

**Table S1:** Extended descriptive data for all variables

Parameter - short form	Time point	WOMAC pain ≤75 (N=157)	WOMAC pain >75 (N=469)	Total (N=626)	p value
<b>Sex</b>	ind				0.581
Male		72 (45.9%)	227 (48.4%)	299 (47.8%)	
Female		85 (54.1%)	242 (51.6%)	327 (52.2%)	
<b>Smoker</b>	ind				0.850
N-Miss		0	3	3	
No		141 (89.8%)	416 (89.3%)	557 (89.4%)	
Yes		16 (10.2%)	50 (10.7%)	66 (10.6%)	
<b>Alcohol</b>	ind				0.325
N-Miss		21	52	73	
No		123 (90.4%)	364 (87.3%)	487 (88.1%)	
Yes		13 (9.6%)	53 (12.7%)	66 (11.9%)	
<b>Age</b>	ind				0.002
Mean (SD)		65.06 (9.79)	67.62 (8.74)	66.97 (9.08)	
Range		33.00–84.00	32.00–88.00	32.00–88.00	
<b>SSD Q1</b>	ind				0.013
N-Miss		14	34	48	
Mean (SD)		6.20 (1.73)	5.74 (1.94)	5.86 (1.90)	
Range		1.00–10.00	0.00–10.00	0.00–10.00	
<b>SSD Q2</b>	ind				0.098
N-Miss		14	34	48	
Mean (SD)		6.13 (2.01)	5.79 (2.12)	5.88 (2.10)	
Range		0.00–10.00	0.00–10.00	0.00–10.00	
<b>Martial with</b>	ind				0.614
N-Miss		1	5	6	
No		30 (19.2%)	98 (21.1%)	128 (20.6%)	
Yes		126 (80.8%)	366 (78.9%)	492 (79.4%)	
<b>Higher school</b>	ind				0.926
N-Miss		2	7	9	
No		118 (76.1%)	350 (75.8%)	468 (75.9%)	
Yes		37 (23.9%)	112 (24.2%)	149 (24.1%)	
<b>Employed</b>	ind				0.325
N-Miss		21	52	73	
No		123 (90.4%)	364 (87.3%)	487 (88.1%)	
Yes		13 (9.6%)	53 (12.7%)	66 (11.9%)	
<b>Income</b>	ind				0.032
N-Miss		38	110	148	
Mean (SD)		5.15 (2.00)	5.60 (1.94)	5.49 (1.97)	
Range		1.00–8.00	1.00–8.00	1.00–8.00	
<b>Number Children</b>	ind				0.305
N-Miss		12	47	59	

Mean (SD)		1.68 (0.98)	1.78 (1.07)	1.75 (1.05)	
Range		0.00–5.00	0.00–10.00	0.00–10.00	
EQ-5D-5L	ind				0.011
N-Miss		2	11	13	
Mean (SD)		0.63 (0.19)	0.67 (0.18)	0.66 (0.18)	
Range		0.14–0.92	0.05–1.00	0.05–1.00	
OSSS	ind				< 0.001
N-Miss		1	6	7	
Mean (SD)		10.51 (2.21)	11.17 (1.96)	11.00 (2.04)	
Range		4.00–14.00	5.00–14.00	4.00–14.00	
Pre-treatment	ind				0.880
N-Miss		13	41	54	
Mean (SD)		2981.18 (4218.51)	3039.62 (3968.95)	3024.91 (4029.56)	
Range		11.00–24588.00	18.00–25032.00	11.00–25032.00	
PHQ-4	ind				< 0.001
N-Miss		12	32	44	
Mean (SD)		3.49 (2.96)	2.14 (2.28)	2.48 (2.53)	
Range		0.00–12.00	0.00–12.00	0.00–12.00	
LOT-R opt	ind				< 0.001
N-Miss		5	16	21	
Mean (SD)		9.45 (2.42)	10.46 (2.18)	10.21 (2.28)	
Range		3.00–12.00	0.00–12.00	0.00–12.00	
LOT-R pess	ind				< 0.001
N-Miss		6	16	22	
Mean (SD)		8.23 (3.06)	9.70 (2.59)	9.33 (2.79)	
Range		0.00–12.00	0.00–12.00	0.00–12.00	
KOOS pain	ind				< 0.001
N-Miss		1	4	5	
Mean (SD)		41.90 (15.72)	48.13 (17.28)	46.56 (17.10)	
Range		0.00–87.50	0.00–91.67	0.00–91.67	
KOOS symp	ind				< 0.001
N-Miss		1	3	4	
Mean (SD)		47.33 (17.55)	55.73 (19.38)	53.62 (19.28)	
Range		3.57–89.29	3.57–100.00	3.57–100.00	
KOOS ADL	ind				< 0.001
N-Miss		1	3	4	
Mean (SD)		50.54 (19.24)	57.06 (17.93)	55.42 (18.47)	
Range		1.56–98.53	4.41–95.59	1.56–98.53	
KOOS sport	ind				0.076
N-Miss		5	20	25	
Mean (SD)		16.07 (15.90)	18.95 (17.72)	18.22 (17.31)	
Range		0.00–80.00	0.00–90.00	0.00–90.00	
KOOS QoL	ind				0.159
N-Miss		3	6	9	

