Establishing Threshold Values for the Patient Acceptable Symptom State After Anterior Cruciate Ligament Reconstruction for the Self Knee Value and the Anterior Cruciate Ligament–Return to Sport after Injury Scale

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Background: The Patient Acceptable Symptom State (PASS) has become a useful indicator, but to date, no threshold value has been defined for the Self Knee Value (SKV) and the Anterior Cruciate Ligament–Return to Sport after Injury (ALC-RSI) scale.

Purpose: To define the PASS thresholds for the SKV and ACL-RSI scale in patients 1 to 5 years after anterior cruciate ligament reconstruction (ACLR).

Study Design: Case-control study; Level of evidence, 3.

Methods: The authors conducted a retrospective analysis based on data from a prospective cohort study of patients who underwent primary ACLR. Patients <50 years completed a survey at the end of follow-up, ranging from 1 to 5 years after reconstruction. The survey covered the SKV, the ACL-RSI scale, and a PASS question for each patient-reported outcome (PRO). The PASS was calculated using the area under the receiver operating characteristic (ROC) curve and absolute postoperative PROs.

Results: A total of 890 patients answered the questionnaire, at a mean follow-up of 39.2 ± 16.8 months after primary ACLR. Among them, 85.8% achieved an acceptable symptom state based on the SKV, and 76% based on the ACL-RSI scale. The ROC curve analysis allowed determination of PASS thresholds at 71% (sensitivity, 0.86; specificity, 0.80) for the SKV and 60% (sensitivity, 0.84; specificity, 0.74) for the ACL-RSI scale. Those who achieved the PASS were younger: SKV-PASS-Y = 28.0 ± 9.7 years vs. 30.1 ± 10.3 years (P = .03) for SKV-PASS-N and 27.9 ± 9.7 years for the ACL-RSI vs. 29.6 ± 10.1 years (P = .03) for ACL-RSI-PASS-N, and had a lower body mass index for both scores with a mean BMI of 24.0 ± 3.6 vs. 24.7 ± 3.7 (P = .04) and 23.9 ± 3.6 vs. 24.7 ± 3.8 (P = .007).

Conclusion: Although the PASS has been validated in several previous studies, this is the first study to determine PASS thresholds for the SKV and ACL-RSI scale with excellent sensitivity and excellent to acceptable specificity, at 1 to 5 years after primary ACLR. This should allow practitioners to extend the use of the PASS to PROs such as the SKV and the ACL-RSI scale, and thus facilitate the assessment of large cohorts of patients in future studies.

Keywords: Patient Acceptable Symptom State; PASS; SKV; ACL-RSI; anterior cruciate ligament reconstruction; ACL

Evaluating treatment effectiveness and patient satisfaction is essential in orthopaedic surgery, leading to increasing use of patient-reported outcomes (PROs), especially after anterior cruciate ligament (ACL) reconstruction (ACLR), where patients often experience a wide array of

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symptoms. However, PROs may be difficult to interpret at times. Accordingly, the Patient Acceptable Symptom State (PASS) has emerged as an important concept after interventions such as ACLR.[25]

The Anterior Cruciate Ligament–Return to Sport after Injury (ACL-RSI) indicator is a valuable scale to evaluate psychological readiness to return to sport after ACL injury and reconstruction. Developed by Webster et al[29] in 2008, this scale includes 12 items that assess athletes' confidence in performance, fear of reinjury, risk appraisal, and emotional readiness to return to sport. After analysis, it provides a score between 0 and 100 that can guide return-to-play decisions. Numerous studies have demonstrated its reliability and validity in assessing psychological readiness for return to sport among participants who underwent ACLR.[1,17,28]

The Self Knee Value (SKV)[15] is a metric derived from the Knee injury and Osteoarthritis Outcome Score (KOOS) that packs the comprehensive assessment of the KOOS into a single value. It directly quantifies patients' perceived health status and functional ability in the reconstructed knee, thereby simplifying interpretation and enhancing clinical efficacy.

In this context, the PASS could be helpful because it reflects the clinical condition that is perceived by patients as associated with adequate recovery and tolerable symptoms.[11] The PASS can be calculated and/or used for any PROs and has already been formulated by previous studies for the International Knee Documentation Committee Subjective Knee Form (IKDC-SKF) and the KOOS.[16] However, in our daily practice, we usually complete the patient evaluation with the SKV and the ACL-RSI scale, for which no PASS thresholds are available to date.

