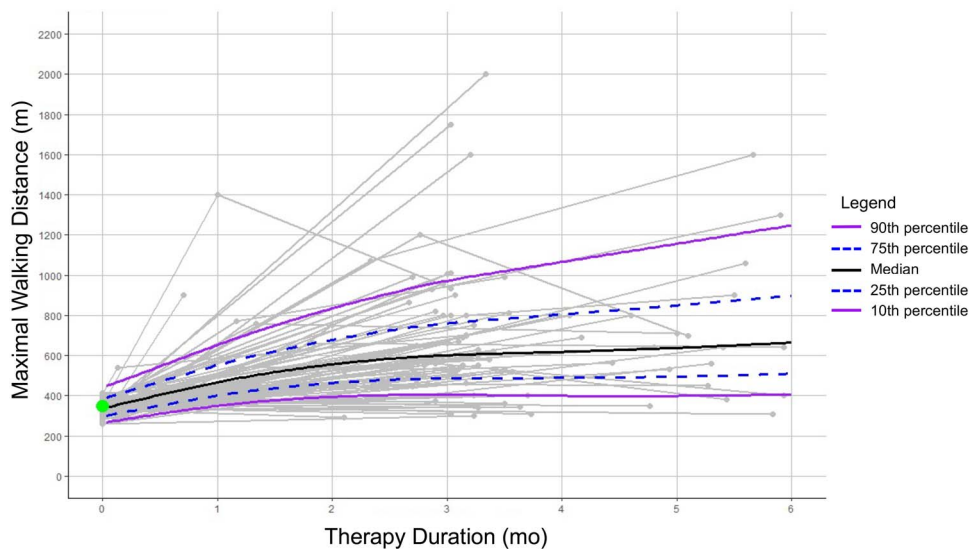**Figure 5.** Personalized outcomes forecast for case 3.

Figure 6. Personalized outcomes forecast case 2.

[Participant speaking to the imaginary vignette patient]: "What do you think of this result? Do you still prefer the 1 kilometer as treatment goal, or could we work towards another goal you are satisfied with?" [. . .] Looking at the graph, 6 months equates to roughly 500 m. "Shall we see if we can reach 600m?" —Therapist 14, case 2. (See Fig. 6 for the POF for case 2.)

Establishing and Monitoring the Treatment Plan

Physical therapists explained that the treatment plan is normally based on the standard treatment protocol as described in the guidelines, but could be influenced by treatment progress, results, motivation, and/or self-management. Regarding visitation frequency, they mentioned that they would initially see patients more frequently and decrease frequency after 1 to 3 months. Training content included treadmill walking, (outside) walking, cycling, strength training, conditional training, balance exercises, and lifestyle coaching. Homework (eg, outside walking in addition to therapy, or participation in walking groups) was also

mentioned as part of the typical care plan. Making shared decisions with the patient about visitation frequency, training content, or homework was not mentioned by therapists. Therapists indicated they would use the POF to adapt their standard treatment plan to the expected walking distance. For example, they proposed changing visitation frequency, recommending more homework, adding group therapy, or extending the duration of therapy. They suggested that POFs would not affect the content of training sessions, which typically included treadmill training.

[Participant answering whether she would change the treatment plan after seeing the personalized outcomes forecast]: "I would intensify the training. Initially I planned training twice weekly and then reducing the frequency to once per week. However, [seeing the personalized outcomes forecast] I would – at the very start – train [the patient] maybe even 3 times per week and then reduce it to twice weekly." —Participant 5, case 3. (See Fig. 4 for the POF for case 3.)

Physical therapists explained they would perform follow-up measurements every 3 months using treadmill walking tests and standard questionnaires, according to the standard protocol. Additionally, therapists pointed out they would monitor progression through conversations (ie, asking the patients' experience on therapy progression), observations during training, walking journals, clinical walking tests, and strength tests. Therapists did not mention involving the patient in decisions regarding the monitoring plan. Therapists indicated that POFs would not influence the monitoring plan.

> [Interviewer asked whether the participant would change his monitoring plan]: "No, I would measure the first time after 3 months, because at that time [the patient] has superseded his initial goal [as is depicted in the graph of this vignette patient, red]. That motivates. Then I would leave the monitoring plan like it is, just every 3 months."
> —Participant 16, case 2. (See Fig. 6 for the POF for case 2.)

Discussion

The goal of this study was to understand how the use of POFs (displaying the projected walking distance for a patient with intermittent claudication over the course of therapy) might impact physical therapists' decision-making. We found that participating physical therapists consider POFs useful for setting expectations and contextualizing expected treatment response. Furthermore, therapists believed POFs could be helpful for setting realistic primary and secondary treatment goals and to stimulate patients to achieve their goals throughout therapy. A counter-intuitive finding was that therapists thought POFs would be of less use for modifying treatment goals during follow-up sessions. Therapists deemed POFs helpful in deciding on the treatment frequency and timing, but not for intensity or type of therapy when establishing a treatment plan. The option to alter the treatment program or stop supervised exercise therapy and pursue other treatment options (eg, medical or surgical options) was also not mentioned. Finally, POFs seemed to elicit shared decision-making thoughts on the part of therapists, but many care decisions were still viewed as under the purview of the therapist.

