Does patient satisfaction after foot surgery change with time? A mid-term retrospective study using PASCOM-10

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Research

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Abstract

Background: Recording patient reported outcome measurements at six months after surgery using PASCOM-10 is common practice in podiatric surgery. The aim of this study is to establish if patient satisfaction after foot surgery is changed at the 12 month point.

Method: An audit of patient reported outcomes following foot surgery was undertaken. Electronic case notes were examined, and 236 patients were identified over a 1-year period. Patients completed the Manchester Oxford Foot Questionnaire (MOXFQ) pre-surgery, at six-months post-operatively (in person/telephone conversation) and were then invited by letter to re-complete this again at 12-months post-operatively. 91 participants (39%) completed both post-operative questionnaires (66 females 25 males). The average age was 64 (range: 35-93).

Results: The results demonstrate that there was a significant effect between the three time points in the MOXFQ domains of walking/standing, pain and social interaction (0.353, F (6, 356) = 40.59, p <.001), and a further interaction with gender (0.435, F (6,352) = 30.23, p <.001). An average, positive change in patient satisfaction in all domains is the greatest from pre-surgery to 6-months post-surgery at 78% and then decreases to 62% 12-months post-surgery. Negative and insignificant changes are highest from 6 to 12 months. Females experience lower satisfaction at the six- and 12-month post-operative time points but gain the greatest improvement in patient satisfaction at 30%. National PASCOM data significant with all domain comparisons data (p< .001) is a subset.

Conclusion: A patient centred approach is key in foot surgery when determining patient satisfaction. Patient satisfaction levels change significantly at different time points. In this review, the overall patient satisfaction improved with surgery, but with a higher response score at six months than 12. A short period of recovery may not yield the genuine long-term patient reported outcomes and increase to 12 months is recommended from the more common six months. However, the differencing methods of collecting post-operative data may have had an influence on scores.

Introduction

The NHS takes a patient centred approach to health care with an estimated 1.5 million people being supported daily by health services in the UK (1). There is therefore a need to understand patients' experience of access to healthcare services: this together with clinical effectiveness and safety is seen as a central outcome (2, 3). As people become more involved in their own health care and hope to receive a service of the highest quality and safety, there is a drive to identify the best way to measure people's expectations, experiences, and satisfaction within healthcare (4). The evaluation of patient experience alongside Care Quality Commission (CQC) reporting is useful for service improvement with the comparison of different health care programs and systems. Evaluating the quality of care and patient satisfaction can be undertaken by identifying the needs of a service, linking clinical outcomes and costs (5). There are numerous health outcome tools available and used. Patient reported outcomes measures (PROMs) that are appropriately designed condition-specific can deliver reliable and valid measures that are of most concern to patients, such as pain, function, mobility, and health-related quality of life (3, 6). However, it is important for the tools to be responsive to change, reproducible and reflective of the patient's perception (7) and some authors suggest a shift toward the consistent use of a smaller number of valid, reliable, and clinically useful scales (8).

An initial scoping literature search by the lead author highlighted 44 articles concerned with the outcomes of foot surgery within a two-year period. Of 23 unique tools, the top three were the American Orthopaedic Foot & Ankle Society (AOFAS) (9), the Visual Analogue Scale (VAS) (10) and the Manchester-Oxford Foot Questionnaire (MOXFQ) (11), which together account for 66% usage of all the tools used. In 2018, a systematic review of five years' data by Shazadeh Safavi *et al* (12) reported on 76 tools; in 2019 the review by Lakey & Hunt (13) reported on 89 tools. AOFAS has not been proved to be valid or reliable, and in 2011 AOFAS released a statement recommending discontinued use of the system (14). The VAS is generic, non-specific to disease or foot region, with low specificity for minimally clinically important differences (MCID) (13) but the MOXFQ has been confirmed for validity, reliability, and responsiveness (15). Its use has increased with popularity from 1% use in the review by Hasenstein *et al* (8) in 2017, to 39% in the senior author's search.

Foot and ankle pathology account for a significant percentage of all orthopaedic interventions. Podiatric surgery is concerned with the surgical management of foot and ankle conditions and has grown in scope of practice since the encouragement of day case surgery in the 1990's (16), with day surgery saving the NHS around £2 billion from 1998 to 2013 (17). MOXFQ is the adopted standard instrument for the Royal College of Podiatry (18) via the podiatric and surgical clinical outcome measurement system (PASCOM) which is mandatory for all Podiatric Surgery teaching units in the UK (7). MOXFQ is completed pre-surgery and 6-months post-operative as standard (19) but there are no universally accepted guidelines or best practice available on recommended time intervals, with limited studies evaluating time points as a primary indicator for outcomes.

Patients' expectations and experiences are liable to change with time although data from studies have been found to be conflicting. The retrospective study by Taylor *et al* (19) using patient satisfaction questionnaire (PSQ-10) with a follow up time ranging from seven to 82 months found no significant statistical time points, however they advised six-months would remain as standard. A study by Stone et al. (20) not reporting time points, explored the long-term outcomes conclude that arthrodesis outperformed arthroplasty in the long term, using VAS and Visual Analogue Scale Foot and Ankle (VAS FA). A 5-year prospective cohort study (21) for osteochondral lesion of the talus at 1- and 5-year outcomes on pain and function found that some pain remains but marked improvement at both time points (the Foot Function Index [FFI] was used).

The aim of this study is to determine if patient satisfaction is influenced after foot surgery with differing time intervals in a cohort of podiatric surgery patients using tools from PASCOM-10. The hypothesis that this study sets out to establish is that there will be no differences in patient satisfaction after foot surgery with differing time intervals.

Method

Search strategy

For the literature review, a strategy was adopted that involved searching for research evidence on foot surgery, patient outcomes with time intervals via three different sources:

- Electronic databases - the University of Huddersfield Library electronic database,
- Reference lists,
- Google Scholar.

The authors had access to the following databases which were considered the give the best chance of identifying appropriate sources:

- CINHAL (Cumulative Index to Nursing/Allied Health Literature: 1981 - present)
- PUBMED,
- Scopus,
- Summon.

Additionally, UK podiatric journals were hand-searched. Inclusion criteria for selected articles were those that considered or discussed:

- Foot surgery,
- Patient outcomes,
- Time intervals.

Exclusion criteria were studies transcribed and translated from languages other than English and multiple surgeries.

A second scoping literature search was performed with a two-year period. The same criteria used as the literature search with one exception: the inclusion of all patient outcomes, not only ones with reported intervals. This resulted in 44 articles being included with 83 outcome tools. The details of the articles can be seen in Appendix 1 and a summary of the outcome tool can be found in Table 1.

