Original Article

# Defining the Patient Acceptable Symptom State Using the Forgotten Joint Score 12 After Hip Arthroscopy

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**Purpose:** To contextualize the Forgotten Joint Score (FJS-12) by identifying a patient acceptable symptomatic state (PASS) threshold for patients undergoing hip arthroscopy and to investigate factors which correlated with postoperative FJS-12 score. **Methods:** All patients who underwent hip arthroscopy for femoroacetabular impingement (FAI) under the care of a single surgeon between January 2018 and November 2019 were prospectively identified and included. Exclusion criteria were Tönnis classification grade 2 or greater. Data (including FJS-12, EuroQol-5 Dimension-5L [EQ-5D-5L], visual analog scale (VAS), and 12-item International Hip Outcome Tool (iHOT-12) scores) were available before surgery and at a minimum of 1 year after surgery. PASS was calculated using an anchor-based approach and receiver operator characteristic curve analysis. Pearson correlation analysis was used to correlate preoperative and postoperative factors with postoperative FJS-12 score. **Results:** Seventy-seven patients (54 female, 23 male; mean age 30.3 years [standard deviation {SD} 8.2]) were included. Linked longitudinal follow-up data were available for 65 patients (84%) at a mean of 23.8 months (SD 6.4). Six patients required reoperation. Mean postoperative FJS-12 score was 46.5 (SD 33.1) and mean change in score was 27.2 (SD 30.6, $P < .001$). The PASS threshold for the FJS-12 was 38.5 (sensitivity 80%, specificity 88%), and the area under the curve was 0.852 (95% confidence interval 0.752-0.951). Overall, 53.8% of patients achieved this score. Postoperative FJS-12 score has moderate correlations with preoperative EQ-5D-5L, iHOT-12, and FJS-12 scores, and strong correlations with EQ-5D-5L, iHOT-12 and VAS scores after surgery. **Conclusions:** We report a postoperative PASS threshold of 38.5 points for the FJS-12 after hip arthroscopy for FAI in a United Kingdom population. This value can act as a quantifiable target for clinicians using the FJS-12 to monitor patient outcomes in practice. FJS-12 has strong correlations with EQ-5D-5L, iHOT-12, and VAS at a minimum 12 months after surgery. **Level of Evidence:** Level IV, case series 4.

Hip arthroscopy is an effective treatment for femoroacetabular impingement (FAI) and labral pathology,[1,2] and a number of patient-reported outcome measures (PROMs) have been used to quantify the outcome of this treatment.[3-7] The concept of joint awareness is well suited for capturing reliable outcomes for young, active patients undergoing hip arthroscopy, and this is particularly true for high-functioning patients.[8] The Forgotten Joint Score (FJS-12) is a well-established tool for the assessment of joint awareness for patients undergoing total hip and knee arthroplasty, and it is has been shown to have the capability to distinguish between high performing patients, which previous described PROMs may have struggled with.[9] It is also being recognized as a useful tool for an athletic population, secondary to its ability to distinguish been good, very good, and excellent outcomes and, hence, is less affected by a ceiling effect. In addition, it captures what is most important to the patient compared with surgeon-defined outcomes. It has now been used in a

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number of sports surgery studies, including in the field of hip arthroscopy, where it has been shown to be a valid tool with minimal ceiling effect[8,10] and in ACL repair.[11,12]

Patient-reported outcome scores are very useful research tools to quantify treatment success. These are typically reported on a linear scale with an individual's score graded against upper and lower boundaries; however, it can be challenging to meaningfully interpret with regard to whether a "good" outcome has been achieved. Indeed, postoperative outcomes are subjective and often closely tied to patients' own expectations from the surgery, which are varied and difficult to quantify, although attempts have recently been made in the literature.[13] Postoperative satisfaction is a global measure of success not exclusively tied to symptomatology or function after an operation, and in the setting of arthroplasty it has been shown that patients' expectations and experiences of the healthcare process are just as important as achieving pain relief in predicting satisfaction after surgery.[14] Patient selection for surgery also plays a key role in outcomes and will often also take into account these less quantitative variables.[15]

