

Supplementary Table S1. Comorbidities of the study population, stratified by BMI category.

	Normal weight (N = 154)	Underweight (N = 5)	P value		Overweight (N = 111)	P value		Obese (N = 55)	P value	
	Raynaud's phenomenon, n (%)	51 (33.1)	3 (60.0)	0.233		23 (20.7)	0.028		8 (14.5)	0.011
Secondary Sjögren's syndrome, n (%)	31 (20.1)	0	0.983		26 (23.4)	0.520		15 (27.3)	0.274	
Use of levothyroxine (ever), n (%)	18 (11.7)	0	0.989		21 (18.9)	0.104		9 (16.4)	0.377	
Use of antidepressants (ever), n (%)	22 (14.3)	0	0.989		16 (14.4)	0.976		12 (21.8)	0.197	
Use of antihypertensive drugs (ever), n (%)	56 (36.4)	3 (60.0)	0.298		60 (54.1)	0.004		38 (69.1)	<0.001	
Use of lipid-lowering drugs (ever), n (%)	21 (13.6)	0	0.989		18 (16.2)	0.559		17 (30.9)	0.005	

P values derived from univariable logistic regression models with the normal weight group as reference.

Supplementary Table S2. Comorbidities of the study population, stratified by smoking status.

	Never smoker (N = 172)	Former smoker (N = 103)		Current smoker (N = 39)	
			P value		P value
Raynaud's phenomenon, n (%)	42 (24.4)	26 (25.2)	0.878	15 (38.5)	0.078
Secondary Sjögren's syndrome, n (%)	35 (20.3)	24 (23.3)	0.564	10 (25.6)	0.467
Use of levothyroxine (ever), n (%)	27 (15.7)	12 (11.7)	0.353	7 (17.9)	0.730
Use of antidepressants (ever), n (%)	21 (12.2)	20 (19.4)	0.107	8 (20.5)	0.179
Use of antihypertensive drugs (ever), n (%)	71 (41.3)	61 (59.2)	0.004	19 (48.7)	0.397
Use of lipid-lowering drugs (ever), n (%)	24 (14.0)	22 (21.4)	0.114	7 (17.9)	0.526

P values derived from univariable logistic regression models with the never smoker group as reference.

Supplementary Table S3. Comparisons of patient-reported outcomes between SLE cases and population-based non-SLE matched controls.

	SLE cases (N= 325)	Matched controls (N= 224)	P value
Age (years), median (IQR)	50.1 (36.6–66.6)	45.0 (37.0–60.0)	0.053
Women, n (%)	278 (85.5)	181 (80.8)	0.175
VAS fatigue (mm), median (IQR)	38.0 (13.0–67.5)	20.0 (10.0–41.5)	<0.001
VAS pain (mm), median (IQR)	22.0 (7.0–48.3)	7.00 (0–19.3)	<0.001
VAS overall health state/SLE- related health state (mm), median (IQR)	29.0 (7.0–53.0)	10.0 (2.8–23.0)	<0.001
HAQ-DI, median (IQR)	0.25 (0–0.75)	0 (0–0)	<0.001
EQ-5D-3L index score, median (IQR)	0.73 (0.64–0.80)	1.00 (0.80–1.00)	<0.001
EQ-5D-3L full health state, n (%)	62 (19.1)	111 (49.6)	<0.001

EQ-5D-3L: 3-level EQ-5D; HAQ-DI: Health Assessment Questionnaire Disability Index;
IQR: interquartile range; SLE: systemic lupus erythematosus; VAS: visual analogue scale.

Supplementary Table S4. Linear regression models for the associations between BMI and different patient-reported outcomes, disease activity, and organ damage.

	Unstandardised coefficient	Standardised coefficient	Standard error	P value
Unadjusted models				
VAS fatigue	0.947	0.151	0.352	0.007
VAS pain	0.996	0.180	0.307	0.001
VAS overall SLE-related health state	0.714	0.125	0.320	0.026
EQ-5D-3L	-0.008	-0.130	0.004	0.019
HAQ-DI	0.021	0.163	0.007	0.003
cSLEDAI-2K	-0.138	-0.178	0.043	0.001
SDI	0.025	0.062	0.023	0.278
Adjusted models				
VAS fatigue	1.101	0.176	0.372	0.003
VAS pain	1.171	0.214	0.319	<0.001
VAS overall SLE-related health state	0.945	0.166	0.322	0.004
EQ-5D-3L	-0.011	-0.165	0.113	<0.001
HAQ-DI	0.022	0.169	0.007	0.002
cSLEDAI-2K	-0.106	-0.136	0.044	0.017
SDI	-0.029	-0.071	0.020	0.154

Adjusted models: adjusted for age, sex, disease duration, SDI, cSLEDAI-2K.

BMI: body mass index; cSLEDAI-2K: clinical SLE Disease Activity Index 2000; EQ-5D-3L: 3-level EQ-5D; HAQ-DI: Health Assessment Questionnaire Disability Index; SDI: SLICC/ACR Damage Index; SLE: systemic lupus erythematosus; VAS: visual analogue scale.

Supplementary Table S5. Linear regression models for the associations between smoking status and different patient-reported outcomes, disease activity, and organ damage.