Table 1
Outcome tools by number used in scoping study search results

No.	Abbreviation	Name
19	AOFAS	The American Orthopaedic Foot & Ankle Society
19	VAS	Visual Analog Scale
17	MOXFQ	The Manchester Oxford Foot Questionnaire
5	FAAM	Foot and Ankle Ability Measure
3	EQ-5D	EuroQol-5D
2	Maryland	Maryland Foot Score
2	FADI	The Foot and Ankle Disability Index
2	SF-12	12-Item Short Form Health Survey
2	Unknown	Unknown questionnaire
1	Ankle-Hindfoot	Ankle-Hindfoot Scale
1	Dutch PROMS	Dutch Patient-Reported Outcome Measurement
1	EQ-5D L	EQ-5D-3 L
1	EQ-VAS	EuroQol visual analogue health thermometer
1	FAOI	Foot and Ankle Outcomes Instrument
1	PROMIS PF and PI	Foot and ankle registry
1	FFI	Foot Function Index
1	Likert	Likert satisfaction scale
1	OMAS	Olerud-Molander Ankle Score
1	SAFE-Q	Self-Administered Foot-Evaluation Questionnaire
1	FFI-R	The Foot Function Index-Revised
1	SANE	Single Assessment Numeric Evaluation questionnaire
1	SF-36	36-Item Short Form Health Survey

PASCOM data

The study is a retrospective, quantitative audit to assess patient satisfaction at six and 12 months in one NHS podiatric surgery centre in the UK. 269 participants were identified (convenience sample) from a retrospective screen of the PASCOM surgical database from January to December 2019. The authors considered that the 12 month time period would generate an acceptable cohort of participants. The participants were then checked that MOXFQ values were recorded at pre-surgery assessment. Following this, 33 blank forms, duplicates, and data errors were excluded. A grand total of 236 patients were included in the cohort, see flow chart in Fig. 1.

236 questionnaires were prepared for the 12-month point for all participants; these questionnaires were sent though the post with free postage returns at the appropriate 12-month post-surgery interval. 163 were returned, with

marked deceased, one late return and 73 lost to follow up. The 6-month data was collected during the post-operative appointment. These appointments were not available after April 2021 due to coronavirus restrictions, and thus were sent out through the post. This affected 76 participants. 120 questionnaires were completed, 115 lost to follow up. 91 participants (39%) completed both 6-month and 12-month questionnaires (N = 91). The study data is a representative subset of the National PASCOM database, a secondary-data source gained direct from the website for all UK locations for 2019. This data can be used to draw conclusions of how true a likeness this study data is to the national data.

The MOXFQ questionnaire (Appendix 2) is designed for hallux valgus surgery but is used by Podiatric Surgeons for all foot surgery. There are 16 questions using a Likert scale, Table 2 shows the questions asked and the value associated to one of three domains of patient satisfaction: walking/standing (WS), pain (P) and social interaction (SI). Table 3 shows the question split to domain and the MCID for each domain. The values from the Likert scale are converted in percentages and used as interval data.

Table 2
MOXFQ Likert Scale answers and values

Question Number (s)	Likert scale answer	Value
1–14	None of the time	0
	Rarely	1
	Some of the time	2
	Most of the time	3
	All of the time	4
15	None	0
	Very mild	1
	Mild	2
	Moderate	3
	Severe	4
16	No nights	0
	Only 1 or 2 nights	1
	Some nights	2
	Most nights	3
	Every night	4

Table 3
MOXFQ Questions Numbers and categories (12)

Question Numbers	Category	MCID
2, 3, 4, 5, 6, 7, 8	walking/standing	16
1, 11, 12, 15, 16	pain	12
9, 10, 13, 14	social interaction	24

Data analysis

Analysis conducted in Microsoft Excel and Access, and all descriptive statistics in SPSS version 26.0 (IBM Corp) following the parsimonious model. Significance level .05, confidence interval 95%.

Analysis of variance (ANOVA) was used with the Bonferroni adjustment. The Huynh-Feldt correction was used where the Mauchly test of sphericity was violated and where an interaction effect was found, an analysis of simple effects was performed. Tests of within subjects' effects uses Wilks Lambda test.

Repeated measures mixed analyses of variance were performed on all 91 participants with data from all time points to analyse if there were any significant changes in time or differences in outcome between the treatment groups for domains of WS, P and SI, age, gender, or treatment type, location and sequalae over time.

The variables deemed to be of interest for this research included WS, P and SI (all domains) gender and all time points. The national PASCOM database has the variables domain (WS, P and SI) and time points (pre-surgery and 6-months) therefore a pairwise comparison can be done. The Cohen's test for effect size will be utilised.

Findings

Study Data

91 participants included from 269 identified, after exclusion, errors, and missing data. 66 Female and 25 Male. Mean age is 64 (65 f, 61 m) range 35–93 years.

Variables

Time points collected for MOXFQ include pre-surgery, 6-months, and 12-months post-operative. Surgery location on the foot was too small to be analysed individually and was grouped (forefoot hallux, forefoot and midfoot/rearfoot). Surgery type and complications has insufficient numbers to enable analysis (16). There are 76 variations and 70 unique types, and 7 incidents of complications (sequela) recorded, Table 4.

Table 4
Individual recorded sequela

Sequela	Further Information	Sequela (secondary)
SWB Healing: ischaemia/necrosis	6 weeks post op	NA
PO bleed reported by patient	3 days post op	NA
INFS Infection: suspected/not proven	1–4 weeks post op	BKD Healing: wound breakdown
DHC Healing: wound dehiscence	3–4 weeks post op	NA
DHC Healing: wound dehiscence	2–3 weeks post op	NA
DVT Morbidity: deep vein thrombosis	4 weeks post op	NA
Excessive post treatment pain (first 72 hours)	2 days post op	NA

Data analysis – ANOVA

Mauchly's test indicated that the assumption of sphericity had been violated in all findings, and the degrees of freedom were corrected using Huynh-Feldt estimates of sphericity, results are given via variable for all domains of WS, P and SI.

Age of participant

An interaction between age and time points could not be demonstrated, $F(1.69,149.99) = .092$, $p = .882$, $F(1.74,154.5) = .827$, $p = .424$, $F(1.58,136.77) = .351$, $p = .653$ WS, P and SI respectively.