Mean (SD)		23.50 (14.17)	25.34 (13.96)	24.88 (14.02)	
Range		0.00–75.00	0.00–81.25	0.00–81.25	
Staffelstein	ind				0.010
N-Miss		28	66	94	
Mean (SD)		78.33 (12.43)	81.55 (12.37)	80.77 (12.45)	
Range		38.00–111.00	36.00–115.00	36.00–115.00	
WOMAC pain	ind				< 0.001
N-Miss		1	5	6	
Mean (SD)		45.80 (17.12)	53.99 (18.29)	51.93 (18.33)	
Range		0.00–90.00	0.00–95.00	0.00–95.00	
ASA	pre				0.973
N-Miss		3	2	5	
Mean (SD)		2.24 (0.52)	2.24 (0.55)	2.24 (0.54)	
Range		1.00–3.00	1.00–4.00	1.00–4.00	
SSD Q1	pre				0.482
N-Miss		57	128	185	
Mean (SD)		5.73 (1.94)	5.58 (1.82)	5.62 (1.85)	
Range		0.00–10.00	0.00–10.00	0.00–10.00	
TUG	pre				0.621
N-Miss		15	31	46	
Mean (SD)		12.38 (4.10)	12.17 (4.52)	12.22 (4.42)	
Range		6.00–29.00	6.00–49.00	6.00–49.00	
Pain rest	pre				< 0.001
N-Miss		19	46	65	
Mean (SD)		3.48 (2.44)	2.43 (2.37)	2.68 (2.43)	
Range		0.00–9.00	0.00–10.00	0.00–10.00	
Pain load	pre				0.016
N-Miss		19	47	66	
Mean (SD)		5.25 (2.30)	4.64 (2.63)	4.79 (2.56)	
Range		0.00–10.00	0.00–10.00	0.00–10.00	
ISAR	pre				0.005
N-Miss		40	97	137	
Mean (SD)		0.58 (0.84)	0.35 (0.72)	0.41 (0.76)	
Range		0.00–4.00	0.00–6.00	0.00–6.00	
PHQ-4	pre				< 0.001
N-Miss		56	124	180	
Mean (SD)		3.81 (3.17)	2.03 (2.13)	2.43 (2.52)	
Range		0.00–12.00	0.00–12.00	0.00–12.00	
Height	surg				0.986
Mean (SD)		170.92 (9.71)	170.90 (9.28)	170.91 (9.38)	
Range		148.00–198.00	136.00–198.00	136.00–198.00	
Weight	surg				0.027
Mean (SD)		90.55 (18.46)	86.90 (17.76)	87.81 (18.00)	
Range		53.00–150.00	45.00–175.00	45.00–175.00	