A postoperative outcome score threshold above which a patient is considered to have had a satisfactory outcome is known as the patient acceptable symptomatic state (PASS).[16] This is the point on the scoring system that is associated with meeting outcome success criteria as defined by patient's acceptability of the resultant symptom state, and it has been used widely in both total hip and knee arthroplasty[17-19] and in hip arthroscopy.[20-23] The PASS is a particularly useful measure as it contextualizes whether the treatment has been successful in a single postoperative evaluation. The minimally clinical important difference (MCID) is another helpful statistical description that is used to interpret whether a meaningful change has been achieved in a PROM. It is the minimum value in score points on a given scale which corresponds to a change in symptomatology that the patient considers important.[24] Despite the increasing use of the FJS-12 in hip arthroscopy, psychometric properties such as the PASS and MCID have yet to be determined.

It is also useful to understand the baseline presentation factors that are associated with achieving a PASS postoperatively to help counsel patients prior to surgery. Preoperative predictors of success in hip arthroscopy have previously been reported using the 12 item International Hip Outcome Tool (iHOT-12)[25] and the 33 item International Hip Outcome Tool (iHOT-33).[26] In a recent scoping review of patient-related negative predictive factors, Kuroda *et al* reported increasing age and the presence of radiographic osteoarthritis as the strongest predictors of a poorer outcome following hip arthroscopy.[27] Results from the Danish Hip Arthroscopy Registry of 2054 hip arthroscopy procedures reported higher degrees of femoral and acetabular chondral injury predicted inferior Copenhagen Hip and Knee Outcome Scores, although the presence of low grade chondral defects are often challenging to determine preoperatively.[7,28] Beck et al reported larger preoperative alpha angles were predictive of achieving the PASS threshold on a visual analog scale of satisfaction.[29]

The purpose of this study was to contextualize the Forgotten Joint Score (FJS-12) by identifying a patient acceptable symptomatic state (PASS) threshold for patients undergoing hip arthroscopy, and to investigate factors which correlated with postoperative FJS-12 score. We hypothesized that our analysis would provide an FJS-12 threshold score that was sensitive and specific for establishing whether patients have achieved an acceptable symptomatic state postoperatively.

## Methods

All patients undergoing primary hip arthroscopy for FAI with labral tear by a single surgeon between January 2018 and November 2019 were prospectively collected and retrospectively analyzed. Exclusion criteria included any patient with Tönnis classification grade 2 or greater. Patients were diagnosed with FAI by a single fellowship-trained hip surgeon (P.G) using clinical history, examination, plain radiographs and magnetic resonance arthrogram if appropriate and had failed a trial of non-operative treatment including analgesia and physiotherapy. Intra-articular injections were used to confirm the origin of symptoms in cases of doubt. Demographic data included age, gender, body mass index (BMI), and Scottish Index of Multiple Deprivation (SIMD) vingtile ranking (social deprivation index).[30] Patients completed preoperative FJS-12,[8,10] iHOT-12,[31] Tegner and EQ-5D-5L[32] questionnaires 2 weeks before surgery at the pre-assessment clinic and at a minimum of one year postoperatively. Plain anteroposterior radiographs were used to assess for cam and/or pincer lesions as well as to calculate the lateral center edge angle (LCEA), and assess Tönnis classification. Patients self-reported the number of months for which they had experienced symptoms prior to surgery. Satisfaction data were also collected at a minimum of one year postoperatively. Patients who did not respond to postal questionnaires were telephoned by a member of the research team.