Location of surgery

The results show that there were no significant effect of location of surgery with any time point, $F(3.42,150.42) = 1.79$, $p = .144$, $F(3.50,153.79) = .99$, $p = .41$, $F(3.17,139.57) = .61$, $p = .622$ WS, P and SI respectively. Age and location of surgery shall not be included further, no effect has been found.

Time points

We can report that there was a significant interaction between the time points for all domains, Wilks' Lambda = 0.353, $F(6, 356) = 40.59$, $p < .001$, and for all time points in combination, shown in Appendix 3, Fig. 2, Fig. 3 and Table 5. This effect tells us that if we ignore all other variables, values were different for pre-surgery, 6-months, and 12-months.

Table 5
Breakdown of the analysis of MOXFQ scores across the domains

n = 91	*Multivariate*	Univariate		
		Walking/Standing	**Pain**	**Social Interaction**
Time Points	*F(6, 356) = 40.59*, P < .001	*F(1.67, 149.90) = 115.15*, P < .001	*F(1.72, 155.2) = 157.5*, P < .001	F(1.59, 140.22) = 117.93, **P < .001**
Gender	*F (6,352) = 30.23*, P < .001	*F(1.72,153.27) = 4.773*, P = .013	*F(1.78,158.54) = 5.01*, P = .010	F(1.6, 142) = 2.898, *P* = .070
Age	*F (6,352) = .574, P = .75*	*F(1.69,149.99) = .092, P = .882*	*F(1.74,154.51) = .827, P = .424*	F(1.58,140.26) = .351, *P* = .653
Location	*F (12,460.65) = .1.11, P = .353*	*F*(3.42,150.42) = 1.79, *P* = .144	*F*(3.50,153.79) = .99, *P* = .41	*F*(3.17,139.57) = .61, *P* = .622
Multivariate results reported using Wilks Lambda. **Bold is significant to P < .05.**				

Table 6
p-value of the analysis of MOXFQ scores across the domains.

	Between subject effects		
	Walking/Standing	**Pain**	**Social Interaction**
Pre-surgery to 6/12	P < .001	P < .001	P < .001
6/12–12/12	P = .002	P < .001	P < .001
Pre-surgery to 12/12	P < .001	P < .001	P < .001
Gender	*P = .833*	*P = .651*	*P = .854*

Table 7
MCID % Change in domains at time points

Time Points	Walking/Standing Domain			Pain Domain			Social Interaction Domain		
	Positive	Negative	Insig-nificant	Positive	Negative	Insig-nificant	Positive	Negative	Insig-nificant
Pre to 6 months	80%	1%	19%	86%	0%	14%	68%	0%	32%
Pre to 12 Months	73%	4%	23%	78%	2%	20%	58%	3%	38%
6 to 12 months	10%	21%	69%	5%	33%	62%	2%	14%	84%

Gender

We can report that there was a significant interaction between gender and time points for domains WS and P, $F(1.72,153.27) = 4.773$, $p = .013$, $F(1.78,158.54) = 5.01$, $p = .010$ (Table 6), however there was not significant effect with SI and time points, WS, P and SI ($P = 0.833, .651, .854$ respectively). The interaction of time and gender is non-significant, Wilks' Lambda = 0.935, $F (6,352) = 2.02$, $p = 0.62$, although there was significant effect of gender with linear effect at all time points, Wilks' Lambda = 0.435, $F (6,352) = 30.23$, $p < .001$. Time shown in Figs. 4 and 5. See Appendix 3.

Adjustment for multiple comparisons: Bonferroni. Based on estimated marginal means - the mean difference is significant at the .05 level.

Female levels of dissatisfaction are higher than men across all the domains at pre-surgery and at 12-months. Satisfaction from pre-surgery to 6 months females have the greatest gain ($p = .013$), 82%,82% and 81% compared to males 69%, 64% and 736%, for WS, P and SI. 6 to 12-months both genders have a decrease in satisfaction ($p = 0.10$). Males have a 92% decrease in SI compared to females at 75% however there is of no significance found for SI and gender, $p = 0.854$. Females' satisfaction levels increase an average 67% (69%,66%,66% - WS, P and SI) for all pre-surgery to 12-months, compared to men at 47% (47%,47% and 48 – WS, P and SI) however there is no significant effect found ($p = 0.70$).

Data analysis – national data

The national anonymised data from MOXFQ was provided by the PASCOM team for the year 2019: n = 5449. The national data details MOXFQ for pre surgery, 6-months and treatment performed. There is no demographic data available in this dataset. Time point is required for pre-surgery and 6-months, therefore 124 and 3883 (4007) have been excluded, leaving 1442 included for this pairwise analysis. Figure 6.

On examination, descriptive data shows a similarity in appearance between the national data and the study data regarding distribution curves, skewness, and kurtosis. The mean and standard deviation are calculated and although similar in appearance Cohen's d statistic is used to measure the effect size of magnitude. The negligible results show a small effect size difference in the two means thus showing they are representative of each other (see Table 8).

Table 8
Cohen's d formula and test results for domains and time Points

Domains	Time Point	Cohen's *d*
Walking/Standing	Pre-Surgery	0.052439
	6-months	0.158167
Pain	Pre-Surgery	0.033698
	6-months	0.234483
Social Interaction	Pre-Surgery	0.005992
	6-months	0.096842

Time Points

On average, all domains show effect at differing time points (Table 9). This difference was significant with all comparisons with $p < .001$.

Table 9
Pairwise Comparisons using SPSS

	Time 1	Time 2	Mean Difference (Time 1–2)	Std. Error	Sig.	95% Confidence Interval for Difference	
						Lower Bound	Upper Bound
WS	pre-surgery	6-months	38.485	.767	**.000**	36.981	39.989
P	pre-surgery	6-months	39.248	.716	**.000**	37.842	40.653
SI	pre-surgery	6-months	36.072	.760	**.000**	34.582	37.562

All three domains showed an increase in satisfaction, 72%, 69% 75% change for WS, P and SI where $p < .001$. The MCID calculated for the date (shown in Figure C) displays a similar presentation. Positive change for all domains with a very small negative change (all under 3%). WS and P positive change 79%, 82% whereas SI is only 67%, with a insignificant MCID change of 31% (compare to 18 and 16% of WS and P).

Surgery type

The treatment type performed is available. There are 313 null values and 882 different listed types of treatment (with a frequency 1–12), 751 being used only once. The type of treatment is a free text field, which means that the variation of entry is large. This variable will not be used for analysis as the variance is too large and the frequency is too small, creating measurement bias.