<b>Surg duration</b>	surg				0.128
Mean (SD)		70.17 (34.78)	65.78 (29.85)	66.88 (31.19)	
Range		17.00–278.00	23.00–243.00	17.00–278.00	
<b>Cortisone</b>	surg				0.881
No		4 (2.5%)	13 (2.8%)	17 (2.7%)	
Yes		153 (97.5%)	456 (97.2%)	609 (97.3%)	
<b>Surg tranex</b>	surg				0.619
No		14 (8.9%)	36 (7.7%)	50 (8.0%)	
Yes		143 (91.1%)	433 (92.3%)	576 (92.0%)	
<b>Intub anesthesia</b>	surg				0.480
N-Miss		52	182	234	
SPA		43 (41.0%)	129 (44.9%)	172 (43.9%)	
ITN		62 (59.0%)	158 (55.1%)	220 (56.1%)	
<b>Surg tourn</b>	surg				0.181
No		109 (69.4%)	298 (63.5%)	407 (65.0%)	
Yes		48 (30.6%)	171 (36.5%)	219 (35.0%)	
<b>Surg LIA</b>	surg				0.905
No		7 (4.5%)	22 (4.7%)	29 (4.6%)	
Yes		150 (95.5%)	447 (95.3%)	597 (95.4%)	
<b>Surg drain</b>	surg				0.866
No		154 (98.1%)	461 (98.3%)	615 (98.2%)	
Yes		3 (1.9%)	8 (1.7%)	11 (1.8%)	
<b>Walking dist</b>	post				0.188
N-Miss		89	306	395	
Mean (SD)		1.94 (0.45)	2.04 (0.52)	2.01 (0.50)	
Range		1.00–3.00	1.00–4.00	1.00–4.00	
<b>SSD Q1</b>	post				0.534
N-Miss		13	38	51	
Mean (SD)		4.85 (2.32)	4.98 (2.26)	4.95 (2.27)	
Range		0.00–9.00	0.00–10.00	0.00–10.00	
<b>SSD Q2</b>	post				0.922
N-Miss		14	42	56	
Mean (SD)		4.98 (2.65)	5.01 (2.42)	5.00 (2.48)	
Range		0.00–10.00	0.00–10.00	0.00–10.00	
<b>TUG</b>	post				0.023
N-Miss		25	87	112	
Mean (SD)		18.22 (8.26)	16.70 (5.91)	17.09 (6.62)	
Range		7.00–88.00	5.00–53.00	5.00–88.00	
<b>Pain rest</b>	post				< 0.001
N-Miss		21	73	94	
Mean (SD)		2.62 (1.90)	1.92 (1.72)	2.10 (1.79)	
Range		0.00–8.00	0.00–8.00	0.00–8.00	
<b>Pain load</b>	post				0.002
N-Miss		21	73	94	

