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Have We Forgotten Our Patient? An Exploration of Patient Experiences After Anterior Cruciate Ligament Reconstruction

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Background: Limited information is available on the experiences of patients during rehabilitation after anterior cruciate ligament reconstruction (ACLR). **Aim:** The current study aimed to identify factors that differentiated positive and negative patient experiences during rehabilitation after ACLR. **Method and Design:** A survey-based study with an online platform was used to identify factors that differentiated positive and negative patient experiences during rehabilitation after ACLR. Seventy-two patients (age 27.8 [8.8] y) after ACLR participated. Data were analyzed and themes were identified by comparing categories and subcategories on similarity. **Main Findings:** Positive patient experiences were room for own input, supervision, attention, knowledge, honesty, and professionalism of the physiotherapist. Additionally, a varied and structured rehabilitation program, adequate facilities, and contact with other patients were identified as positive patient experiences. Negative experiences were a lack of attention, lack of professionalism of the physiotherapists, a lack of sport-specific field training, a lack of goal setting, a lack of adequate facilities, and health insurance costs. **Conclusions:** The current study identified factors that differentiated positive and negative patient experiences during rehabilitation after ACLR. These findings can help physiotherapists in understanding the patient experiences during rehabilitation after ACLR.

Keywords: survey, return to sport, patient expectations

A rupture of the anterior cruciate ligament (ACL) is a common and devastating lower-extremity injury that frequently occurs in pivoting sports, such as handball and soccer.¹ Most patients expect to return to the preinjury level of sport after an ACL reconstruction (ACLR).² The reality is vastly different; only 65% of patients return to the sport's preinjury level.³ Many studies have been conducted on patient subjective outcome measures related to return to sports (RTS) after ACLR.⁴⁻⁷ These studies often used standardized questionnaires to quantify self-reported knee function and psychological readiness for RTS.⁴⁻⁷ However, data from these standardized questionnaires do not always correlate with patient experiences during rehabilitation, which can be influenced by unfulfilled patient expectations.²

Investigating patient experiences during rehabilitation seems essential to better understand patients' needs during rehabilitation.^{8,9} This may potentially have a positive influence on RTS outcomes after ACLR. Therefore, open-ended surveys can help since this method provides meaning and understanding of the context by collecting information from the patients' perspective.¹⁰ Furthermore, this method may help physiotherapists understand patient experiences by generating context-dependent knowledge about how patients experience rehabilitation.¹¹ In other words, open-ended questions in surveys can help recognize useful concepts that are not identified when using standardized closed quantitative methods.¹¹

A positive rehabilitation environment is important for patient satisfaction, patient motivation, and less unfulfilled patient expectations.^{8,9,12} This can be achieved by supporting the patient's autonomous motivation, that is, the inherent drive toward engagement of

particular behaviors.¹² According to the self-determination theory (SDT), a patient's autonomous motivation can be supported by facilitating satisfaction of 3 psychological needs: (1) autonomy of the patient (the need of a patient to feel actions as choices), (2) competence (the need to feel effective in one's environment), and (3) relatedness (the need to feel accepted, connected, and cared by others).¹²

Earlier studies in patient experiences during rehabilitation found that being together with other patients was reported as a positive experience in patients after stroke¹³ and patients with spinal cord injuries.¹⁴ Although earlier research investigated patient experiences during rehabilitation after ACLR,¹⁵⁻¹⁷ to the best of the authors' knowledge, no studies have been conducted that primarily focused on patients' positive and negative experiences during rehabilitation after ACLR using an open-ended survey. This information can be useful for physiotherapists to create a more positive rehabilitation environment. Therefore, the current study aimed to identify factors that differentiated positive and negative patient experiences during rehabilitation after ACLR. Furthermore, the potential reasons of patients for not returning to sports were investigated.

