

Supplementary Table 1: Pairwise comparison between depression and disease activity on quality of life in IBD patients (Mann-Whitney U test). The comparison is based on the four disease activity and depression categories (remission - no depression, remission - depression, active disease – no depression, active disease – depression) displayed in Figure 1. In total, there are six combinations of pairwise comparison out of four categories.

A. Crohn’s disease

Comparison #	Disease Activity and Depression Status	SIBDQ Mean	# of Patients	Disease Activity and Depression Status	SIBDQ Mean
Comparison 1	Remission with no depression	54.5	34	Active disease with no depression	50.4
Comparison 2	Remission with depression	44.7	10	Active disease with depression	39.0
Comparison 3	Active disease with no depression	50.4	5	Active disease with depression	39.0
Comparison 4	Remission with no depression	54.5	34	Remission with depression	44.7
Comparison 5	All non-depression patients	53.9	44	All depression patients	42.6
Comparison 6	All remission patients	52.2	39	All active disease patients	44.2

B. Ulcerative Colitis

Comparison #	Disease Activity and Depression Status	SIBDQ Mean	# of Patients	Disease Activity and Depression Status	SIBDQ Mean
Comparison 1	Remission with no depression	58.9	13	Active disease with no depression	47.1
Comparison 2	Remission with depression	40.3	3	Active disease with depression	36.6
Comparison 3	Active disease with no depression	47.1	27	Active disease with depression	36.6
Comparison 4	Remission with no depression	58.9	13	Remission with depression	40.3
Comparison 5	All non-depression patients	50.9	40	All depression patients	37.7
Comparison 6	All remission patients	55.4	16	All active disease patients	44.9

Supplementary Table 2: Regression analysis of the relationship between SIBDQ subphenotypes and BDI-II.

A. Crohn's disease

Subphenotype	β Coefficient	P value
Bowel	-0.298	1.68×10^{-5}
Systemic	-0.202	9.95×10^{-5}
Social	-0.164	0.000507
Emotional	-0.144	0.00108
All (SIBDQ)	-0.808	2.10×10^{-8}

B. Ulcerative Colitis

Subphenotype	β Coefficient	P value
Bowel	-0.232	0.00134
Systemic	-0.240	1.82×10^{-7}
Social	-0.171	0.00152
Emotional	-0.139	9.93×10^{-4}
All (SIBDQ)	-0.782	2.93×10^{-6}

Supplementary Table 3: Power calculation for various combinations of sample sizes and effect size measured in adjusted R-squares. The adjusted R-squares were calculated from simple regression with one predictor variable such as BDI, disease activity (CDAI in CD and SAI in UC), Narcotic use, etc. The predictor variables showing statistical significance were displayed in Table 3. The 0.01 type I error is used in power calculation. Sample sizes range from 50, 40, 15 which correspond to current CD or UC samples, CD remission or UC active samples, and CD active or UC remission samples. Additionally, the power for sample size 100 is listed.

Adjusted R-squares	Power			
	50 samples (CD or UC all)	40 samples (CD remission or UC active)	15 samples (CD active or UC remission)	100 samples
0.02	0.113	0.097	0.0545	0.173
0.04	0.186	0.152	0.0687	0.362
0.08	0.358	0.283	0.102	0.675
0.12	0.533	0.428	0.141	0.869
0.16	0.688	0.569	0.186	0.957
0.20	0.808	0.694	0.238	0.989
0.30	0.961	0.903	0.389	1.000
0.40	0.996	0.981	0.560	1.000