### Surgical Technique

The supine distractor was used for patient positioning. Image intensifier was used to confirm joint distraction. Superolateral and anterior portals were used to access the hip joint. These were expanded with sequential dilators to allow instrument access. The paralabral recess was opened and a high-speed burr was used to

resect the pincer lesion of the acetabular rim and enable a flat surface for anchor placement. If the labrum was repairable, Stryker Cinchlock (Stryker, Mahwah, NJ, USA) anchors were used in a vertical mattress fashion with Cobraid sutures to repair the labrum. The traction was then released and attention was turned to the femoral head/neck junction. If a cam lesion was identified it was resected using a high-speed burr. Flexion was used to reach the anterior most aspects of the neck. An on-table impingement maneuver was performed to assess clearance of the femoral neck from the acetabulum under direct vision. Final orthogonal x-ray views were obtained to ensure adequate bony resection. The capsule was not repaired.

## Rehabilitation

Rehabilitation was divided into four phases. In phase one (0 − 10 days postoperatively), focus was on managing pain and allowing flat-footed weightbearing with the assistance of crutches. No range of movement restrictions are enforced for those undergoing labral debridement however, those receiving repair are restricted from hip flexion for four weeks and no hip flexion and internal rotation for 12 weeks. In phase two (10 days to 4 weeks), patients can disregard their crutches and begin range of movement, muscle recruitment and gait patterning. In phase 3 (>4 weeks), progression of rehabilitation through this stage is governed by having a pain-free and non-irritable hip, a normal gait pattern, optimal lower limb motor control, range of movement, strength and proprioception to allow full recovery. Labral repairs can now begin flexing exercises. Phase four (>12 weeks) allows return to sport. Running typically commences around eight weeks and non-contact and contact sports at 3-4 months depending on the surgery type.

## Outcome Measures

Twelve questions make up the FJS-12, shown in Table 1. Each is scored on a Likert scale ranging from 0 to 4. The total sum of the scores is converted into a scale ranging from 0 to 100, where higher scores reflect less joint awareness during activities of daily living. The iHOT-12 assesses the functional outcomes of hip arthroscopy. A visual analog scale (VAS) is used to score 12 questions with the mean value of all questions equating to the total iHOT-12 score. The score ranges from 0 to 100 with a higher score reflecting less symptoms and better function. The EuroQol-5 Dimension-5L (EQ-5D-5L) consists of an index score and a visual analog scale. The index score contains five domains which include mobility, self-care, usual activities, pain/discomfort, and anxiety/depression. Scores range from -0.594 to +1 for the United Kingdom EQ-5D-5L value set. The VAS is a self-assessment of a patient's health state and is scored from 0 to 100 on a 100mm scale. Patient satisfaction was assessed using a five-point Likert scale.

An anchor-based approach was used to establish the PASS. The anchor question used was modified from that designed by Tubach *et al.* [33] Patients were asked "How satisfied are you following your surgery?" The response to the question was graded using a 5-point Likert scale: very satisfied, satisfied, neither satisfied or dissatisfied, dissatisfied or very dissatisfied. We dichotomized responses for analysis, accepting 'satisfied' and 'very satisfied' responses as positive. Distributional statistical methodology was used to calculate the MCID.

## Statistical Analysis

Statistical analysis was undertaken using Statistical Package for Social Sciences (SPSS) software (IBM, Inc., Armonk, New York, United States) v24. Normality was assessed using Shapiro-Wilk testing. Continuous, normally distributed data was reported as mean with standard deviation and was compared using 2-tailed student t-tests. Non-parametric data was reported as median with interquartile range and compared using Mann Whitney U-tests. Cross-tabulated data for dichotomous variables were analyzed using chi squared tests. A p-value of $<0.05$ was considered statistically significant.

Receiver operator curve (ROC) analysis was used to identify thresholds for the FJS-12 score that predicted a satisfactory outcome. The area under a ROC curve ranges from 0.5, indicating a test with no accuracy in distinguishing the outcome variable (e.g. satisfaction), to 1.0 where the test would be absolutely accurate at identifying the outcome variable in all patients. The threshold is equivalent to the point (FJS-12 score) at which combined sensitivity and specificity are maximal in predicting the outcome variable. A ROC curve with an area under the curve of $>0.7$ is considered to demonstrate a test with acceptable discriminatory power and $>0.8$ is considered excellent.[34] For the purposes of dichotomous statistical analysis pertaining to satisfaction, patients stating they were 'very satisfied' or 'satisfied' were considered satisfied while all other responses were considered unsatisfied. Pearson correlation analysis was used to correlate postoperative FJS-12 score with preoperative patient variables and other PROMs. A correlation co-efficient for each test $<0.2$ was considered 'very weak', 0.2 to 0.39 was considered 'weak', 0.4 to 0.59 was considered 'moderate', and greater than 0.6 was considered strong.[35]

## Ethics Approval and Consent to Participate

Institutional review board approval was granted in keeping with advice from the local research ethics service (NHS HRA, South East Scotland Research Ethics Committee).