Methods

Participants

One hundred patients after ACLR were identified from an outpatient physical therapy database. Patients were allocated to 7 physiotherapists. Patients followed the same rehabilitation protocol at the start of the rehabilitation. During the rehabilitation, the content of the rehabilitant program was adjusted based on individual test results. The first 6 weeks after the ACLR, the rehabilitation protocol focused on reducing inflammation and swelling, restoring

full knee extension and gait training. Following, neuromuscular training for quadriceps activity was added. Strengthening with low weights and high repetitions commenced during a period of 6 to 12 weeks after ACLR. Then, hypertrophy strengthening training was started at 12 weeks after ACLR. At that time, running and jumping exercises were added to the rehabilitation protocol. More sport-specific activities such as plyometrics, running, and agility drills were added during the period of 24 to 44 weeks after ACLR.^{4,7} Inclusion criteria were as follows: (1) participating in competitive, pivoting sports for at least 4 hours a week prior to the ACL injury; (2) the ambition to RTS prior to the rehabilitation; (3) age >18 years old; and (4) discharged from rehabilitation for a minimum of 6 months (18 mo after ACLR).

Of all patients, 72% responded to the invitation to participate in the study, and therefore, 72 patients (48 males and 24 females; mean age 27.8 [8.8] y) participated. Informed consent was obtained from all patients included. Demographic variables of the included patients can be found in Table 1. The study protocol was approved by the ethics committees of the University of Groningen.

Study Design

Data collection took place between December 2017 and April 2018. Patients completed open-ended questions in a structured survey, on average, 25.1 (9.9) months (range 18–36) after ACLR. The survey was web based and developed using Google Forms (Google LLC). Patients were contacted by email from the physical therapy department, which included a direct link to the open-ended, structured survey, and a password. Patients who did not respond to the email got up to 2 reminders. If patients still did not respond within 2 weeks, they were contacted by telephone. The researcher (Welling) who contacted the patients had a significant role during the rehabilitation since he monitored the patients with RTS tests. The survey included open questions regarding positive and negative experiences during the rehabilitation and potential reasons for not returning to the sport's preinjury level. Eligible patients were allowed to report multiple answers to the questions or to leave questions unanswered.

The survey included 4 questions:

- What were positive experiences during rehabilitation? (open answer)
- What were negative experiences during rehabilitation? (open answer)
- Did you return to the preinjury level in your sport? (yes/no)
- If not, what were the reasons for not returning to the preinjury level? (open answer)

Table 1 Characteristics of the Included Patients

| | |
|-------------------------|---|
| n | 72 |
| Age, y | 27.8 (8.8) |
| Sex | 48 (M), 24 (F) |
| Sport before ACL injury | Soccer (51) Handball (10) Basketball (5) Korfbal (4) Volleyball (1) |
| IKDC | 91.0 (7.8) |

Abbreviations: ACL, anterior cruciate ligament; F, females; IKDC, International Knee Documentation Committee; M, males.

Procedures

An alphanumeric identifier for each patient was used for anonymity. Themes were identified by comparing categories and subcategories on similarity. The method of analyzing data included 6 steps: (1) immersion, (2) open coding, (3) axial coding, (4) reviewing the themes, (5) defining and naming the themes, and (6) writing the report, as presented in Figure 1.¹⁸ Two authors analyzed the data independently (Welling and Lemmink) to increase the credibility of the findings.^{19,20} A disagreement between the 2 authors regarding the data analysis was followed by discussion until a consensus was reached. Additionally, answers related to patient experiences were compared between patients who RTS and patients who did not.

Results

The current study was part of a bigger longitudinal investigation in patients after ACLR. Prior to the data analysis, the responses of patients were unknown beforehand, as it was conducted as a study with open-ended questions. After finishing the data analysis and creating the themes, several theories were considered that could be related to our themes. During the data interpretation and discussion afterward, it was found that the identified themes have strong relationships with the SDT. Therefore, the identified themes were interpreted through the lens of the SDT.