The primary objective of the present study was to establish the PASS values for the French validated versions of the SKV[15] and ACL-RSI scale,[1] in patients who underwent primary ACLR. The secondary objective was to identify the factors associated with an acceptable level of knee function after ACLR. We hypothesized that the PASS cutoff for the French version of the SKV and ACL-RSI scale in these patients could be identified using an anchor-based approach.

METHODS

Study Design and Participants

This cohort study was conducted at the Sports Clinic of Bordeaux-Mérignac (France) between January 2019 and January 2023. Informed consent was obtained from each patient before inclusion in the present study and ethical approval was obtained from the appropriate ethics committee (IRB No. CERC-VS-2024-08-3).

The patients included were between 15 and 50 years of age. All received primary ACLR using hamstring tendon autografts and were included between 1 and 5 years after surgery. The exclusion criteria were as follows: secondary ACLR, a graft other than hamstring tendon autograft, bilateral ACL lesion, secondary surgery on the same knee during follow-up, and refusal to participate.

We chose to only include participants <50 years of age, as previously suggested in the literature,[16] to avoid a significant decrease in the threshold values. Older patients are known to have a lower functional requirement, as noted by Smith,[22] and even more so at 5 years after surgery.

Instruments

Demographic data were collected retrospectively for each patient from their medical records. PRO measures, sex, body mass index (BMI), Tegner Activity Scale (TAS) score, and age, comparing patients >40 years of age with younger ones, as suggested in the literature,[22,23] were used in supplementary analyses.

In February 2024, a questionnaire was mailed to potential participants, including the SKV, ACL-RSI scale, and corresponding PASS questions. Participants were asked about subsequent surgery on the index knee. This procedure was followed by 2 telephone calls to maximize response rate.

The ACL-RSI scale is a unidimensional 12-item scale (Appendix A), developed in 2008 by Webster et al[29] and whose French version was validated in 2015.[1] It allows evaluation of psychological readiness to return to sport after ACL injury. It measures 3 types of response believed to be associated with return to sport after athletic injury: emotions (5 items), confidence in performance (5 items), and risk appraisal (2 items). Its reliability is acceptable (Cronbach alpha = 0.92), and it is very efficient in determining discrepancies between patients who gave up sport and those who returned or were trying to return to sport ($P < .001$).[29]

The ACL-RSI PASS question was "Considering your current involvement in sports activities, your level of pain, your fear of new injury and also possible limitations to your activity and participation in sports events, do you consider the current activity level of your knee satisfactory?"

The SKV is a very simple subjective score that allows assessment of the knee function in a wide range of pathologies. The French version was validated in 2019 in a prospective pilot study by Marot et al[15] and more recently in English by Plachel et al,[20] with a very high correlation to other knee scores such as the KOOS ($R = 0.758$; $P < .05$), IKDC-SKF ($R = 0.802$; $P < .05$), and Western Ontario

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and McMaster Universities Osteoarthritis Index or Lysholm-Tegner score. To avoid confusion, it is important to note that the French "Self Knee Value"[15] is equivalent to the "Subjective Knee Value" in English.[20] It corresponds to a single question: "How do you rate your knee on the day of the examination, comparing to a normal knee, in percentage?" This score relies on a short form, which avoids missing data in comparison with multiple-item scores such as the KOOS, without compromising accuracy in evaluating an individual's knee function.[20]

The SKV PASS question was as follows: "Taking into account all your activity in your daily life, your level of pain, and also possible limitations to your activity and participation in sports events, do you consider the current state of your knee satisfactory?"[14,16,25,27]

The PASS was defined as a "yes" (SKV PASS-Y or ACL-RSI PASS-Y) if it was achieved or "no" (SKV PASS-N or ACL-RSI PASS-N) if it was not. Questions were translated into French and a pilot test was performed for the questionnaire in our 20 first patients to evaluate its clarity and patients' perception of the time needed to answer before it was distributed to all participants included in this study.

Surgical Technique and Rehabilitation

All participants underwent ACLR in the same medical center, performed by 2 surgeons (N.G. and N.B.) using the same surgical procedure: ACLR under arthroscopy, with 4-strand semitendinosus autograft using outside-in tibial tunnel drilling and adjustable suspensory femoral and tibial fixation devices with inside-out technique through the anteromedial portal. Additional meniscal lesions were sutured as much as possible. An identical postoperative physical therapy protocol was given to all patients.