Discussion

The overall values and individual domains relating to patient satisfaction show variations at different time points, all with statistical significance, and all follow the same trajectory. At 6 months post podiatric surgery, patient

experience has the highest satisfaction, an average of 78% across all domains. This is in line with the National PASCOM average for the 6 months' time point of 74%. Patient satisfaction drops during the time period of six to 12 months after surgery, and at 12 months the level of satisfaction is an average 62%.

The need for patient experience at different time intervals, has been suggested by The Health Foundation (4) who recommend a need for further research in assessing the quality of health services over time. 12 months is recommended by Dawson, Coffey et al in the study looking at MOXFQ responsiveness and the use of MCID, compared to AOFAS and SF-36, who found their results superior (15). They report a change in domain values pre surgery to 12 months of 28.5, 32.8 and 34.8 for WS, P, and SI, like our findings of 35.22, 34.5 and 29.64 respectively. The use of MOXFQ in both studies enable the use of a validated and responsive tools with a MCID enables further evaluation of patients perceived satisfaction change. In contrast the study by Taylor *et al* (19) using the PSQ-10 and are unable to report changes over time in their study, they find only a 48% increase in satisfaction and conclude that 6 months is an adequate representation of the outcomes. Due to retrospective nature of data collection their study is unable to specify exact follow up time points, and the sensitivity of the data is unknown.

MOXFQ uses three domains to determine patient satisfaction, all three domains at all three time points have been found to have significant findings.

Walking and standing

A positive change in patient satisfaction levels is high at 80% and 73%, with low negative change at 1% and 4%, pre to 6 months and pre to 12 months respectively. Satisfaction from 6 to 12 months shows a huge drop to 10% in positive change, an increase to 21% in negative and insignificant change of 69%. From surgery to six months patients would have been given guidelines to follow including activity modification, footwear advice, wound care, and pain management. Activity modification may range from weight bearing, walking, returning to work and sports. At the six months post-operative appointment if discharged patients are informed to start returning to normal activity. As patients return to their pre surgery activities does this lead to dissatisfaction, it could be expectations, or inappropriate activity for the time or procedure. High impact and contact sports report most negative outcomes (22).

A number of studies recommend a follow up longer than six months, as certain procedures may require longer periods to fully rehabilitate, such as ankle fusions and getting back in sport (6). Maher and Kilmartin (19) warn that assessing patients early may not provide a realistic gauge of the ultimate outcome, and that for reconstructive foot surgery patients will continue to improve after 12 months. Taylor *et al* (19) discuss forefoot surgery requiring six months, midfoot and hindfoot six-18 months discharge. This study was unable to conclude on surgery type for the results and would benefit from further study in this area.

Pain

The pain domain reports the highest level of positive change (86%, 78%) and lowest level of negative change (0%, 2%) across the time periods pre to 6 months and pre to 12 months, with only one incident of pain sequela reported 2 days post-surgery. Pain levels at both points are similar to those reported at the National PASCOM 6-month point (82% positive and 2% negative change). A value of pain is often used as an indicator of satisfaction, the 5-year study using FFD-I reported higher longer-term pain than mid-term, questioning which factors may affect long term results. The mean pain at 5 years was 15% (22). Similar findings to the study by MacInnes and Roberts who find

75.6% of patients were pain free or with only mild pain (22). There was a large increase in negative pain change during the six to 12 months period at 33%, with only a 5% positive change and 62% reports significant change. Justification for these values may refer to the increase activity discussed earlier, and the level of expectation patients have on long term healing. For example, swelling of feet which can persist for up to two years post-procedure, and musculoskeletal changes in function can be permanent.

Social Interaction

In both the National data and this study values for social interaction are the lowest of all the domains. Positive change is 67%, 68% with negative as 3% and none respectively. The value with insignificant change is the highest of domains at 32%, 38% and 84% for pre to 6 months, pre to 12 months and time period 6 to 12 months. Surgery was performed in 2019 for this study, which means the 6-month and 12-month data may be affected by social limitations in place due to the coronavirus pandemic from March 2020. The corresponding values of the national and study data do appear similar, which lends to little influence.

Footwear must be considered for social interaction, unrealistic expectations such as wearing fashionable or normal shoes for foot surgery may negatively influence the SI of MOXFQ, especially with females. The study by Taylor et al (19) noted the decreased change in footwear by 30% and discussed that patients may have a shoe in mind; however, they are likely to change size and shape, this causes high levels of dissatisfaction.

Gender

The results of the present study demonstrate that at different time points patient satisfaction levels significantly change after foot surgery, with differences in gender. Females have a greater level of dissatisfaction at the time of surgery than males, and then experience a greater improvement, by 12-months they are still less time points for pre-surgery and 12-months but with an overall increase in satisfaction 67%, men 47%. The study by MacInnes and Roberts (22) note a non-significant mean difference of only 17%, unlike 30% in this study. Females' satisfaction levels increase an average 67% (69%,66%,66% - WS, P and SI) for all pre-surgery to 12-months, compared to men at 47% (47%,47% and 48 – WS, P and SI) however there is no significant effect found ($p = 0.70$). Other studies have discussed location, and age as variables that may affect data, this was not found in this study. Digital surgery was associated with more unpredictable outcomes with additional interventions affecting outcome (19). Analysis was not possible for treatment type and complications as previously discussed. However, one study found elderly patients more likely to negatively influence satisfaction (22)

Strengths and limitations of this study

Strengths

The corresponding author is a specialist podiatrist with an honorary contract in the NHFT surgical podiatric team, with a background in database development and analysis. The level of satisfaction has been calculated using the MCID for the MOXFQ outcome tool. This tool has been validated, is reliable, responsive and is increasing in clinical popularity and use. Our study with it secondary search found that 39% of recent studies used MOXFQ as an outcome tool, compared to 1% noted in the study by Hasenstein *et al* (8).

Limitations

The participants were recruited retrospectively from surgical list of studies in 2019 that this centre that had data entered on the PASCOM database. It was a convenience sample. A multi-centre, cohort group study would provide

more representation of the population.

All data collection was performed by the corresponding author using all entries entered onto the PASCOM system by the team. Although all entries who duplicate checked, there is risk of human bias, error in recording of data, and measurement error.

The experimenter effect can result in subtle differences in participant treatment. At the six-months point, the surgeon would discuss the outcomes and his thoughts before requesting the completion of the questionnaire, thus possible influencing the participants scoring. The 12-month point questionnaires were completed through the post, the six-month scores have greater satisfaction due to the experimenter and the 12-month without influence. It is possible that the surgical site itself may have been 'successful' but that if the patient had other pathology in the foot this may bring the overall score down. It is common for patients to seek this clarification in person when completing PASCOM at six-months; this was not possible via a postal questionnaire completed remotely.