A total of 31 themes were identified during step 2 (open coding) of the thematic analysis: 13 for positive patient experiences, 10 for negative patient experiences, and 8 for reasons for not returning to the preinjury level of sport. In step 3 of the thematic analysis (axial coding), the number of themes was refined to 21: 10 for positive patient experiences, 6 for negative patient experiences, and 5 for reasons for not returning to the preinjury level of sport.

Positive Experiences During Rehabilitation

The following themes were identified as positive experiences during rehabilitation: room for own input, supervision of the physiotherapist, attention of the physiotherapist, knowledge of the physiotherapist, the honesty of the physiotherapist, professionalism of the physiotherapist, a varied rehabilitation program, a structured rehabilitation program, adequate facilities, and contact with other patients (Table 2). Eighteen patients mentioned the professionalism of the physiotherapist as a positive experience. This was illustrated by the following: "The staff was very professional, and I liked the tests during the rehabilitation. The test result gave me insight into my strengths and weaknesses, and my training was tailored based on the results." Another patient mentioned, "The physiotherapist was very professional." Furthermore, 17 patients mentioned the attention of the physiotherapist as a positive experience. One patient said, "I had the feeling that there was a personal plan to get me back playing basketball. The physiotherapist really listened to me. Therefore, I really felt comfortable during the rehabilitation." Another patient said, "The physiotherapist also had an interest for me as a person besides only focusing on the injury." Additionally, a varied rehabilitation program was mentioned by 5 patients as a positive experience: "I liked the sport-specific training on the field. It gave me confidence that I could perform on the field." One patient reported the following: "Due to the sport-specific field training, my motivation increased to return to soccer. It reminded me why I trained all these months."

