

Supplementary Information

Supplement table S1. Correlations between baseline variables

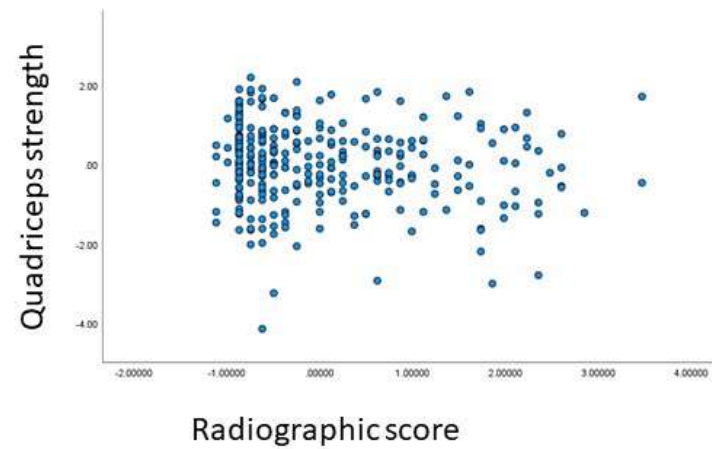
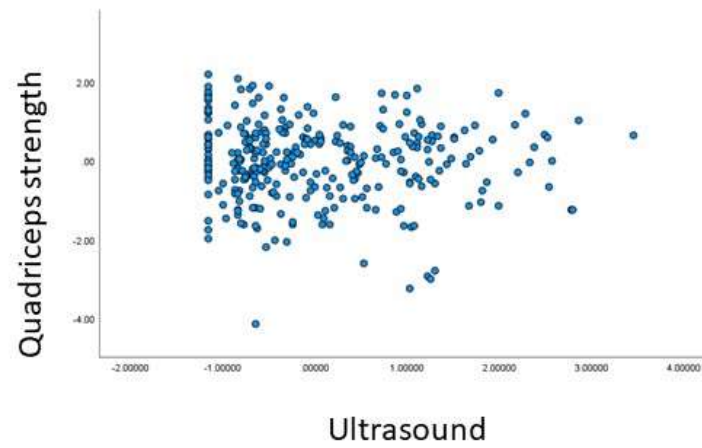
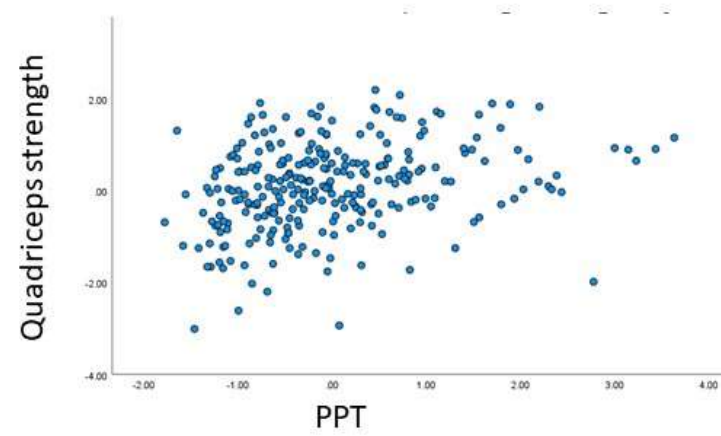
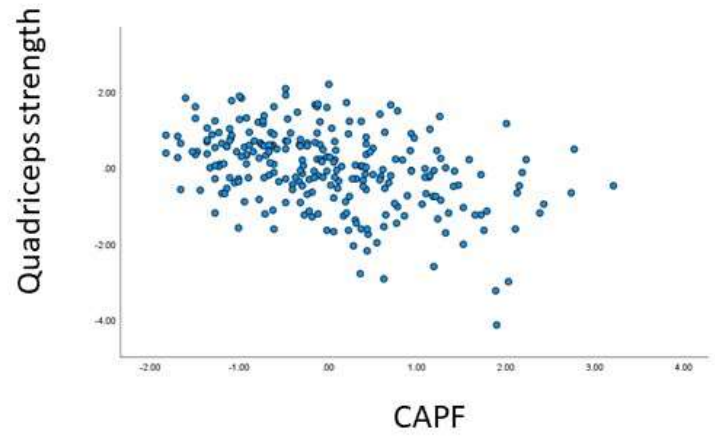
		Quad strength	Handgrip strength	PPT	CAPF	Radiography (NLDA)	Osteophyte	JSN	Ultrasound	US effusion	US hypertrophy	US doppler	Average 4 week knee pain	BMI	Sex
Handgrip strength	rho	.570**													
	p	<0.001													
	N	311													
PPT	rho	.324**	.353**												
	p	<0.001	<0.001												
	N	271	273												
CAPF	rho	-.397**	-.284**	-.204**											
	p	<0.001	<0.001	0.002											
	N	258	262	225											
Radiography (NLDA)	rho	-.150**	-.118*	-.125*	0.075										
	p	0.009	0.038	0.041	0.231										
	N	307	309	270	256										
Osteophyte	rho	-0.108	-0.06	-.132*	0.071	.961**									
	p	0.058	0.292	0.03	0.259	<0.001									
	N	307	309	270	256	310									
JSN	rho	-.150**	-.193**	-0.087	0.06	.815**	.661**								
	p	0.009	0.001	0.153	0.338	<0.001	<0.001								
	N	307	309	270	256	310	310								
Ultrasound	rho	-0.059	0.014	-0.105	0.012	.513**	.504**	.418**							
	p	0.304	0.804	0.084	0.845	<0.001	<0.001	<0.001							
	N	309	311	271	258	307	307	307							
US effusion	rho	-0.062	0.012	-0.077	-0.007	.529**	.505**	.447**	.951**						
	p	0.276	0.838	0.208	0.914	<0.001	<0.001	<0.001	<0.001						
	N	309	311	271	258	307	307	307	312						
US hypertrophy	rho	-0.024	0.009	-.144*	0.033	.450**	.457**	.349**	.882**	.718**					
	p	0.669	0.88	0.018	0.6	<0.001	<0.001	<0.001	<0.001	<0.001					
	N	309	311	271	258	307	307	307	312	312					