**Table 1.** Questions comprising The Forgotten Joint Score-12

| |
|---|
| 1. Awareness in bed at night? |
| 2. Awareness sitting on a chair for more than 1 hour? |
| 3. Awareness when walking for more than 15 minutes? |
| 4. Awareness when taking a bath or shower? |
| 5. Awareness when traveling in a car? |
| 6. Awareness when climbing stairs? |
| 7. Awareness when walking on uneven ground? |
| 8. Awareness when standing up from a low position? |
| 9. Awareness when standing for long periods of time? |
| 10. Awareness when doing housework or gardening? |
| 11. Awareness when taking a walk or hiking? |
| 12. Awareness when doing your favorite sport? |

## Results

Seventy-seven patients underwent hip arthroscopy at our institution in the period under review, and 65 patients (84%) completed postoperative PROMs scores at a mean follow up of 23.8 months (SD 6.4). No patients were excluded. The specific surgical procedures performed are detailed in Table 2. Demographic information for the patient group is presented in Table 3. Preoperative FJS-12 score range was 0 − 69. Pre- and postoperative scores for the FJS-12, iHOT-12, EQ-5D index, and VAS scores are shown in Table 4. Six patients progressed to require reoperation (two requiring further arthroscopy, four requiring total hip arthroplasty).

### Change Between Preoperative and Postoperative Scores

There was a mean change of 27.2 (SD 30.6) points in FJS-12 score between pre- and postoperative review ($p < 0.001$)(Table 4). Using the method of one half of the standard deviation of the difference in preoperative and postoperative outcome score to quantify the MCID, we found this to be 15.3 points. Thirty-seven patients (56.9%) met or surpassed the MCID, 33 (89.2%) of which also achieved the PASS threshold.

**Table 2.** Summary of Procedures Performed

| | n |
|---|---|
| Acetabular procedures | |
| Labral repairs | |
| With or without rim recession | 49 |
| With microfracture with or without rim recession | 6 |
| Labral resection | |
| With or without rim recession | 15 |
| With microfracture and rim recession | 6 |
| With removal of loose body | 1 |
| Femoral procedure | |
| Cam removal | |
| Isolated cam removal | 64 |
| With osteophyte removal | 9 |
| With microfracture | 3 |
| Femoral procedure not recorded | 1 |

**Table 3.** Patient Demographic Characteristics

| | n = 77 |
|---|---|
| Age | 30.3 years (SD 8.2) |
| Gender | 54 female/23 male |
| BMI | 25.4 kg/m$^2$ (SD 4.2) |
| Tönnis grade | 57.1% 0, 42.9% 1 |
| Preoperative Tegner score | 4 (IQR 3 − 5) |
| Lateral center edge angle | 37.50$^o$ (SD 8.86) |

BMI, body mass index; SD, standard deviation; IQR, interquartile range.

### Satisfaction and FJS-12

Seventy-three patients answered the satisfaction question. Of these, 25 stated they were very satisfied, 20 satisfied, 13 neither satisfied nor dissatisfied, 10 dissatisfied, and 5 very dissatisfied. As such 45 (61.6%) respondents were coded as satisfied for analysis. Satisfied patients had greater mean improvement in the FJS-12 compared to unsatisfied patients ($P < .001$; Table 5). There was no significant difference in age, gender distribution, or preoperative FJS-12 score between those who were satisfied and those who were not satisfied (Table 6).