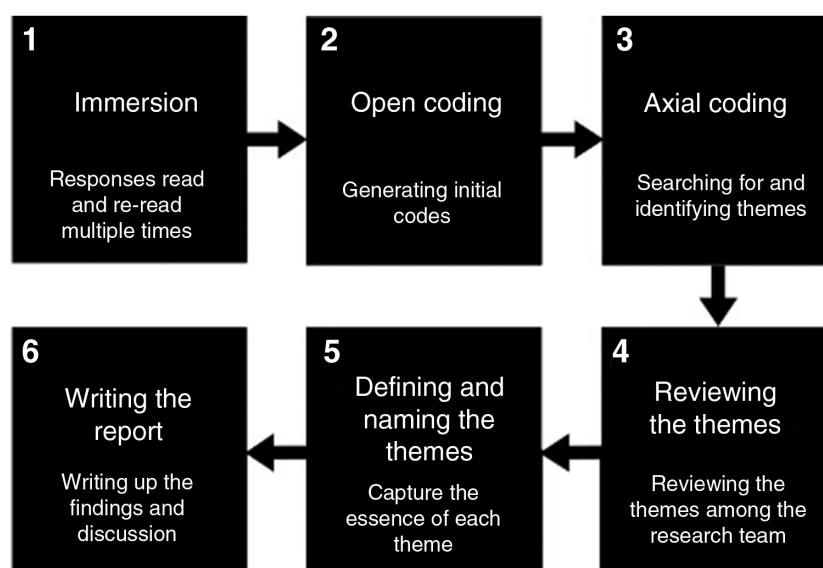


Figure 1 — Data analysis flowchart.¹⁸

Table 2 Identified Themes

| Questions | Themes | Frequencies |
|---|---|---------------|
| Positive experiences during rehabilitation | 1. Room for own input | 4/72 (5.6%) |
| | 2. Supervision of the physiotherapist | 2/72 (2.8%) |
| | 3. Attention of the physiotherapist | 17/72 (23.6%) |
| | 4. Knowledge of the physiotherapist | 8/72 (11.1%) |
| | 5. Honesty of the physiotherapist | 1/72 (1.4%) |
| | 6. Professionalism of the physiotherapist | 18/72 (25.0%) |
| | 7. Varied rehabilitation program | 4/72 (5.6%) |
| | 8. Structured rehabilitation program | 5/72 (6.9%) |
| | 9. Adequate facilities | 6/72 (8.3%) |
| | 10. Contact with other patients | 1/72 (1.4%) |
| Negative experiences during rehabilitation | 1. Lack of attention of the physiotherapist | 11/72 (15.3%) |
| | 2. Lack of professionalism of the physiotherapist | 2/72 (2.8%) |
| | 3. Lack of sport specific field training | 9/72 (12.5%) |
| | 4. Lack of goal setting | 2/72 (2.8%) |
| | 5. Lack of adequate facilities | 1/72 (1.4%) |
| | 6. Health insurance costs | 1/72 (1.4%) |
| Reasons for not returning to preinjury level of sport | 1. Fear of reinjury | 10/72 (13.9%) |
| | 2. Knee pain | 5/72 (6.9%) |
| | 3. Second anterior cruciate ligament injury | 4/72 (5.6%) |
| | 4. Lack of motivation | 2/72 (2.8%) |
| | 5. Other priorities | 1/72 (1.4%) |

Negative Experiences During Rehabilitation

In contrast, the following themes were identified as negative experiences during rehabilitation: a lack of attention of the physiotherapist, a lack of professionalism of the physiotherapist, a lack of sport-specific field training, a lack of goal setting, a lack of adequate facilities, and health insurance costs (Table 2). Eleven patients mentioned a lack of attention of the physiotherapist. This

was illustrated by the following: “I didn’t like it that the physiotherapist was treating other patients during my appointment. Therefore, the physiotherapist had less attention for me during my training session.” Another patient said, “I had 2 or 3 physiotherapists who were involved during my rehabilitation. It would be better to have one physiotherapist during the rehabilitation. Having one physiotherapist will result in a more specific personal

plan and more attention for the patient.” One patient said, “I wish they had more attention for the human being behind the injury.”

Nine patients missed sport-specific field training during their rehabilitation: “What I missed during the rehabilitation was handball specific training. I know they use a field where injured soccer players can train, but they didn’t use a handball specific training.” Another patient said, “For me, a negative experience was a lack of specific training. Most sport-specific field exercises were focused on soccer and not really on other sports. Therefore, I was nervous about returning to my sport.” One patient reported, “What I missed was sport-specific field training with more attention for the whole body instead of only focusing on the knee joint and surrounding muscles. For returning to sport, other body parts are also important. I missed the sport-specific part in the rehabilitation.”

Differences in Experiences Between Patients Who RTS and Patients Who Did Not

Fifty-five patients (76.4%) returned to the preinjury level of sport, and 17 patients (23.6%) did not. The theme lack of attention was the only theme for which patients who returned to the preinjury level of sport responded differently compared with patients who did not. Of all patients who returned to their sport, 12.7% mentioned a lack of attention as a negative experience compared with 23.5% of patients who did not return.

Themes Identified Related to Reasons for Not Returning to Preinjury Level of Sport

The following reasons were identified as themes for not returning to preinjury level of sport: fear of reinjury, knee pain, second ACL injury, a lack of motivation, and other priorities (Table 2). Ten patients mentioned fear of reinjury. One patient gave a powerful explanation for fear of reinjury he experiences: “Every time I think about my injury and how it happened, I feel fearful that it will happen again. It feels that this is not my knee anymore and that it belongs to someone else.” Another patient said, “I don’t want to risk a second ACL injury and don’t have the confidence that my knee will be stable playing soccer.” Another identified theme was knee pain, mentioned by 5 patients. This was illustrated by the following: “I always feel a little bit of pain in my knee during exercises. That’s why I stopped playing soccer.” Another patient reported something similar: “I still have pain in my knee which made me stop playing soccer.”

Discussion

This exploratory study identified factors that differentiated positive and negative patient experiences during rehabilitation for patients after ACLR. Furthermore, reasons were identified for not returning to the preinjury level of sport.