Mean (SD)		3.89 (1.95)	3.32 (1.80)	3.46 (1.85)	
Range		0.00–9.00	0.00–8.00	0.00–9.00	
EQ-5D-5L	post				0.022
N-Miss		9	24	33	
Mean (SD)		0.76 (0.17)	0.80 (0.15)	0.79 (0.15)	
Range		0.17–1.00	0.26–1.00	0.17–1.00	
LOS	post				0.637
Mean (SD)		5.46 (2.61)	5.35 (2.53)	5.38 (2.55)	
Range		2.00–24.00	2.00–37.00	2.00–37.00	
PHQ-4	post				< 0.001
N-Miss		12	33	45	
Mean (SD)		2.71 (2.79)	1.71 (2.10)	1.96 (2.33)	
Range		0.00–12.00	0.00–12.00	0.00–12.00	
Staffelstein	post				0.191
N-Miss		8	15	23	
Mean (SD)		76.10 (14.54)	77.97 (15.36)	77.51 (15.17)	
Range		29.00–110.00	25.00–119.00	25.00–119.00	
EQ-5D-5L	rehab				< 0.001
N-Miss		57	187	244	
Mean (SD)		0.77 (0.14)	0.84 (0.11)	0.82 (0.12)	
Range		0.36–1.00	0.21–1.00	0.21–1.00	
TUG	rehab				0.752
N-Miss		98	313	411	
Mean (SD)		10.86 (3.68)	11.08 (4.63)	11.02 (4.39)	
Range		5.00–22.00	5.00–44.00	5.00–44.00	
Pain rest	rehab				0.001
N-Miss		93	301	394	
Mean (SD)		2.28 (1.85)	1.50 (1.51)	1.72 (1.65)	
Range		0.00–8.00	0.00–6.00	0.00–8.00	
Pain load	rehab				0.002
N-Miss		94	301	395	
Mean (SD)		3.68 (1.94)	2.86 (1.71)	3.09 (1.81)	
Range		0.00–8.00	0.00–8.00	0.00–8.00	
PHQ-4	rehab				< 0.001
N-Miss		57	188	245	
Mean (SD)		2.49 (2.12)	1.04 (1.73)	1.42 (1.95)	
Range		0.00–8.00	0.00–12.00	0.00–12.00	
rehab duration	rehab				0.498
N-Miss		56	178	234	
Mean (SD)		23.07 (5.24)	21.84 (4.26)	22.16 (4.56)	
Range		12.00–52.00	4.00–42.00	4.00 - 52.00	
Staffelstein	rehab				< 0.001
N-Miss		86	231	317	
Mean (SD)		85.04 (12.36)	92.43 (13.21)	90.73 (13.37)	
Range		48.00–109.00	47.00–120.00	47.00–120.00	

<b>SSD Q1</b>	3mo				< 0.001
N-Miss		15	49	64	
Mean (SD)		4.21 (1.88)	2.72 (1.97)	3.10 (2.05)	
Range		0.00–8.00	0.00–9.00	0.00–9.00	
<b>EQ-5D-5L</b>	3mo				< 0.001
N-Miss		12	41	53	
Mean (SD)		0.74 (0.18)	0.87 (0.11)	0.84 (0.14)	
Range		0.07–1.00	0.26–1.00	0.07–1.00	
<b>KOOS pain</b>	3mo				< 0.001
N-Miss		11	31	42	
Mean (SD)		55.16 (17.13)	75.76 (15.37)	70.61 (18.16)	
Range		5.56–100.00	36.11–100.00	5.56–100.00	
<b>KOOS symp</b>	3mo				< 0.001
N-Miss		11	29	40	
Mean (SD)		54.06 (17.52)	72.40 (15.05)	67.83 (17.58)	
Range		17.86–96.43	28.57–100.00	17.86–100.00	
<b>KOOS ADL</b>	3mo				< 0.001
N-Miss		11	31	42	
Mean (SD)		60.62 (16.21)	79.64 (13.60)	74.88 (16.49)	
Range		11.76–95.59	26.56–100.00	11.76–100.00	
<b>KOOS sport</b>	3mo				< 0.001
N-Miss		29	94	123	
Mean (SD)		29.41 (21.90)	49.59 (25.18)	44.46 (25.91)	
Range		0.00–80.00	0.00–100.00	0.00–100.00	
<b>KOOS QoL</b>	3mo				< 0.001
N-Miss		9	32	41	
Mean (SD)		36.53 (19.02)	56.66 (20.86)	51.56 (22.19)	
Range		0.00–93.75	0.00–100.00	0.00–100.00	
<b>WOMAC pain</b>	3mo				< 0.001
N-Miss		11	31	42	
Mean (SD)		59.90 (17.48)	79.86 (14.38)	74.87 (17.49)	
Range		10.00–100.00	40.00–100.00	10.00–100.00	
<b>PHQ-4</b>	3mo				< 0.001
N-Miss		20	64	84	
Mean (SD)		2.97 (2.86)	1.09 (1.90)	1.57 (2.33)	
Range		0.00–12.00	0.00–12.00	0.00–12.00	
<b>SSD Q1</b>	6mo				< 0.001
N-Miss		22	51	73	
Mean (SD)		4.16 (1.95)	2.24 (1.85)	2.71 (2.05)	
Range		0.00–9.00	0.00–10.00	0.00–10.00	
<b>SSD Q2</b>	6mo				< 0.001
N-Miss		23	56	79	
Mean (SD)		4.13 (2.14)	2.08 (1.93)	2.59 (2.17)	
Range		0.00–9.00	0.00–10.00	0.00–10.00	
<b>EQ-5D-5L</b>	6mo				< 0.001
N-Miss		20	36	56	