	Smoking status*	Unstandardised coefficient	Standardised coefficient	Standard error	P value
Unadjusted models					
VAS fatigue	F	7.73	0.12	3.70	0.037
	C	17.11	0.19	5.19	0.001
VAS pain	F	4.55	0.08	3.23	0.161
	C	16.10	0.20	4.56	<0.001
VAS overall SLE-related health state	F	5.24	0.09	3.39	0.124
	C	9.94	0.12	4.78	0.038
EQ-5D-3L	F	-0.096	-0.151	0.037	0.019
	C	-0.112	-0.125	0.052	0.009
HAQ-DI	F	0.13	0.10	0.08	0.081
	C	0.28	0.15	0.11	0.010
cSLEDAI-2K	F	-0.04	0.00	0.46	0.938
	C	0.10	0.01	0.66	0.879
SDI	F	0.60	0.16	0.23	0.009
	C	0.01	0.00	0.32	0.982
Adjusted models					
VAS fatigue	F	9.39	0.15	3.81	0.014
	C	17.21	0.20	5.19	0.001
VAS pain	F	5.42	0.10	3.32	0.103
	C	15.84	0.20	4.53	<0.001
VAS overall SLE-related health state	F	5.79	0.10	3.36	0.086
	C	9.50	0.12	4.60	0.040
EQ-5D-3L	F	-0.078	-0.12	0.037	0.038
	C	-0.110	-0.12	0.051	0.031
HAQ-DI	F	0.06	0.05	0.07	0.416
	C	0.27	0.15	0.10	0.006
cSLEDAI-2K	F	0.15	0.02	0.47	0.751
	C	0.34	0.03	0.65	0.596
SDI	F	0.33	0.08	0.20	0.097
	C	-0.05	-0.01	0.27	0.849

Adjusted models: age, sex, disease duration, SDI, cSLEDAI-2K.

cSLEDAI-2K: clinical SLE Disease Activity Index 2000; EQ-5D-3L: 3-level EQ-5D; HAQ-DI: Health Assessment Questionnaire Disability Index; SDI: SLICC/ACR Damage Index; SLE: systemic lupus erythematosus; VAS: visual analogue scale.

* C: current smoker; F: former smoker. Reference: never smoker.

Supplementary Table S6. Interaction between obesity and smoking status for unacceptable levels of fatigue.

	Non-smoker	Ever smoker	Effect of smoking ever within the strata of obese
Non-obese	1.0 (reference)	2.1 (1.2 to 3.7) p=0.010	2.1 (1.2 to 3.7) p=0.010
Obese	2.8 (1.1 to 6.8) p=0.028	2.4 (1.0 to 5.5) p=0.047	0.9 (0.3 to 2.6) p=0.794
Effect of obese within the strata of smoking ever	2.8 (1.1 to 6.8) p=0.028	1.1 (0.5 to 2.6) p=0.801	
Effect modification on multiplicative scale (95% CI): 0.4 (0.1 to 1.4) p=0.156			
Effect modification on additive scale (RERI; 95% CI): -1.5 (-4.7 to 1.6) p=0.826			

Data are presented as individual and joint odds ratios (95% confidence interval), with non-smoker and non-obese as the reference. Measures of additive and multiplicative effect modification are provided.

RERI: Relative Excess Risk due to Interaction.

Supplementary Table S7. Interaction between obesity and smoking status for unacceptable levels of pain.

	Non-smoker	Ever smoker	Effect of smoking ever within the strata of obese
Non-obese	1.0 (reference)	2.4 (1.4 to 4.1) p=0.002	2.4 (1.4 to 4.1) p=0.002
Obese	7.2 (2.8 to 18.3) p<0.001	2.9 (1.3 to 6.7) p=0.011	0.4 (0.1 to 1.3) p=0.115
Effect of obese within the strata of smoking ever	7.2 (2.8 to 18.3) p<0.001	1.2 (0.5 to 2.8) p=0.626	
Effect modification on multiplicative scale (95% CI): 0.2 (0.1 to 0.6) p=0.006			
Effect modification on additive scale (RERI; 95% CI): -5.6 (-17.1 to 0.4) p=0.942			

Data are presented as individual and joint odds ratios (95% confidence interval), with non-smoker and non-obese as the reference. Measures of additive and multiplicative effect modification are provided.

RERI: Relative Excess Risk due to Interaction.

Supplementary Table S8. Interaction between obesity and smoking status for unacceptable overall SLE-related health state.

	Non-smoker	Ever smoker	Effect of smoking ever within the strata of obese
Non-obese	1.0 (reference)	1.6 (0.9 to 2.9) p=0.100	1.6 (0.9 to 2.9) p=0.100
Obese	3.2 (1.3 to 7.8) p=0.012	2.0 (0.8 to 4.7) p=0.123	0.6 (0.2 to 1.9) p=0.409
Effect of obese within the strata of smoking ever	3.2 (1.3 to 7.8) p=0.012	1.2 (0.5 to 2.9) p=0.671	
Effect modification on multiplicative scale (95% CI): 0.4 (0.1 to 1.3) p=0.133			
Effect modification on additive scale (RERI; 95% CI): -1.8 (-5.0 to 1.4) p=0.864			

Data are presented as individual and joint odds ratios (95% confidence interval), with non-smoker and non-obese as the reference. Measures of additive and multiplicative effect modification are provided.

RERI: Relative Excess Risk due to Interaction.