Six of the 10 identified positive experiences (room for own input, supervision of the physiotherapist, the physiotherapist’s attention, knowledge of the physiotherapist, and the physiotherapist’s honesty and professionalism) have a strong relationship with the SDT (Figure 2). A more positive rehabilitation environment may positively influence RTS outcomes after ACLR.^{12,15,21} It is advised that physiotherapists create a rehabilitation environment with sufficient patient autonomy, competence, and relatedness.¹²

Other identified positive experiences were a varied and structured rehabilitation program. More in detail, patients mentioned sport-specific field training as a positive experience. Research

suggests that sport-specific field training should be included within rehabilitation for patients with the ambition to return to pivoting sports.^{22,23} Sport-specific field training includes physiological and psychological challenges, which reflect the patients’ movement behavior when performing their sport.^{22,23} Sport-specific field training is suggested to significantly influence RTS’s psychological-related factors (more confidence and less fear).²² Additionally, research found increased psychological readiness for RTS after completing a 5-week advanced sport-specific field training program.²⁴ Therefore, to increase psychological readiness for RTS, sport-specific field training is recommended. Another advantage of sport-specific field training is that patients can share concerns, thoughts, and ideas with their peers who could increase social support and relatedness, resulting in a more positive rehabilitation environment with higher motivated patients.²⁵ This is in line with earlier findings, reporting that being together with other patients was a positive experience during rehabilitation.^{13,14} Additionally, this is in line with this study’s results, identifying contact with other patients as a positive experience during rehabilitation. It is important to notice that all patients from the current study were selected from the same outpatient physical therapy, which makes it hard to generalize the findings of the current study since health insurance systems differ between countries.

A lack of attention by the physiotherapist was identified as a negative experience during rehabilitation, which can be interpreted as a lack of patient autonomy, competence, and relatedness during rehabilitation. This might have a significant negative influence on patient motivation. Some patients mentioned that the physiotherapist treated other patients during a training session. Patients may prefer to train one-on-one in the gym under the guidance of their physiotherapist for optimal supervision and attention during rehabilitation. However, this cannot always be guaranteed. Therefore, patient education before rehabilitation is essential in the prevention of negative patient experiences. Based on our findings, it is advised that physiotherapists create groups of patients following the same rehabilitation program and can train together. Furthermore, social support within these groups of patients is suggested to help mitigate RTS anxieties.²⁵ Creating groups provides an environment where patients feel supported in sharing their experiences and feelings.²⁶ Interestingly, more patients who did not return to the preinjury level of sport mentioned a lack of attention as a negative experience compared with patients who did return. This indicates that this negative experience could significantly influence RTS success, and physiotherapists should, therefore, be educated on the importance of patient needs during rehabilitation.

Within the rehabilitation protocol, a variation of exercises is important since variation enhances the patient’s physical performance.²⁷ Variation can be created by using different training protocols for every session. This can be achieved by, for example, discussing with patients which exercises will be performed during a training session. This enhances patient autonomy, which creates an environment in which training is more challenging, increasing patient motivation.²⁸ In the current study, a lack of sport-specific field training was identified as a negative experience. Besides gym-based training, it is therefore strongly advised to include sport-specific field training for every patient with RTS ambition. Physiotherapists are encouraged to create groups of patients who are willing to return to the same sport and can, therefore, train together on the field to increase social support. For example, physiotherapists can organize an on-field sport-specific field training with a group of ACLR patients who have the ambition to RTS. It is also advised that physiotherapists and physical trainers work together to