The six-month questionnaires have a lower completion number than the 12-month data and after March 2020 when the unit closed due to the COVID-19 pandemic. The average 6-month completion of questionnaires for 2019 was 55%, includes 63% before closing dropping to 38% after closure. The authors are unsure how the missing data may have affected the results or may have altered the responses especially the social interaction domain.

There may be a responder bias from the use of postal questionnaires, with the additional disadvantage of a low response rate and patients not included owing to missing follow up data, a change of address or lack of interest. The authors believe this is in part due to the study being performed at the height of the COVID-19 pandemic.

Conclusion

The results of this study demonstrate that at different time points, patients' experience different levels of satisfaction after foot surgery, with the greatest satisfaction from pre-surgery to six months, with a reduction in that satisfaction by the time 12 months have elapsed. The largest improvement is seen in females compared to males with a 30% difference, however females start and finish more dissatisfied than men.

The current six month point for PROMs to be recorded by the surgical team may not provide the most accurate result for the patient or clinician. Post-operative recovery is not simply a period when all wounds heal and all pain dissipates; it is a period that may last longer, and facilitates patient satisfaction with a return to activity, social interaction, and reduction of pain. Patients need to be aware that six months may not provide the optimum recovery, and once the 6-month stage has been reached it may take time to settle. Whilst acknowledging that different methods of data collection may have had an effect on scores, this study recommends that the six month data collection point for the MOxFQ/PSQ questionnaires be extended to twelve months.

Declarations

Ethics approval and consent to participate: Ethical approval for this study was granted on 14.02.20 from the NHFT Research and Innovation Department, with compliance to NHFT 'Policy for Conducting Clinical Audit Projects' (CLP019). Further information/documentation is available on request.

Consent for publication: Consent for publication was granted via NHFT Research and Innovation Department.

Availability of data and material: via PASCOM-10. The corresponding author will respond to reasonable requests for more information.

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Authors' contributions: IR conceived the aim and format of the study. VN performed the literature search and produced the first draft as part of an MSc in Podiatric Surgery at the University of Huddersfield, supervised by AB. All authors made substantial contributions to the final version.

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Figures

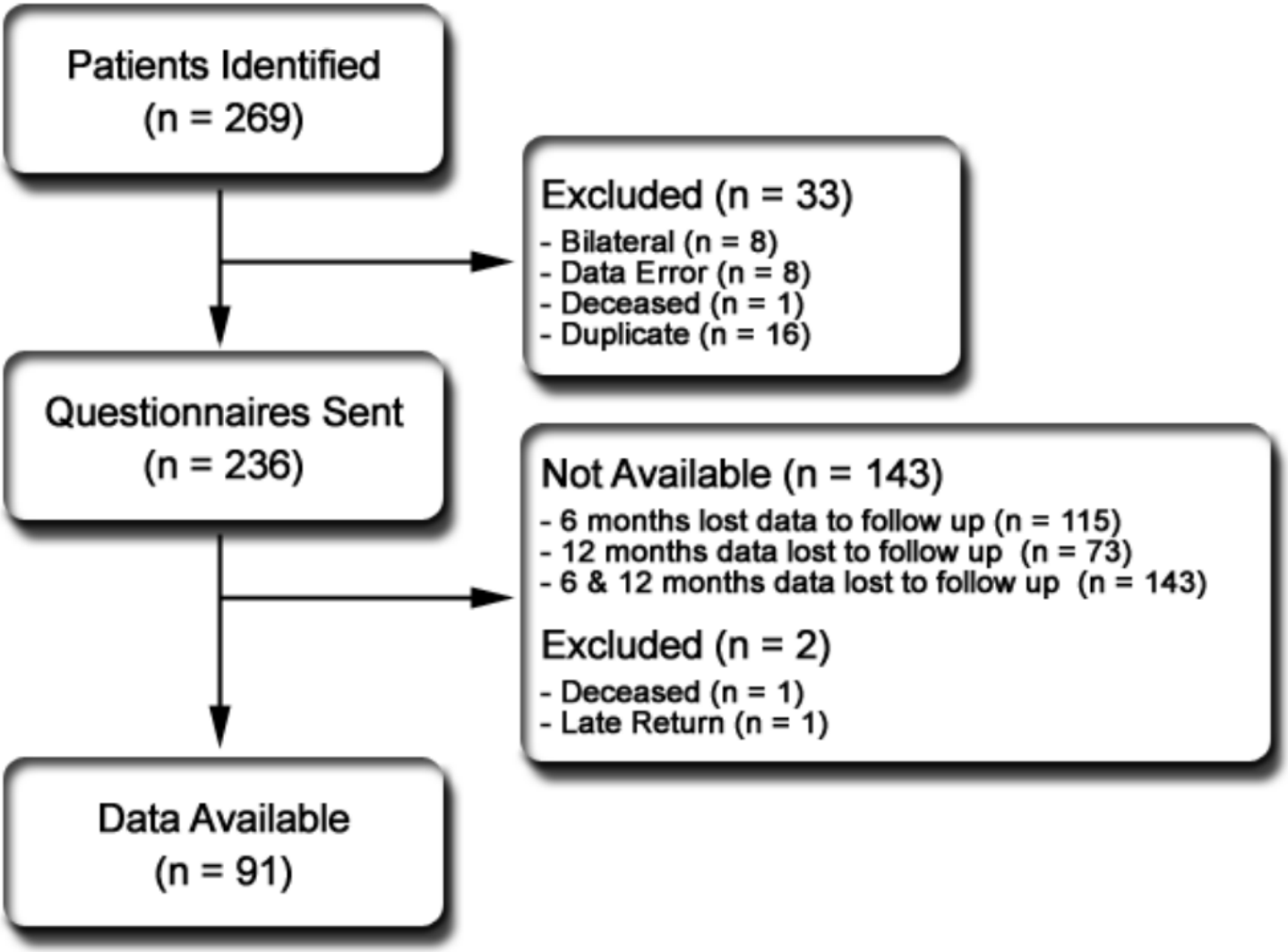
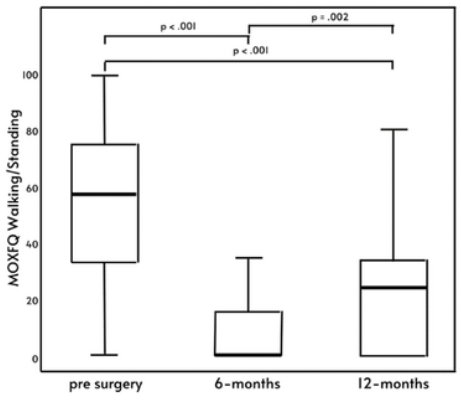
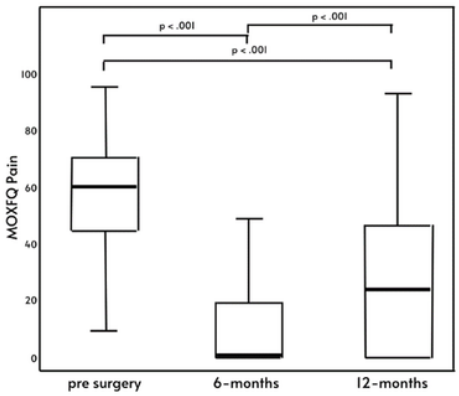