Outcome Measures

The primary outcome was the results obtained at the longest follow-up for the SKV, the ACL-RSI scale, and the responses to corresponding PASS questions.

Secondary outcomes included sex, BMI, TAS score, and age at the time of surgery.

Statistical Analysis

Data were processed using descriptive statistics. Continuous variables are described using mean and standard deviation. Categorical variables are presented with total count and percentage. Chi-square and Fisher exact tests were used to test for differences between categorical variables, and the Kruskal-Wallis test was used for continuous variables.

The PASS was determined using a receiver operating characteristic (ROC) curve analysis[11,14,16,25] to define cutoff points for each PRO among patients who considered their state satisfactory. A ROC curve is a graph built with sensitivity on the vertical axis and 1 – specificity on the horizontal axis. Using the area under the curve (AUC) and the Youden index, we determined the best threshold value for each PRO (with highest sensitivity and specificity), corresponding to the nearest point to the upper left-hand corner of the ROC curve. An AUC value of 0.7 to 0.8 was regarded as acceptable, and an AUC value of 0.8 to 0.9 was regarded as excellent.

An alpha level of $P < .05$ was considered statistically significant for each statistical analysis. All analyses were performed using IBM SPSS software for Windows 11 (Version 27; IBM Corp).

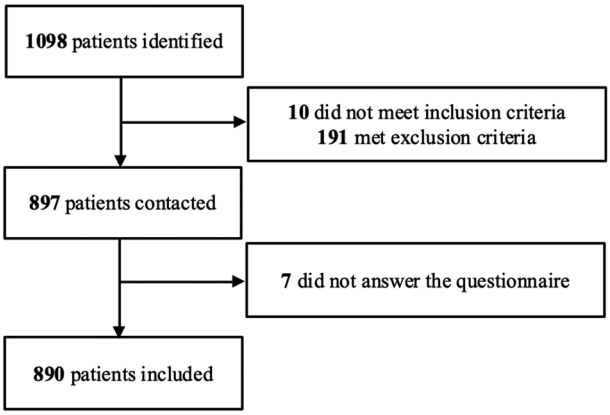

Figure 1. Study flowchart.

RESULTS

Inclusion of Patients and Patient Characteristics

At the end of the inclusion period, data from 1098 patients were available. Ten patients were excluded because they did not meet the inclusion criteria. A total of 191 patients were excluded because they met exclusion criteria: 155 underwent a second surgery and a further group of 36 patients underwent ACL revisions. Seven patients were excluded from further analyses because they did not answer the questionnaire.

Eventually 890 patients were included (Figure 1). Among them, 338 were female and 62% were male. The mean age was 28.3 ± 9.8 years (range, 15-50 years), and 129 patients were >40 years of age. We obtained a follow-up rate of 81% (890/1098) and a response rate of 99% (890/897). Demographic data and PRO results are shown in Table 1.

Patient Acceptable Symptom State

Analysis of the curve indicated that the optimal thresholds were 71% (sensitivity, 0.86; specificity, 0.80) for the SKV PASS and 60% (sensitivity, 0.84; specificity, 0.74) for the ACL-RSI PASS (Figure 2).

Overall, 85.8% of the patients reported an acceptable symptom state on the SKV and 76% on the ACL-RSI scale, 1 to 5 years after primary ACLR.