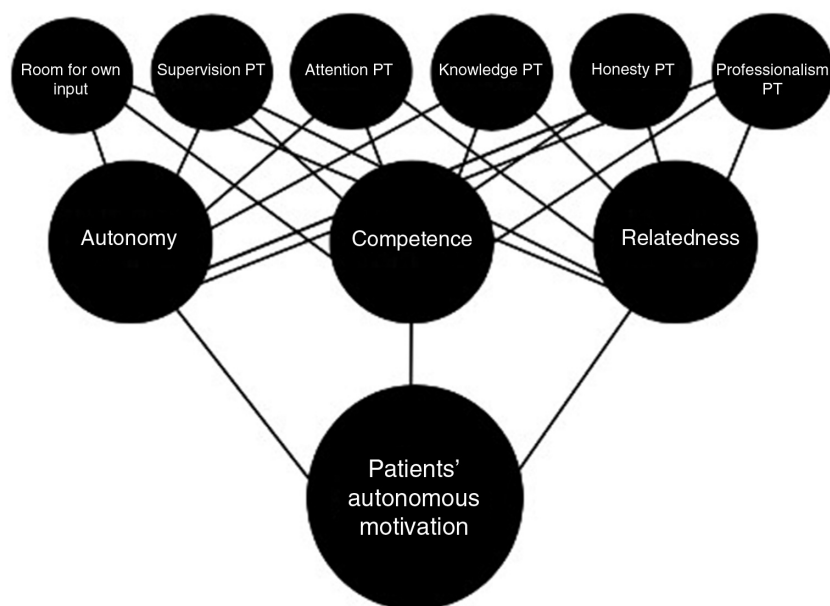


Figure 2 — Six of the 10 identified positive experiences have a strong relationship with the self-determination theory. PT = physiotherapist.

optimize the sport-specific training environment for patients after ACLR.

The RTS rates in this study were higher than reported in other studies (76.4% in the current study vs 65%²⁹). One of the reasons for these higher percentages is that patients were selected from the same outpatient physical therapy, which significantly influences the external validity of the findings since health insurance systems differ between countries, and therefore, for example, the number of supervised sessions could be different. In the current study, fear of reinjury was an identified reason for patients not returning to their preinjury level of sport. More in detail, around 60% of patients who did not RTS reported that they experience fear of reinjury. These findings are not surprising since other studies found that psychological readiness is essential for RTS after ACLR.^{3,21,30} Physical readiness for RTS does not directly indicate that a patient is psychologically ready for RTS.^{3,21,30} Therefore, it is advised to monitor psychological readiness during the rehabilitation regularly, and if necessary, targeted interventions should be included. Psychological readiness can be monitored quantitatively with patient-reported outcome measures like, for example, the Anterior Cruciate Ligament-Return to Sport after Injury questionnaire.³ Furthermore, knee pain was an identified theme as a reason for not returning to the sport's preinjury level. These findings are of concern and suggested that more attention to reducing knee pain should get attention during rehabilitation.

The most important factor in the prevention of negative patient experiences is expected outcomes.⁸ Good communication (starting preoperatively) between patients and physiotherapists results in improved patient satisfaction, patient motivation, and less unfulfilled patient expectations.^{8,9} As a result, increased patient satisfaction is suggested to increase compliance, improve treatment outcomes, and result in higher patient ratings of care quality.^{31–33} Patients expect to return to the preinjury level of sport, both preoperatively and postoperatively.^{2,6} However, the reality is vastly different. Therefore, both patients and physiotherapists need to reassess expectations for return to preinjury level of sport after ACLR since around 65% of the patients return to the preinjury level

of sport.²⁹ Cailliez et al's³³ study found that only 30% of patients after ACLR were informed about realistic outcomes. Unrealistic expectations could result in a vicious circle of reduced confidence, poor performance, and therefore frustration, decreased motivation, and decreased patient satisfaction.^{2,6,15,34} Therefore, it is suggested that good communication about realistic outcomes regarding RTS is essential to improve patient satisfaction after ACLR.²