### PASS for the FJS-12

The calculated PASS threshold for the absolute FJS-12 score at a mean follow-up of 23.8 months (SD 6.4) after surgery was 38.5 points (sensitivity 80%, specificity 88%), and the area under the curve was 0.85 (95% confidence interval 0.75-0.95) (Fig 1). There was a total of 35 (53.8%) patients who achieved the PASS score. Eleven patients had a preoperative FJS-12 score exceeding the PASS threshold. Three of these failed to achieve the PASS score after surgery because of increased postoperative joint awareness, and 1 was lost to follow-up.

### Correlating FJS-12 Score With Postoperative Proms and Preoperative Patient Factors

Univariate correlation analyses of postoperative FJS-12 with preoperative patient characteristics are illustrated in Table 7. The strongest association with postoperative FJS-12 score was seen with preoperative EQ-5D-5L Index ($r = 0.557$, $P < .001$) and preoperative

**Table 4.** Preoperative and Postoperative Patient-Reported Outcome Measures

| | Preoperative | Postoperative | *P* Value |
|---|---|---|---|
| FJS-12 | 19.29 (SD 17.5) | 46.5 (SD 33.1) | <.001 |
| iHOT-12 | 31.56 (SD 16.6) | 59 (SD 28.1) | <.001 |
| EQ-5D-5L | 0.493 (SD 0.250) | 0.624 (SD 0.284) | <.001 |
| VAS | 64.4 (SD 19.7) | 71.2 (SD 21.1) | .034 |

SD, standard deviation; FJS-12, Forgotten Joint Score-12; iHOT-12, International Hip Outcome Tool 12; EQ-5D-5L, EuroQol-5 Dimension-5L; VAS, visual analog scale.

**Table 5.** Change in Preoperative and Postoperative FJS-12 Scores for Those Who Were Satisfied or Unsatisfied

| | Satisfied Patients | Unsatisfied Patients | *P* Value |
|---|---|---|---|
| FJS-12 | 62.3 (SD 29.8) | 21.3 (SD 20.0) | <.001 |
| Change in FJS-12 | 41.4 (SD 26.1) | 4.6 (SD 22.7) | <.001 |

SD, standard deviation; FJS-12, Forgotten Joint Score−12.

iHOT-12 score ($r = 0.451$, $P < .001$). Postoperative FJS-12 score was not significantly different between genders ($P = .701$), according to the presence of pincer or cam morphology ($P = .713$, and $P = .202$, respectively), for patients with previous contralateral hip arthroscopy ($P = .713$) or for those undergoing revision surgery ($P = .111$). Postoperative FJS-12 score showed strong significant correlations with postoperative iHOT-12 score ($r = 0.801$, $P < .001$), EQ-5D-5L index ($r = 0.748$, $P < .001$), and VAS ($r = 0.671$, $P < .001$).

## Discussion

The primary finding from this study was the identification of the PASS threshold for the FJS-12 (38.5 points). This threshold has an associated sensitivity and specificity of 80% and 88%, respectively, and an area under the curve of 0.85 (95% confidence interval 0.75-0.95). Postoperative FJS-12 score showed strong correlations with postoperative iHOT-12, EQ-5D-5L index, and VAS score and also moderate strength correlation with preoperative EQ-5D-5L index, iHOT-12, and FJS-12 scores. The study hypothesis is confirmed, because this PASS threshold is both highly sensitive and specific for establishing whether patients have achieved an acceptable symptomatic state after surgery.

A number of PROMs related to hip arthroscopy have had PASS scores calculated, including the HOS-ADL,[36] HOS-SS,[36] iHOT-12,[23,36-38] mHHS,[39] and Nonarthritic Hip Score.[40] The wording of our anchor question was very similar to others used in the PASS literature, which allows for comparisons at face value. The 38.5 points reported here as a PASS for the FJS-12 is surprisingly low on the 0-100 score scale to qualify as an acceptable outcome; however, this should be interpreted in light of normative data for young healthy people, which suggests 65.9 as the mean FJS-12 score.[41] As with all PASS calculations, this threshold is devised from the overall cohort's responses, and there will be individual patient-dependent variation within this, as reflected by the 11 patients here with a preoperative FJS-12 score greater than the PASS threshold.