Mean (SD)		0.75 (0.18)	0.90 (0.11)	0.86 (0.14)	
Range		0.04–1.00	0.14–1.00	0.04–1.00	
PHQ-4	6mo				< 0.001
N-Miss		27	62	89	
Mean (SD)		2.88 (2.66)	0.93 (1.64)	1.40 (2.11)	
Range		0.00–11.00	0.00–12.00	0.00–12.00	
KOOS pain	6mo				< 0.001
N-Miss		16	19	35	
Mean (SD)		58.34 (16.85)	82.80 (13.86)	76.96 (17.95)	
Range		16.67–100.00	33.33–100.00	16.67–100.00	
KOOS symp	6mo				< 0.001
N-Miss		17	20	37	
Mean (SD)		58.21 (14.42)	78.81 (14.61)	73.91 (17.00)	
Range		14.29–89.29	28.57–100.00	14.29–100.00	
KOOS ADL	6mo				< 0.001
N-Miss		19	21	40	
Mean (SD)		62.72 (15.65)	84.16 (12.55)	79.11 (16.15)	
Range		20.59–92.65	35.29–100.00	20.59–100.00	
KOOS sport	6mo				< 0.001
N-Miss		28	60	88	
Mean (SD)		32.29 (21.60)	58.92 (23.32)	52.53 (25.57)	
Range		0.00–85.00	0.00–100.00	0.00–100.00	
KOOS QoL	6mo				< 0.001
N-Miss		16	22	38	
Mean (SD)		40.65 (19.52)	65.57 (20.48)	59.59 (22.87)	
Range		0.00–91.67	0.00–100.00	0.00–100.00	
WOMAC pain	6mo				< 0.001
N-Miss		16	19	35	
Mean (SD)		63.05 (17.17)	86.01 (12.99)	80.53 (17.16)	
Range		20.00–100.00	25.00–100.00	20.00–100.00	
SSD Q1	1y				< 0.001
N-Miss		11	23	34	
Mean (SD)		3.95 (2.07)	1.84 (1.81)	2.36 (2.09)	
Range		0.00 - 10.00	0.00 - 9.00	0.00 - 10.00	
SSD Q2	1y				< 0.001
N-Miss		10	23	33	
Mean (SD)		4.03 (2.28)	1.64 (1.80)	2.24 (2.19)	
Range		0.00 - 10.00	0.00 - 10.00	0.00 - 10.00	
EQ-5D-5L	1y				< 0.001
N-Miss		8	20	28	
Mean (SD)		0.75 (0.18)	0.93 (0.10)	0.89 (0.14)	
Range		0.09 - 1.00	0.26 - 1.00	0.09 - 1.00	
PHQ-4	1y				< 0.001
N-Miss		13	41	54	
Mean (SD)		2.74 (2.99)	0.80 (1.49)	1.29 (2.15)	
Range		0.00 - 12.00	0.00 - 10.00	0.00 - 12.00	
KOOS symp	1y				< 0.001
N-Miss		3	3	6	
Mean (SD)		61.51 (15.61)	84.79 (12.11)	79.01 (16.48)	

Range		14.29 - 95.83	42.86 - 100.00	14.29 - 100.00	
<b>KOOS ADL</b>	1y				< 0.001
N-Miss		0	2	2	
Mean (SD)		62.81 (16.35)	90.22 (9.15)	83.32 (16.47)	
Range		6.67 - 100.00	45.59 - 100.00	6.67 - 100.00	
<b>KOOS sport</b>	1y				< 0.001
N-Miss		14	56	70	
Mean (SD)		35.57 (24.58)	67.68 (21.08)	59.42 (26.11)	
Range		0.00 - 90.00	0.00 - 100.00	0.00 - 100.00	
<b>KOOS Qol</b>	1y				< 0.001
N-Miss		2	6	8	
Mean (SD)		42.31 (18.54)	72.95 (18.71)	65.26 (22.90)	
Range		0.00 - 87.50	18.75 - 100.00	0.00 - 100.00	