In the current study, concepts were identified to help physiotherapists understand the patient during rehabilitation after ACLR. Current guidelines related to RTS after ACLR primarily focus on identifying mostly musculoskeletal factors (muscle strength, hop performance, etc). More recently, attention has been directed to psychological factors.^{4,6,7,35–38} There is a relation between these factors and RTS outcomes. However, the concern here is that the relationships between these isolated factors and RTS outcomes are nonlinear and represent only a part of the full picture.³⁹ Future research focusing on a broader approach is needed to understand better the complex relationships between factors related to RTS and outcome measures.³⁹ Therefore, a complex systems theory has been proposed.^{39,40} According to this theory, studying the patient's discrete variables, which can be measured quantitatively, does not automatically lead to patient behavior, patient experiences, and outcomes.⁴⁰ For example, a patient can fail in returning to the preinjury level of sport by experiencing fear of reinjury, despite a rehabilitation without any physical complaints.⁴⁰ Instead of identifying isolated factors, patients and human beings, in general, should be considered as complex biological systems in which many variables and relations (so-called “web of determinants”) influence the outcome.³⁹ The importance of the variables and relations is different for every individual patient, making RTS after ACLR an individualized and complex process, and not a static moment in time. However, complexity includes accepting some level of uncertainty.⁴¹ It is therefore advised that physiotherapists use an individual approach by creating a dynamic RTS profile for every patient with the ambition to RTS, including medical, physical, psychological, and performance-related aspects. More qualitative research is needed

to help physiotherapists find new causes and relations regarding RTS and understand patient experiences.³⁴

Methodological Considerations

The trustworthiness of the findings was strengthened by the applied methodological strategies.¹⁹ To increase the credibility of the findings, we used a triangulation process in which 2 authors analyzed the data independently. To ensure that the patients' answers were reflected within each step of the data analysis process, and to improve credibility in the data analysis, the identified themes were critically discussed. If the authors in such a process agree on the conclusions, then research outcomes have an increased credibility.²⁰ Regarding transferability, the patients were part of a very specific group of ACLR patients who were all active in pivoting sports prior the injury. Also, the patients all followed the same rehabilitation program at the same physical therapy clinic.

The current study has some limitations. First, the study is a preliminary investigation, and future research should focus on a larger sample size of patients after ACLR. Second, there is a risk for response bias since the current study's response rate was 72%. Also, one of the researchers (Welling) was both the data collector and data analyst, giving potential for researcher bias. Some patients did not respond to email, and reasons for not responding were not recorded. Some patients might have trouble recalling since there was around 1 year between the last therapy session and the time of the online survey. However, this delay is also a strength of the study since patients could process and reflect on their ACLR experiences. Also, we used open-ended questions within the survey, and we did not have the opportunity to go deeper into the patients' answers by, for example, asking more specific questions. Going deeper into the patients' answers by asking more questions is called probing questions. This is an important limitation, and more qualitative research is needed to better understand the patients' experiences during rehabilitation after ACLR by using, for example, semi-structured interviews, focus groups, or in-depth interviews. In the current study, the frequency of answers decreased in the open-ended survey, and this might indicate the patients' motivation to answer all the in survey questions. For example, more positive experiences (n=66) were mentioned compared with negative experiences (n=26). In some cases, patients had opposite experiences even though they received the same rehabilitation protocol at the same physical therapy clinic. This indicates that the personality of the physiotherapist and patient had significant influence on the study results. Finally, all participating patients followed the rehabilitation protocol at the same physical therapy clinic, and therefore, the results of the current study might not be generalizable. On the other hand, this resulted in a homogenous group of patients.

Conclusions

This study provides an overview of positive and negative patient experiences during rehabilitation after ACLR. The results imply that autonomy of the patient, competence, and relatedness during the rehabilitation is important to create a more positive rehabilitation environment. Besides gym-based training, it is strongly suggested to include sport-specific field training for every patient with RTS ambition. It is advised that physiotherapists should communicate realistic patient outcomes after ACLR to improve patient satisfaction, motivation, and to prevent unfulfilled expectations.

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