US Doppler	rho	.121*	0.11	.125*	-.128*	0.035	0.024	0.024	.207**	.179**	.186**				
	p	0.032	0.052	0.039	0.04	0.545	0.675	0.675	<0.001	0.001	0.001				
	N	312	314	274	260	310	310	310	312	312	312				
Average 4 week knee pain	r	-.359**	-.158**	-.215**	.562**	.246**	.243**	.199**	.128*	.131*	0.106	-.120*			
	p	<0.001	0.005	<0.001	<0.001	<0.001	<0.001	<0.001	0.024	0.02	0.061	0.033			
	N	312	317	274	264	310	310	310	312	312	312	315			
BMI	rho	-.123*	-0.077	-.185**	.290**	.136*	.165**	0.059	0.099	0.089	0.104	-.203**	.226**		
	p	0.035	0.178	0.003	<0.001	0.02	0.004	0.315	0.09	0.126	0.074	<0.001	<0.001		
	N	296	304	260	251	295	295	295	296	296	296	299	303		
Sex	rho	-.405**	-.690**	-.270**	.155*	-0.038	-0.1	0.089	-.169**	-.151**	-.161**	-.151**	0.109	.117*	
	p	<0.001	<0.001	<0.001	0.012	0.507	0.078	0.118	0.003	0.008	0.004	0.007	0.052	0.042	
	N	312	320	274	264	310	310	310	312	312	312	315	319	306	
Age	rho	0.057	-.123*	0.01	-.140*	.341**	.292**	.358**	.172**	.174**	.153**	0.101	-.152**	-.173**	-.158**
	p	0.317	0.028	0.871	0.023	<0.001	<0.001	<0.001	0.002	0.002	0.007	0.073	0.006	0.002	0.004
	N	312	320	274	264	310	310	310	312	312	312	315	319	306	322

Spearman's rho, p and n= for baseline variables. Significance is shown in bold. **Correlation is significant at the 0.01 level(2-tailed). *Correlation is significant at the 0.05 level(2-tailed). *Post hoc* analysis indicated ≥82% power to detect a correlation coefficient ≥0.18 at baseline in bivariate analyses. BMI: body mass index; CAPF: central aspects of pain factor; PPT: pressure pain threshold (proximal tibial); JSN=joint space narrowing; US=ultrasound; sex: male=1 and female=2.