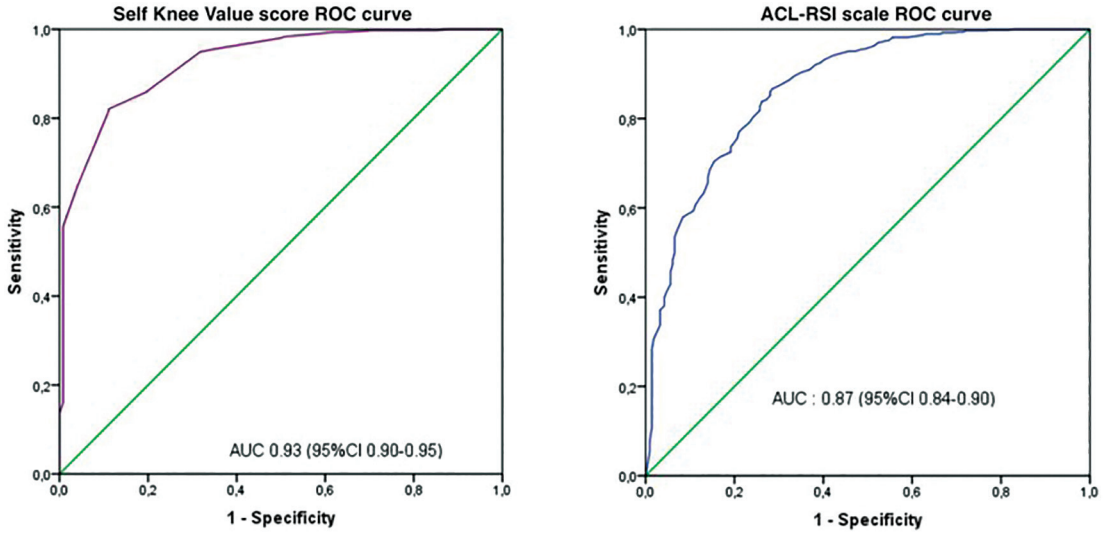

Figure 2. Optimal Self Knee Value score (left receiver operating characteristic [ROC] curve) and optimal Anterior Cruciate Ligament–Return to Sport after Injury (ACL-RSI) scale (right ROC curve) thresholds in patients, 1 to 5 years after anterior cruciate ligament reconstruction. AUC, area under the curve.

TABLE 1
Characteristics of the Study Population[a]

Characteristic	Value
No. of patients	890
Sex, n (%)	
Male	552 (62)
Female	338 (38)
Age at surgery, y	28.3 ± 9.8 (15-50)
No. of patients >40 y	129
BMI, kg/m^2	24.12 ± 3.65 (15.8-39.7)
Follow-up, mo	39.2 ± 16.8 (12-74)
Preoperative Tegner score	7.04 ± 1.4 (1-10)
SKV at last follow-up, %	81.1 ± 18.1 (0-100)
ACL-RSI score at last follow-up, %	69.9 ± 23.7 (0-100)

[a]Data are given as mean ± SD (range) unless otherwise indicated. ACL-RSI, Anterior Cruciate Ligament–Return to Sport after Injury; BMI, body mass index; SKV, Single Knee Value.

TABLE 2
Comparison of Characteristics Between Patients Who Achieved the PASS and Those Who Did Not for the SKV[a]

Variable	SKV PASS-Y	SKV PASS-N	*P*
Total patients	764 (85.8)	126 (14.2)	
Sex			
Female	288 (37.7)	50 (39.7)	.67
Male	476 (62.3)	76 (60.3)	
Age	28.0 ± 9.7	30.1 ± 10.3	**.03**
<40 y	663 (86.8)	98 (77.8)	**.008**
>40 y	101 (13.2)	28 (22.2)	
BMI, kg/m^2	24.0 ± 3.6	24.7 ± 3.7	**.04**
TAS score	7.0 ± 1.4	6.9 ± 1.4	.65

[a]Data are given as n (%) or mean ± SD (range) unless otherwise indicated. Bold *P* values indicate statistical significance. BMI, body mass index; PASS, Patient Acceptable Symptom State; PASS-N, did not achieve PASS; PASS-Y, did achieve PASS; SKV, Single Knee Value; TAS, Tegner Activity Scale.

A comparison between patients who achieved the PASS and those who did not, for preoperative variables (Tables 2 and 3), revealed that patients who achieved the PASS were younger and had a lower BMI, for both the SKV and ACL-RSI scale.

Patients who achieved the PASS for the SKV had a mean age of 28.0 ± 9.7 years versus 30.1 ± 10.3 years (P = .03) for those who did not, and those who achieved the PASS for the ACL-RSI scale had a mean age of 27.9 ± 9.7 years versus 29.6 ± 10.1 years (P = .03) for those who did not. This was particularly significant for patients >40 years of age who had decreased odds of achieving the PASS for both scores (P = .008 for SKV and P = .014 for ACL-RSI scale). We calculated subgroup thresholds: SKV and ACL-RSI cutoff points for patients >40 years of age were 54% (sensitivity, 0.88; specificity, 0.85) and 57% (sensitivity, 0.91; specificity, 0.77), respectively, and for patients <40 years they were 73% (sensitivity, 0.86; specificity, 0.82) and 61% (sensitivity, 0.82; specificity, 0.74), respectively.