Figure 1

Participant flowchart





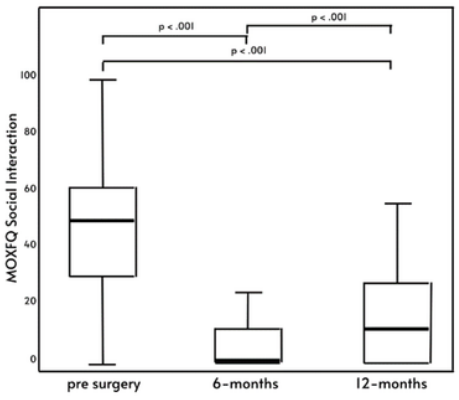


Figure 2

(a,b,c): Domains p-values at time points Created using SPSS

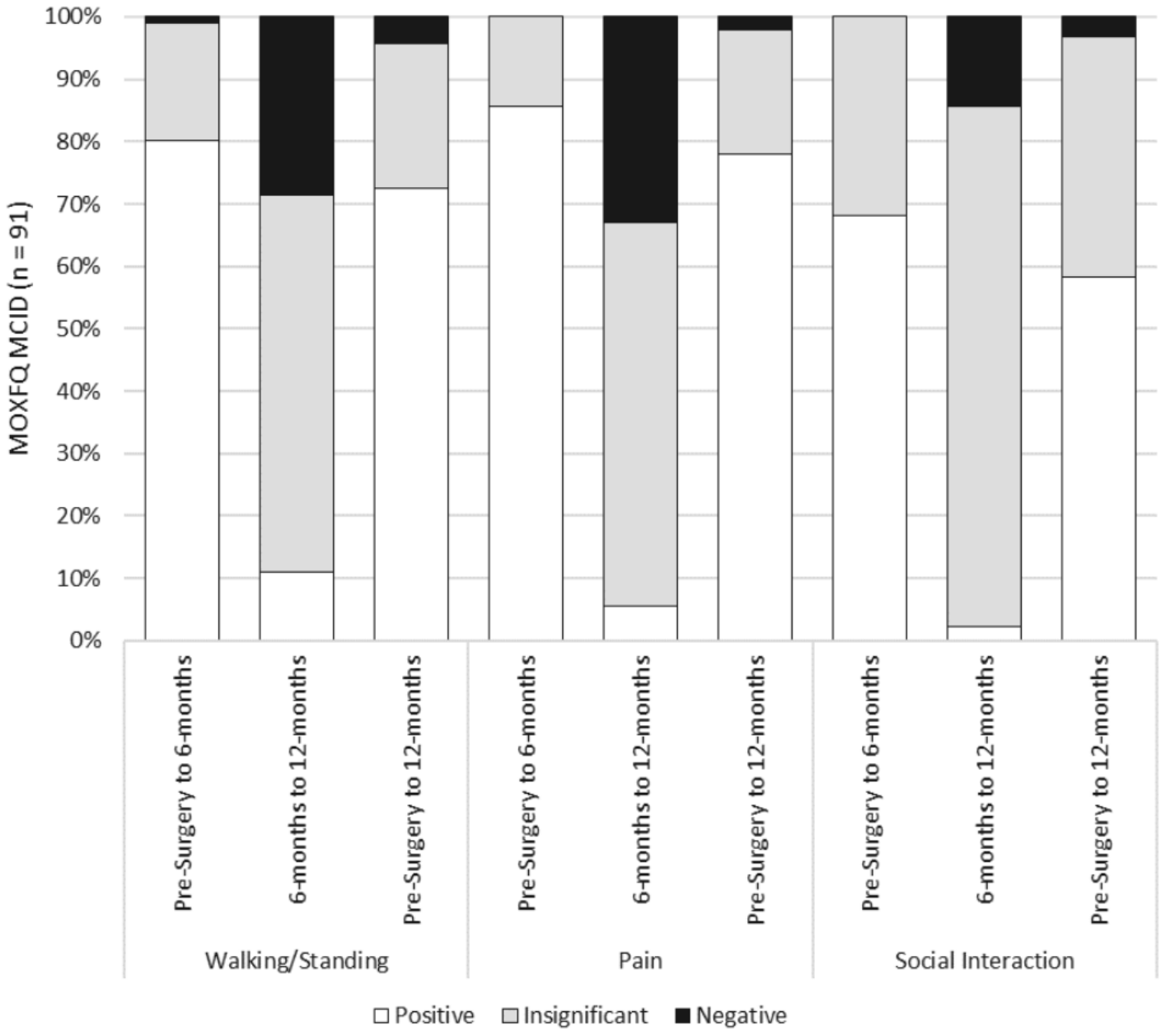


Figure 3

MCID change in domains at time points