Just over half of our patient cohort (53.8%) achieved the PASS threshold for the FJS-12. This number is lower than the proportions of hip arthroscopy patients documented achieving PASS using different metrics, such as the iHOT-12,[23,38] the Nonarthritic Hip Score,[40] and the mHHS[39] in similar patient cohorts. This could be explained by the joint awareness construct being distinct from measuring joint function.[42] It is thought that joint awareness is a more sensitive measure of joint pathology, and therefore it is more challenging to score highly after surgery. This likely explains why patients in our cohort achieved the PASS threshold less frequently than previous studies. However, it is also for this reason that this outcome tool is effective in distinguishing good from excellent performers after hip arthroscopy and why it has been recommended for young, active patients.[8] Other outcome tools used to assess hip arthroscopy have demonstrated significant ceiling effects with an inability to distinguish good from excellent outcomes.[33] Our results here present a PASS score in the lower half of possible scores on the 0-100 scale of the FJS-12, suggesting that while not a sports-specific score, the FJS-12 may be useful in assessing high-performing patients. We appreciate that the FJS-12 should be used with skepticism because it was primarily validated for arthroplasty, and early validation studies for arthroscopy have including modest numbers[8,10]; however its patient-centered approach is likely to appeal to researchers and clinicians in arthroscopy as it has done in arthroplasty.

Patients with better baseline function are more likely to achieve acceptable postoperative symptom states and this has been previously reported in the evaluation of the Harris Hip Score,[22] Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC), EuroQol-5D (EQ-5D), and Oxford scores.[18,19] Similarly, whilst not a predictive analysis, the correlations presented here suggest that higher levels of preoperative function and symptomatology (as assessed by FJS-12, iHOT-12, EQ-5D-5L index, and VAS) are associated with improved postoperative joint awareness following hip arthroscopy. There was a strong satisfaction link with the success of surgery as measured by the FJS-12. Those who were satisfied following surgery had a mean FJS-12 score 41 points higher than those who were dissatisfied and had a mean increase in their score of 36.8 points more than dissatisfied patients. That those dissatisfied with surgery had minimal change in symptoms postoperatively is likely lowering the

**Table 6.** Demographics and Preoperative FJS-12 Scores for Patients Who Were Satisfied or Unsatisfied

| | Satisfied Patients | Unsatisfied Patients | *P* Value |
|---|---|---|---|
| Age (years) | 31.3 (SD 8.5) | 29.0 (SD 7.8) | .248 |
| Gender distribution | 34 female: 11 male | 19 female: 9 male | .473 |
| Preoperative FJS-12 Score | 14.6 (IQR 8.3 − 28.1) | 10.4 (IQR 2.6 − 32.3) | .189 |

SD, standard deviation; FJS-12, Forgotten Joint Score−12; IQR, interquartile range.