We also noticed that patients who succeeded in achieving the PASS had a lower BMI for SKV and ACL-RSI with a mean BMI of 24.0 ± 3.6 versus 24.7 ± 3.7 (P = .04) and 23.9 ± 3.6 versus 24.7 ± 3.8 (P = .007), respectively.

No statistical difference was found between PASS-Y and PASS-N in terms of sex or activity levels.

TABLE 3
Comparison of Demographics Between Patients Who Achieved the PASS and Those Who Did Not for the ACL-RSI Scale[a]

Variable	ACL-RSI PASS-Y	ACL-RSI PASS-N	*P*
Total patients	676	214	
Sex			
Female	264 (39.1)	74 (34.6)	.24
Male	412 (60.9)	140 (65.4)	
Age	27.9 ± 9.7	29.6 ± 10.1	**.03**
<40 y	589 (87.1)	172 (80.4)	**.014**
>40 y	87 (12.9)	42 (19.6)	
BMI, kg/m^2	23.9 ± 3.6	24.7 ± 3.8	**.007**
TAS score	7.0 ± 1.4	7.1 ± 1.3	.56

[a]Data are given as n (%) or mean ± SD (range) unless otherwise indicated. Bold *P* values indicate statistical significance. ACL-RSI, Anterior Cruciate Ligament–Return to Sport after Injury; BMI, body mass index; PASS, Patient Acceptable Symptom State; PASS-N, did not achieve PASS; PASS-Y, did achieve PASS; TAS, Tegner Activity Scale.

DISCUSSION

The results of this study show that reaching the threshold values of 71% for the SKV and 60% for the ACL-RSI scale corresponds to the achievement of the acceptable symptom state in patients <50 years who underwent a primary ACLR, using hamstring tendon autograft, with a mean follow-up of 39.2 ± 16.8 months (3.3 ± 1.4 years). In the last follow-up, 118 of 890 patients had achieved the 5-year follow-up milestone. This accounts for slightly less than one-fifth of the patients, due to the effect of the COVID-19 pandemic on both patient health and our surgical activities.

Two factors were associated with the achievement of the PASS: patient age at the time of surgery and BMI. The younger the patients were and the lower their BMI was, the more they answered "yes" to PASS for SKV and the ACL-RSI scale. For patients <40 years, the SKV and ACL-RSI thresholds were 73% (sensitivity, 0.86; specificity, 0.82) and 61% (sensitivity, 0.82; specificity, 0.74), respectively, and for patients >40 years, they were 54% (sensitivity, 0.88; specificity, 0.85) and 57% (sensitivity, 0.91; specificity, 0.77), respectively.

Our study population was young (mean age, 28.3 ± 9.8 years), prone to sports (mean TAS score, 7.04 ± 1.4), and of normal weight (mean BMI, 24.12 ± 3.65 kg/m^2), with a majority of male participants (62%), which is consistent with the available literature on ACLR.[30] For example, in the study by Muller et al,[16] the population was also young (mean, 26.1 ± 9.9 years) but with a larger proportion of female patients (53.7%; 139/259), and they chose to include reinjured patients who had increased odds of not achieving the PASS (40.7% vs 12.6%; $P < .001$). Similar characteristics can be seen in Vega et al,[27] a study based on the Orthopaedic Minimal Data Set Episode of Care longitudinal cohort population, which was young (26.2 ± 5.6 years), predominantly female (53.3%; 160/300), and overweight (BMI, 26.3 ± 5.6 kg/m^2). Female patients are known to achieve PASS status in significantly lower proportions than male patients,[16] which could create a bias in our cohort, but results in the literature are contradictory and our analysis did not reveal a correlation between sex and PASS status. Regarding BMI, we hypothesize that patients with a lower BMI are more active and have a higher functional demand, which could explain the significant improvement observed after surgery. However, we did not find a significant difference in TAS scores between the PASS-Y and PASS-N groups in our study.

