

Appendix

Tables S5-S10: Univariate analyses of constipation and constipation-related symptoms are adjusted to sex, age, BMI, eGFR tercile, and comorbidities. Selection of multiple regression model is described in the Methods section in the manuscript. ^a represents presence of the symptom, regardless of its severity.

Table S1. Internal consistency reliability and construct validity of SF-36v2 subscales

SF-36v2 subscale	Internal consistency reliability		Construct validity	
	Cronbach's alpha	Average inter-item correlation	Convergent validity ^a	Discriminant validity ^b
PF	0.934	0.587	0.65-0.80	0.32-0.68
RP	0.944	0.810	0.82-0.92	0.42-0.77
BP	0.916	0.846	0.87	0.41-0.66
GH	0.646	0.267	0.34-0.51	0.23-0.54
VT	0.834	0.557	0.61-0.71	0.40-0.65
SF	0.818	0.691	0.69	0.49-0.61
RE	0.962	0.893	0.92-0.93	0.42-0.72
MH	0.846	0.523	0.62-0.72	0.26-0.71

^a Item-own scale correlation; poor convergent validity is indicated when items do not correlate .40 or higher with their hypothesized scale score. ^b Item-other scale correlation; poor discriminant validity is indicated when items correlate significantly higher with competing scales than with their hypothesized scale.

We found that nearly all subscales were reliable (Cronbach's alpha above 0.80), but General Health (GH) subscale was not. Average inter-item correlations exceeding 0.5 for the all rest of subscales proved reliability and suggested redundant character of some questions in the subscales. Moreover, convergent validity of the Polish version of SF-36v2 subscales, besides GH, was confirmed as all the correlation coefficients of items within these subscales exceeded the 0.40 criterion. Similarly, 4 out of 5 items in GH subscale and 1 item out of 5 items in MH subscale (MH05: happiness) failed their discriminant validity as their correlation coefficients with other scales were higher than correlation coefficients with their own subscales.

Abbreviations: BP, bodily pain; GH, general health perceptions; MH, general mental health; PF, physical functioning; RE, role limitations due to emotional problems; RP, role limitations due to physical health problems; SF, social functioning; VT, vitality.

Table S2. Pharmacological treatment of the study population.

	All	Patients defecating less than once a day	Patients meeting criteria of functional constipation	Patients meeting Bristol scale criteria of constipation
N	111	38	21	28
No data, n		5	0	14
Beta blockers, n (%)	75 (67.6)	25 (65.8)	14 (66.7)	19 (67.9)
Calcium channel blockers, n (%)	58 (52.3)	26 (68.4)	11 (52.4)	16 (57.1)
Diuretics, n (%)	60 (54.1)	23 (60.5)	9 (42.9)	21 (75.0)
NSAIDs, n (%)	24 (21.6)	7 (18.4)	2 (9.5)	4 (14.3)
Paracetamol, n (%)	14 (12.6)	8 (21.1)	5 (23.8)	4 (14.3)
Calcium supplements, n (%)	21 (18.9)	6 (15.8)	3 (14.3)	6 (21.4)
Vitamin D, n (%)	34 (30.6)	15 (39.5)	11 (52.4)	8 (28.6)
Iron, n (%)	8 (7.2)	2 (5.3)	1 (4.8)	3 (10.7)
Hypnotics, n (%)	7 (6.3)	1 (2.6)	2 (9.5)	1 (3.6)

Abbreviations: NSAIDs, nonsteroidal anti-inflammatory drugs.

Table S3. Poisson regression model showing variables significantly and independently associated with altered prevalence ratio of presence of at least 2 criteria of functional constipation.