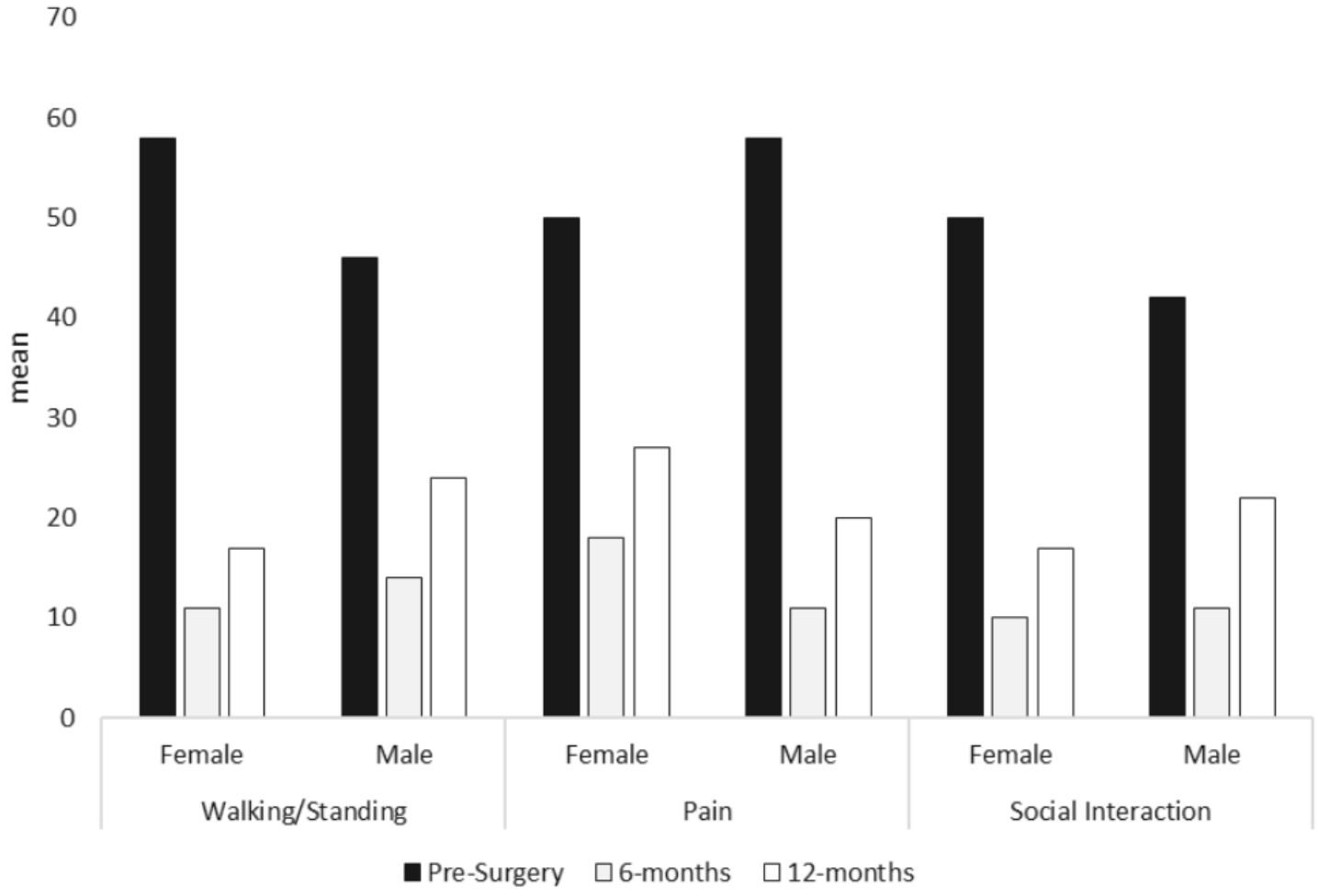


Figure 4

Domain means split by gender

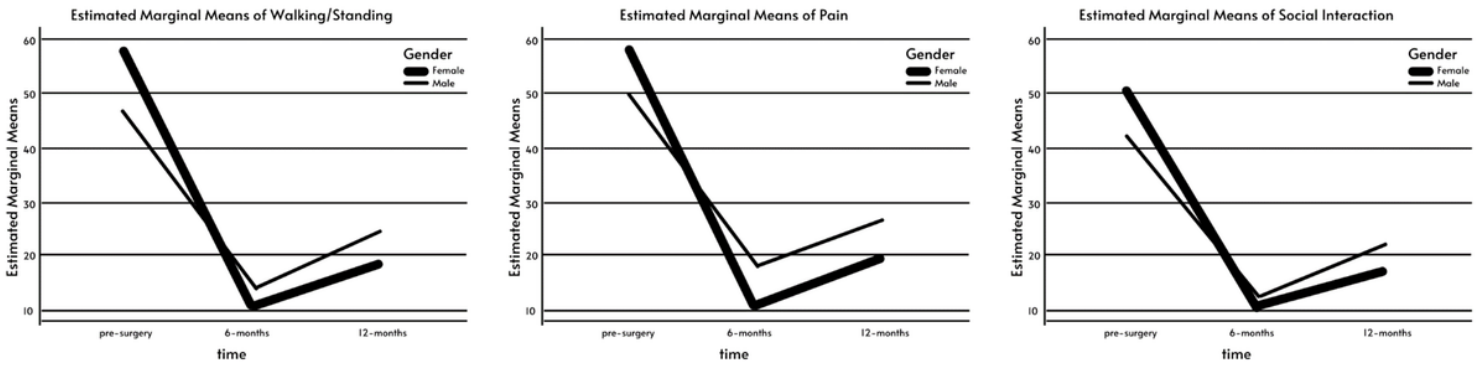


Figure 5

(a,b,c): Domains by gender at time points

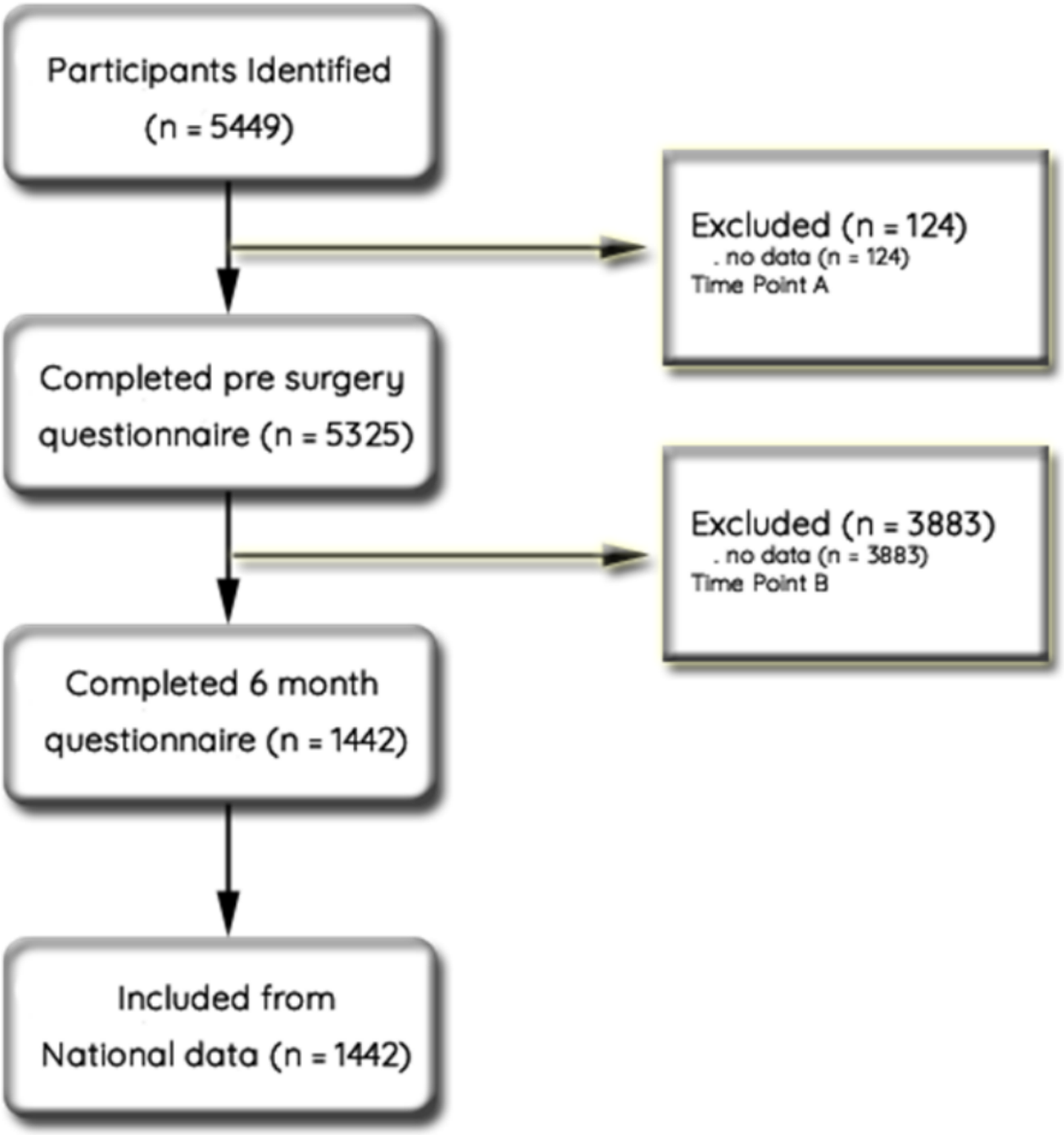


Figure 6

Data flow diagram National PASCOM Data 2019 (18)