The questionnaire consisted of 2 PROs: the SKV and the ACL-RSI scale. The SKV is known to be highly correlated with the KOOS ($R = 0.758$; $P < .05$) and the IKDC-SKF ($R = 0.802$; $P < .05$),[20] but it has not yet been specifically studied in a population that underwent ACLR, for which values for the PASS threshold have not been determined. In our cohort, the mean SKV result was 81.1% ± 18.1% at a mean follow-up of 3.3 years.

The ACL-RSI scale is increasingly being used for psychological assessment before returning to sport after ACLR, in addition to physical examination. We obtained a mean ACL-RSI score of 69.9% ± 23.7% at the last follow-up. This scale has often been used with arbitrary thresholds, which is why some studies have tried to improve this lack of clinical relevance by determining the minimal important change[21] or the substantial clinical benefit,[9] but, to our knowledge, no previous study has defined the PASS value for this scale.

In our findings, both scores were very specific in predicting the PASS result with a difference in values of 33.8 ($P < .001$) between ACL-RSI PASS-Y (mean, 78.0% ± 19.9%) and ACL-RSI PASS-N (mean value 44.2% ± 23.6%), and 34.2 ($P < .001$) between SKV PASS-Y (mean, 86.0% ± 11.7%) and SKV PASS-N (mean, 51.8% ± 21.8%).

Even if the specificity calculated for the ACL-RSI PASS threshold was not excellent (0.74), this value widely varies in the literature between different PROs. Muller et al[16] calculated the PASS cutoff levels for the IKDC-SKF and KOOS subscales, and their specificity varied from 0.67 for the KOOS Symptom subscale to 0.96 for the IKDC-SKF at a mean follow-up of 3.4 years after ACLR. Furthermore, in 2019 Vega et al[27] already noticed a lack of specificity of the PASS for the KOOS Quality of Life (65.7%; 95% CI, 47.8%-80.9%) and KOOS Pain (43.4%; 95% CI, 29.8%-57.7%) subscales, alone or in combination (47.1%; 95% CI, 35.1%-59.5%), corresponding to a large number of false-positives results. In our case, with a specificity of 0.74 for the ACL-RSI PASS threshold, approximately 26 participants reported to be satisfied with their knee state 39.2 months after surgery, without experiencing a clinically successful ACLR. Our specificity remained "acceptable" regarding the AUC, and as reported by Vega et al[27] in their study: "the ideal screening tool is one that maximizes both sensitivity and specificity, however no such tool exists."

Because of the context in which it was originally developed, the PASS is clinically more relevant than an absolute PRO result.[12] It corresponds to a quantitative measure that gives a qualitative assessment of patients' feelings. It was developed by rheumatologists to assess the clinical

effect of medical intervention on inflammatory joint diseases.[3,25] Quickly, the PASS was also used by orthopaedic surgeons to improve the interpretation of PROs and evaluate patient satisfaction after interventions such as total hip arthroplasty, total (and unicompartmental) knee arthroplasty,[2,4,5,7,10,24] or ACLR, our main focus of interest in this study. After determining a PASS threshold for a PRO, it allows practicians to predict the rate of patients' response to a PASS question. For example, in the literature several studies[6,8,18] use the PASS values for the IKDC-SKF and/or the KOOS determined by Muller et al[16] to evaluate patient satisfaction after ACLR, with a high sensitivity in detecting a successful intervention. Its specificity differs in the literature, though: Muller et al[16] determined a specificity of 96% on the IKDC-SKF at 1 to 5 years after ACLR, whereas Piamthipmanas et al[19] calculated a specificity of 82% on the Thai IKDC-SKF at 3.3 ± 1.1 years of follow-up. In 2019, Vega et al[27] reached only 47.1% (nearly 53% of false-positive results), a score limiting the ability to identify an unsuccessful intervention, 1 year after ACLR.

Some factors are known to influence the achievement of the PASS status, but they have to be considered carefully, because most of them have only been studied as secondary outcomes in the literature. Hamrin Senorski et al[8] and Muller et al[16] reported increased odds of achieving PASS status in male patients, whereas Cristiani et al[6] reported better results for female patients. Our multivariable analysis did not highlight any significant difference of achieving the PASS in terms of sex ratio.