Supplementary Figure S1:

Scatterplots showing associations with quadriceps strength at baseline



Supplement table S2: Correlation of baseline variables with year 1 muscle strength

		Quad strength 1 year	Handgrip strength 1 year
Quad strength baseline	rho	.323**	
	p	<0.001	
	N	158	
Handgrip strength 1 year	rho	.486**	
	p	<0.001	
	N	162	
Handgrip strength baseline	rho	.515**	.864**
	p	<0.001	<0.001
	N	161	165
PPT	rho	0.149	.189*
	p	0.066	0.019
	N	153	153
CAPF	rho	-.263**	-.340**
	p	0.003	<0.001
	N	126	128
Radiography	rho	-0.114	-0.051
	p	0.153	0.524
	N	158	158
Osteophyte	rho	-0.088	0.003
	p	0.269	0.972
	N	158	158
JSN	rho	-0.093	-0.057
	p	0.244	0.474
	N	158	158
Ultrasound	rho	0.044	0.133
	p	0.581	0.095
	N	159	159
US effusion	rho	0.015	0.095
	p	0.847	0.235
	N	159	159
US hypertrophy	rho	0.064	0.154
	p	0.424	0.053
	N	159	159
US Doppler	rho	-0.059	0.136
	p	0.46	0.086
	N	161	161
Average 4 week knee pain	r	-0.099	-0.093
	p	0.212	0.236
	N	162	164

BMI	rho	-0.083	-0.141
	p	0.304	0.076
	N	155	159
Sex	rho	-.448**	-.682**
	p	<0.001	<0.001
	N	162	166
Age	rho	-0.139	-.159*
	p	0.077	0.041
	N	162	166

**Correlation is significant at the 0.01 level(2-tailed). *Correlation is significant at the 0.05 level(2-tailed). Post hoc analysis indicated $\geq 80\%$ power to detect $r \geq 0.26$ between baseline variables and year 1 quadriceps strength in bivariate analyses. BMI: body mass index; CAPF: central aspects of pain factor; PPT: pressure pain threshold (proximal tibial); JSN=joint space narrowing; US=ultrasound; sex: male=1 and female=2.

Supplement table S3: Examining the component items of the Central aspects of pain factor and their association with muscle strength.

Each individual item from the CAPF was assessed for its Spearmans correlations with muscle strength at baseline and at 1 year follow up. 95% CI were calculated from 1000 bootstrap draws.

		Baseline		1 year	
		Quad	Handgrip	Quad	Handgrip
Anxiety	rho	-0.20	-0.19	-0.11	-0.14
	95% CI	(-0.31 to -0.09)	(-0.30 to -0.07)	(-0.26 to 0.05)	(-0.29 to 0.01)
	p	<0.001	0.001	0.173	0.068
Depression	rho	-0.19	-0.05	-0.07	-0.10
	95% CI	(-0.29 to -0.08)	(-0.16 to 0.06)	(-0.21 to 0.08)	(-0.25 to 0.06)
	p	0.001	0.400	0.349	0.225
Neuropathic-like	rho	-0.28	-0.22	-0.25	-0.29
	95% CI	(-0.39 to -0.17)	(-0.32 to -0.10)	(-0.40 to -0.11)	(-0.42 to -0.14)
	p	<0.001	<0.001	0.002	<0.001
Cognition	rho	-0.33	-0.19	-0.14	-0.14
	95% CI	(-0.42 to -0.23)	(-0.30 to -0.08)	(-0.29 to 0.01)	(-0.30 to 0.02)
	p	<0.001	0.001	0.074	0.069
Widespread pain	rho	-0.12	-0.10	-0.18	-0.17
	95% CI	(-0.23 to -0.01)	(-0.21 to 0.01)	(-0.32 to -0.02)	(-0.33 to -0.01)
	p	0.030	0.068	0.025	0.034
Catastrophizing	rho	-0.24	-0.07	-0.09	-0.07
	95% CI	(-0.35 to -0.13)	(-0.18 to 0.04)	(-0.24 to 0.07)	(-0.21 to 0.09)
	p	<0.001	0.210	0.253	0.402
Sleep	rho	-0.34	-0.18	-0.22	-0.22
	95% CI	(-0.45 to -0.24)	(-0.30 to -0.06)	(-0.40 to -0.04)	(-0.36 to -0.06)
	p	<0.001	0.002	0.010	0.009
Fatigue	rho	-0.29	-0.19	-0.10	-0.19
	95% CI	(-0.39 to -0.19)	(-0.29 to -0.08)	(-0.25 to 0.05)	(-0.34 to -0.03)
	p	<0.001	0.001	0.202	0.013