**Table S2:** Details for the prediction model based on preoperative data, non-standardized and standardized, using LASSO min

<b>Using non-standardized data</b>				
(Intercept)	Alcohol, ind	Age, ind	Marital with, ind	Higher school, pre
-1.238	0.040	0.014	-0.069	-0.018
Number children, ind	OSSS, ind	LOT-R opt, ind	LOT-R pess. ind	KOOS symp, ind
0.019	0.037	0.031	0.08	0.005
KOOS QoL, ind	WOMAC pain, ind	SSD Q1, pre	TUG, pre	VAS rest, pre
-0.003	0.003	0.05	-0.003	-0.09
ISAR, pre	PHQ-4, pre			
-0.05	-0.1			
<b>Using standardized data</b>				
(Intercept)	Alcohol, ind	Age, ind	Marital with, ind	Higher school, pre
1.065	0.013	0.133	-0.030	-0.008
Number children, ind	OSSS, ind	LOT-R opt, ind	LOT-R pess. ind	KOOS symp, ind
0.021	0.078	0.072	0.2	0.1
KOOS QoL, ind	WOMAC pain, ind	SSD Q1, pre	TUG, pre	VAS rest, pre
-0.04	0.05	0.09	-0.02	-0.2
ISAR, pre	PHQ-4, pre			
-0.04	-0.4			

**Table S3:** Details for the prediction model based on data up to 6 month after surgery, non-standardized and standardized, using LASSO min

<b>Using non-standardized data</b>				
(Intercept)	Number children, ind	LOT-R pess, ind	KOOS QoL, ind	SSD Q1, pre
-6.01	0.02	0.04	-0.004	0.01
TUG, pre	VAS rest, pre	PHQ-4, pre	Cortisone, surg	Walking dist, post
-0.0002	-0.05	-0.08	0.2	0.09
SSD Q1, post	VAS load, post	SSD Q2, rehab	TUG, rehab	VAS rest, rehab
0.07	0.01	-0.02	0.003	-0.01
VAS load, rehab	Staffelstein, rehab	SSD Q2, 3 mo	KOOS pain, 3 mo	KOOS ADL, 3 mo
-0.04	0.01	-0.01	0.01	0.01
WOMAC pain, 3 mo	EQ-5D-5L, 6 mo	PHQ-4, 6 mo	KOOS symp, 6 mo	KOOS ADL, 6 mo
0.01	0.46	-0.05	0.02	0.01
KOOS sport, 6 mo	WOMAC pain, 6 mo			
0.01	0.02			
<b>Using standardized data</b>				
(Intercept)	Number children, ind	LOT-R pess, ind	KOOS QoL, ind	SSD Q1, pre
1.29	0.02	0.12	-0.05	0.01
TUG, pre	VAS rest, pre	PHQ-4, pre	Cortisone, surg	Walking dist, post
-0.0009	-0.13	-0.21	0.03	0.05
SSD Q1, post	VAS load, post	SSD Q2, rehab	TUG, rehab	VAS rest, rehab
0.18	0.01	-0.05	0.01	-0.01
VAS load, rehab	Staffelstein, rehab	SSD Q2, 3 mo	KOOS pain, 3 mo	KOOS ADL, 3 mo
-0.08	0.14	-0.02	0.09	0.1
WOMAC pain, 3 mo	EQ-5D-5L, 6 mo	PHQ-4, 6 mo	KOOS symp, 6 mo	KOOS ADL, 6 mo
0.21	0.07	-0.11	0.36	0.15
KOOS sport, 6 mo	WOMAC pain, 6 mo			
0.15	0.32			