Previous studies concur on the need to adapt the threshold value to the age of patients,[6,8,13,22,23] but available results are inconsistent: some studies found that older patients are more likely to achieve PASS status (mostly >40 years of age).[6,13,23] This could be explained by a decrease of expectations and perspectives when getting older. Other studies revealed that younger patients had better odds of achieving the PASS,[8,27] and our results support that, with a lower mean age in PASS-Y groups (28.0 ± 9.7 years vs 30.1 ± 10.3 [P = .03] and 27.9 ± 9.7 vs 29.6 ± 10.1 [P = .03], respectively, for SKV and ACL-RSI scale). In supplementary analyses, we determined subgroup cutoff levels based on age, with, as expected, lower threshold values of 54% (sensitivity, 0.88; specificity, 0.85) for the SKV and 57% (sensitivity, 0.91; specificity, 0.77) for ACL-RSI scale compared with 73% (sensitivity, 0.86; specificity, 0.82) and 61% (sensitivity, 0.82; specificity, 0.74), respectively, for younger patients. These thresholds must be interpreted with caution, however, because the older subgroup included only 129 patients, and as already noted, determining these thresholds was not the main objective of this work.

Patients with a higher level of activity are reported to have increased odds[8] to achieve the PASS, but our analysis failed to find this association (P = .65 for the SKV and P = .56 for ACL-RSI scale), despite a large number of patients in the cohort. Regarding techniques used for the graft, studies show better PRO subsection results[6,8,19] for hamstring tendon autograft compared with patellar tendon autograft. Our study population included only hamstring tendon autograft, which makes our PASS cutoff levels really specific to this graft technique.

The PASS could be helpful as a screening tool in a large cohort. In 2022, Persson et al[18] used the PASS in an ingenious way in a registry cohort, 10 years after ACL injury, to compare patients' outcomes between ACLR and nonsurgical treatment. Their study suggested that a greater proportion of patients achieved the KOOS PASS after surgical treatment, even if some bias could occur, because patients who did not undergo surgery were only volunteers, and they excluded patients who crossed over from nonsurgical treatment to ACLR instead of considering them as nonsurgical treatment failures.

Overall, the main advantage of the PASS is that practitioners could use it exclusively in combination with postoperative PRO results to determine if the patient feels a significant improvement in their function, without knowing the preoperative status.[19]

To our knowledge, this study is the first to define PASS thresholds for the SKV and ACL-RSI score. The strengths of this study include its large sample size, the rather extended duration of follow-up, and, most importantly, a high response rate (only 1% lost to follow-up).

Our study has several limitations. First, the patient population, included from only 1 center, may be affected by a sample bias that could limit the generalization of findings. Furthermore, the method used to determine the PASS threshold, that is, through an anchor question in association with PRO measures and ROC analysis used in this study, has already been proven in the literature, but a recent technique using predictive modeling appears to provide more accurate thresholds.[26] Another possible limitation highlighted by Vega et al[27] in their study is the lack of preoperative PASS status, as it is possible that some patients already achieved PASS before surgery (ie, between consultation and ACLR). This problem resides more in the management of the patient: in our center, patients with poor functional requirements are first treated functionally with rehabilitation and then reassessed a few months later to search for a discomfort or an activity restriction, thereby establishing the indication for surgery if any of these features are confirmed. If the patient is satisfied before the second appointment, no surgical indication is retained.

CONCLUSION

In this study, we estimated the PASS cutoff values of 2 main PROs used in ACLR follow-up. A 71% threshold was found for the SKV, and for the ACL-RSI scale the threshold was 60%, with excellent sensitivity (0.86 and 0.84, respectively) and excellent to acceptable specificity (0.80 and 0.74, respectively), at a mean of 39.2 ± 16.8 months after primary ACLR.

A total of 85.8% of patients reported an acceptable symptom state using the SKV and 76% using the ACL-RSI scale. Higher patient age and BMI were 2 factors that consistently reduced the odds of achieving a PASS for both scores, 1 to 5 years after primary ACLR.

To our knowledge, this is the first study to define PASS values for the SKV and the ACL-RSI scale. We hope this work will help further studies to analyze and understand PRO results and to improve the management of patients by screening those who need an additional procedure.

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Data Accessibility Statement

All data sets related to this study are available on reasonable request from the corresponding author, Nicolas Bouguennec.

Supplemental Material for this article is available at https://journals.sagepub.com/doi/full/10.1177/23259671251343073#supplementary-materials.

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