Supplementary table S4: Regression for year 1 quadriceps strength with hypertrophy replacing total ultrasound score

	B	95% Confidence Interval for B		p
		Lower Bound	Upper Bound	
Age	-0.23	-0.47	0.00	0.053
Female	-0.18	-0.41	0.06	0.146
BML	0.04	-0.21	0.29	0.753
Baseline quad strength	0.21	-0.03	0.44	0.084
CAPF	-0.29	-0.56	-0.03	0.032
PPT	0.07	-0.14	0.29	0.501
US hypertrophy	0.17	-0.15	0.48	0.295
NLDA	0.04	-0.23	0.30	0.789

Supplementary table S5: Regression for year 1 quadriceps strength with effusion replacing total ultrasound score

	B	95% Confidence Interval for B		p
		Lower Bound	Upper Bound	
Age	-0.22	-0.46	0.01	0.059
Female	-0.18	-0.41	0.06	0.142
BMI	0.03	-0.22	0.28	0.825
Baseline quad strength	0.22	-0.02	0.46	0.069
CAPF	-0.28	-0.55	-0.01	0.040
PPT	0.06	-0.15	0.27	0.568
US effusion	0.13	-0.11	0.37	0.287
NLDA	0.02	-0.26	0.30	0.900

Supplementary table S6: Regression for year 1 quadriceps strength with doppler replacing total ultrasound score

	B	95% Confidence Interval for B		p
		Lower Bound	Upper Bound	
Age	-0.22	-0.45	0.01	0.059
Female	-0.24	-0.47	-0.02	0.034
BMI	0.01	-0.24	0.26	0.949
Baseline quad strength	0.20	-0.04	0.43	0.095
CAPF	-0.32	-0.58	-0.05	0.019
PPT	0.04	-0.16	0.24	0.706
US doppler	-0.08	-0.25	0.10	0.393
NLDA	0.11	-0.12	0.35	0.353

Supplementary table S7: Regression for year 1 quadriceps strength with joint space narrowing (JSN) replacing total radiography score

	B	95% Confidence Interval for B		p
		Lower Bound	Upper Bound	
Age	-0.25	-0.48	-0.01	0.040
Female	-0.18	-0.42	0.06	0.146
BMI	0.03	-0.22	0.27	0.831
Baseline quad strength	0.22	-0.02	0.46	0.067
CAPF	-0.30	-0.57	-0.03	0.032
PPT	0.06	-0.15	0.27	0.572
US	0.13	-0.13	0.39	0.326
JSN	0.10	-0.18	0.39	0.477

Supplementary table S8: Regression for year 1 quadriceps strength with osteophyte (OST) replacing total radiography score

	B	95% Confidence Interval for B		p
		Lower Bound	Upper Bound	
Age	-0.23	-0.46	0.01	0.055
Female	-0.16	-0.40	0.08	0.176
BMI	0.04	-0.21	0.29	0.76
Baseline quad strength	0.22	-0.02	0.46	0.070
CAPF	-0.28	-0.55	-0.01	0.041
PPT	0.07	-0.14	0.28	0.508
US	0.17	-0.11	0.44	0.225
OST	-0.01	-0.29	0.27	0.962