Kittelson et al, who proposed outcomes forecasts as a practical way of increasing the personalization of physical therapy care, discussed a potential challenge to the adoption of POFs in daily practice: a poor prognosis might yield unintended negative consequences.[6] A number of therapists in our study shared that concern. Some therapists believed that a poor prognosis or poor performance could be discouraging to a patient. However, if patient prognosis or performance is poor, the POF is only 1 route by which patients might come to this realization. Another route could be the failure of patients to achieve personal goals. Thus, it might be best to encounter the understanding of a poor outcome in a setting with a physical therapist to answer questions and provide counseling and treatment options. Nevertheless, a number of therapists in our study mentioned that they considered withholding the POFs in the case of what they perceived to be a poor prognosis. On the one hand, withholding information conflicts with the patient's right to know (ie, autonomy and the right to self-determination), 1 of the fundamental principles of modern health care.[30,31] On the other hand, if POFs are viewed as a clinical tool, it could be argued that clinicians often make decisions on the use (or non-use) of various tools or modalities. Such epistemological discussions should continue as these tools are increasingly developed and deployed.

Another challenge for implementing POFs is the possible misinterpretation.[9] Problems in understanding the POF graphs may arise due to poor numeracy or statistical literacy. A fluent understanding of probabilities and statistical uncertainty would be helpful to fully grasp the prognostic displays. For example, if the prognosis shows the 75th percentile is at 1000 m, the appropriate interpretation is that 1 out of 4 similar patients achieves a walking distance of at least 1000 m. This understanding is likely to be important for setting reasonable goals and interpreting successes and failures throughout therapy. Uncertainty of the prognosis is intentionally displayed on the graphs to attempt to facilitate accurate interpretation. In this study, not all therapists seemed to understand the POFs correctly after the short explanation they received at the start of the study. Therapists who misunderstood and/or misinterpreted the POFs showed more resistance in using the tool. When implementing these forecasts in daily practice, it is essential that therapists are adequately trained in use and interpretation such that they feel prepared to communicate the information to patients. Furthermore, data science should ideally be included into courses for physical therapy schooling if these types of tools are to be effectively employed in practice.

Finally, the current and traditional use of treatment protocols might present a barrier to integration of newer tools like outcomes forecasts. The intention of the forecasts is to inform the dialogue between patient and therapist, optimize shared decision-making, and assist in personalizing care. However, our results suggest that therapists, despite guideline-based recommendations,[32] still retain elements of a more paternalistic approach, which may in turn limit the application of shared decision-making principles. This finding is not novel; others have repeatedly demonstrated the scarce application of shared decision-making in physical therapist practice.[33–35] Our results add to the existing literature to indicate that patient involvement may be limited during the treatment phase; therapists are largely stuck with a protocol-driven treatment plan. Developing information on how to adapt a protocol-based approach to accommodate shared decisions may be warranted with future work.[36] To operate as intended, POFs should be viewed as a patient-centered and participatory approach that could be applied in combination with the context of the patient's life and preferences.

Limitations

Some limitation should be taken into consideration when interpreting the results of this study. First, concerns may rise about the artificiality of vignettes. It has been questioned whether written descriptions and hypothetical behavior can reflect actual behavior.[21] However, the vignettes were based on real patients to simulate real-world scenarios as accurately as possible. The vignettes also contained intentional differences to elicit possible effects of the experimental elements. During the interviews, therapists were stimulated to read the provided patient cases as if they were real patients. All participating therapists said the vignettes accurately reflected the type of patients they might encounter in daily practice. By creating vignettes based on real patients, results are more likely to be generalizable to real cases and situations. Second,

convenience sampling was used, based on the interview location. This choice was made for practical reasons to increase participation rate. Influence of the location on the results was not expected because only Chronic CareNet therapists were eligible to participate, and they are all trained to treat patients with intermittent claudication. Third, this study lacks the patients' view on the use of POFs in therapy. Fourth, it is questionable whether our results are transferrable outside of the Netherlands, because physical therapists are specifically trained to reason from the perspective of the Dutch physical therapy guideline for patients with intermittent claudication. Finally, member checking was not performed afterwards but only continuously during the interview sessions through verbal verifying of information provided by the participants.

In this vignette-based, qualitative study, we explored the use of POFs in physical therapists' clinical reasoning process, goal-setting, and willingness to make shared decisions with patients with intermittent claudication. Results showed many opportunities for the use of POFs. Therapists thought POFs might be used to explain prognosis to the patient, motivate patients, set realistic goals, and inform treatment plans according to the predicted walking distance. There was also substantial variability across therapists within the constructed themes on how outcomes forecasts might be used. Insight into this variability creates important lessons for further improvement of the outcomes forecasts themselves and future implementation strategies. In particular, misinterpretation and misunderstanding are important factors that should be addressed to ensure outcomes forecasts are deployed as intended in daily practice.

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Ethics Approval

Declaration of interest

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Disclosures

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