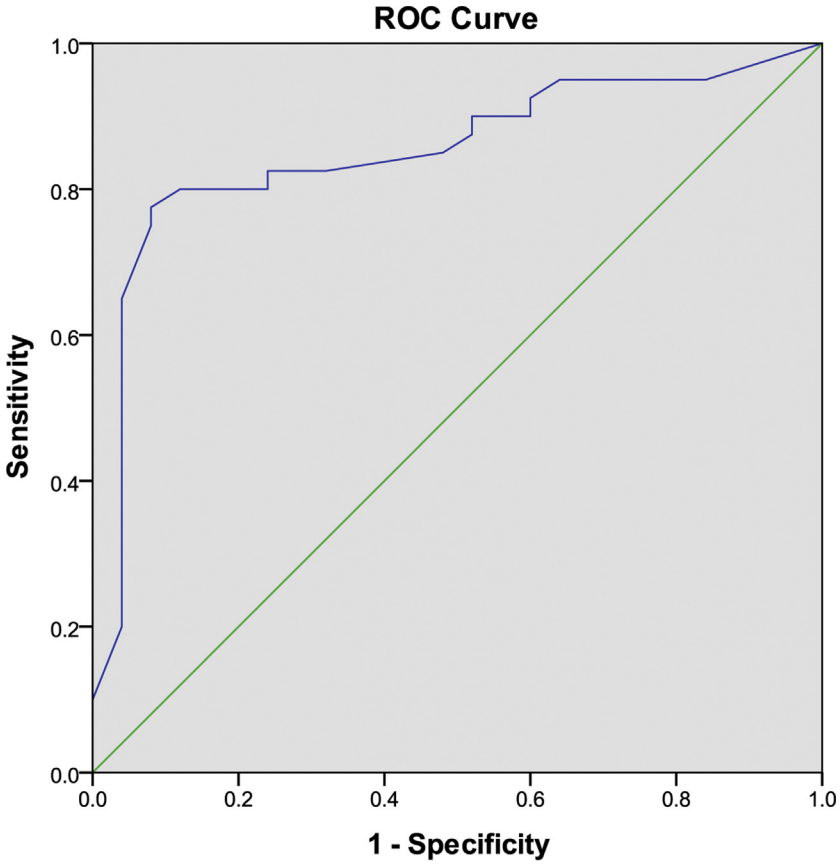


**Fig 1.** Receiver operator characteristic (ROC) curve for the threshold score of the FJS-12 to determine the patient acceptable symptomatic state.

threshold for PASS. Although only 38.5 points are required to achieve PASS, the satisfied patients in our cohort reported a mean FJS-12 of 62.3 points (essentially the same as age-matched healthy populations). In addition, postoperative quality of life scores and functional scores were strongly correlated with the FJS-12, suggesting that this outcome metric has properties that capture a total holistic view of the patient's outcome.

**Table 7.** Univariate Correlation Analysis Between Preoperative Factors and Postoperative FJS-12 Score

| | r | *P* Value |
|---|---|---|
| Age | −0.061 | .631 |
| BMI | −0.322 | .009* |
| SIMD vigintile | 0.202 | .109 |
| Symptom duration | −0.205 | .110 |
| Pre-injury Tegner score | 0.169 | .190 |
| Lateral center-edge angle | 0.104 | .411 |
| Tönnis classification | −0.128 | .310 |
| Preoperative Tegner score | 0.347 | .006* |
| Preoperative FJS-12 score | 0.404 | .001* |
| Preoperative iHOT-12 score | 0.451 | <.001* |
| Preoperative EQ-5D-5L index | 0.557 | <.001* |
| Preoperative VAS | 0.278 | .025* |

r, Pearson correlation coefficient; BMI, Body mass index; SIMD, Scottish Index of Multiple Deprivation; FJS-12, Forgotten joint score-12; iHOT-12, International hip outcome tool 12; EQ-5D-5L, EuroQol-5 Dimension-5L; VAS, visual analog scale.
*Significant correlation ($P < .05$).

## Limitations

This study is not without its limitations. It carries the limitations typical of a retrospective case series, including possible inconsistent reporting of data, loss to follow-up (although this was limited to 16%), and the absence of a control group. This study featured a relatively modest sample size and large spread of data and would benefit from a significantly larger dataset. The minimum of 1 year of follow-up is a further limitation. The continuing lack of an agreed gold-standard format for anchor questions in the literature to determine patient satisfaction to allow PASS threshold calculation is a limitation of all studies reporting this psychometric statistic.[33] Additionally, this study's generalizability may be limited by this being a single-surgeon series, as well as by the mix of labral procedures (both debridement and repair) and a United Kingdom–based population.

## Conclusions

We report a postoperative PASS threshold of 38.5 points for the FJS-12 after hip arthroscopy for FAI in a United Kingdom population. This value can act as a quantifiable target for clinicians using the FJS-12 to

monitor patient outcomes in practice. FJS-12 has strong correlations with EQ-5D-5L, iHOT-12 and VAS at minimum 12 months postoperatively.

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