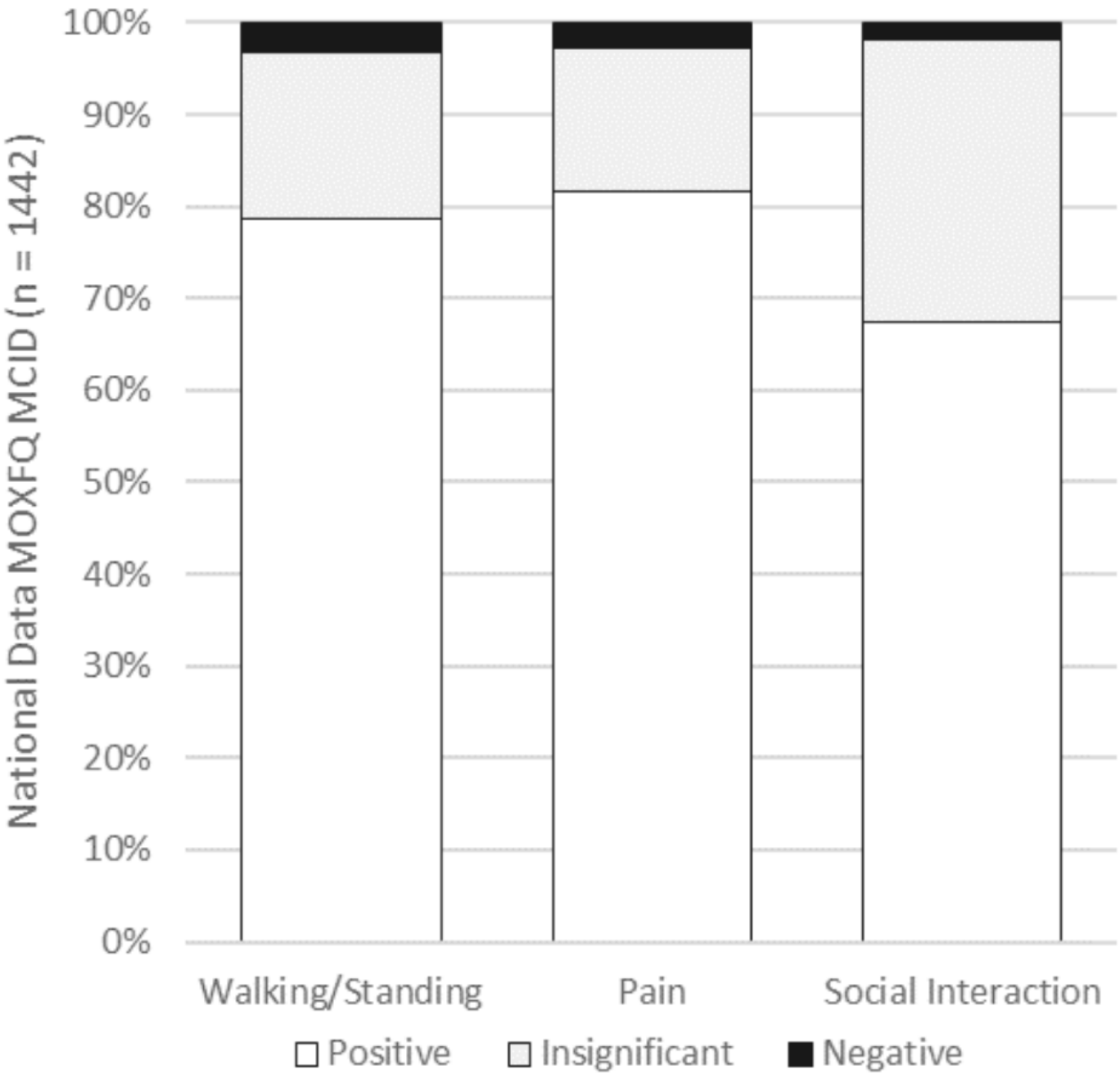


Figure 7

MCID Change in domains pre-surgery to 6-months for National PASCOM data

Supplementary Files

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- PASCOMarticlev16Supplementary.docx