Variable	Univariate analyses (row represents separate model)		Multiple regression	
	PR (95% CI)	<i>P</i> value	PR (95% CI)	<i>P</i> value
Use of vitamin D	2.30 (1.06, 5.00)	0.035	1.59 (0.76, 3.31)	0.214
Use of paracetamol	2.26 (0.97, 5.25)	0.058	2.67 (1.07, 6.64)	0.035
Use of NSAIDs	0.39 (0.10, 1.58)	0.188	0.34 (0.11, 1.00)	0.049
Age	1.02 (0.99, 1.04)	0.273	1.03 (0.99, 1.06)	0.152
Female sex	1.61 (0.72, 3.57)	0.239	2.10 (0.85, 5.23)	0.109
BMI	0.97 (0.91, 1.04)	0.369	1.02 (0.95, 1.08)	0.617
eGFR tercile:				
- High	reference	-	reference	-
- Medium	1.40 (0.41, 4.78)	0.590	0.79 (0.24, 2.61)	0.699
- Low	2.61 (0.91, 7.47)	0.074	2.85 (1.12, 7.28)	0.028
Diabetes	0.55 (0.20, 1.52)	0.252	0.37 (0.11, 1.23)	0.105
Heart failure	0.70 (0.22, 2.17)	0.534	0.67 (0.23, 2.00)	0.477
Hypothyroidism	1.35 (0.51, 3.55)	0.540	1.33 (0.55, 3.21)	0.522
Depression	2.31 (0.73, 7.32)	0.154	1.95 (0.74, 5.14)	0.177

Abbreviations: BMI, body mass index; eGFR, estimated glomerular filtration rate; NSAIDs, nonsteroidal anti-inflammatory drugs.

Table S4. Poisson regression model showing variables significantly and independently associated with altered prevalence ratio of having less than 7 bowel movements per week.

Variable	Univariate analyses (row represents separate model)		Multiple regression	
	PR (95% CI)	<i>P</i> value	PR (95% CI)	<i>P</i> value
Use of vitamin D	1.50 (0.89, 2.53)	0.129	1.38 (0.72, 2.65)	0.337
Use of paracetamol	1.84 (1.06, 3.18)	0.030	1.53 (0.72, 3.27)	0.271
Use of calcium channel blocker	2.00 (1.12, 3.56)	0.018	1.72 (0.98, 3.00)	0.059
Age	0.99 (0.98, 1.01)	0.417	0.99 (0.97, 1.01)	0.288
Female sex	1.70 (1.00, 2.90)	0.049	1.86 (0.96, 3.61)	0.066
BMI	0.98 (0.93, 1.04)	0.527	1.01 (0.95, 1.07)	0.845
eGFR tercile:				
- High	Reference	-	Reference	-
- Medium	1.50 (0.73, 3.09)	0.271	1.42 (0.70, 2.87)	0.334
- Low	1.67 (0.84, 3.31)	0.144	1.79 (0.87, 3.67)	0.114
Diabetes	0.87 (0.48, 1.57)	0.636	0.79 (0.40, 1.54)	0.484
Heart failure	0.75 (0.36, 1.56)	0.436	0.80 (0.37, 1.70)	0.559
Hypothyroidism	1.02 (0.51, 2.07)	0.949	0.80 (0.36, 1.76)	0.578
Depression	1.16 (0.38, 3.53)	0.787	0.68 (0.21, 2.20)	0.521

Abbreviations: BMI, body mass index; eGFR, estimated glomerular filtration rate.

Table S5. Adjusted physical functioning (PF) score regressions and selected multiple regression.

Variable	Adjusted univariate analyses (row represents separate model)			Selected multiple regression (AIC 903.0, R ² = 0.530, P < 0.001)	
	Coefficient	P value	AIC	Coefficient (95% CI)	P value
Frequency of defecation: :			926.5		
- Once a day	reference	-		reference	-
- Less than once a day	-19.30	<0.001		-8.72 (-19.56, 2.12)	0.113
- More than once a day	-0.887	0.880		3.83 (-7.12, 14.79)	0.489
Discomfort in abdomen ^a	-13.70	0.006	970.6	-	-
Discomfort in abdomen:			972.3		
- Lack	reference	-		-	-
- Mild	-11.97	0.048			
- Medium/severe	-15.88	0.017			
Pain in abdomen ^a	-24.48	0.001	953.0	-19.28 (-29.51, -9.04)	<0.001
Pain in abdomen:			954.1		
- Lack	reference	-		-	-
- Mild	-26.76	<0.001			
- Medium/severe	-19.64	0.009			
BM that was too small ^a	-18.89	0.001	966.4	-11.08 (-21.88, -0.28)	0.044
BM that was too small:			964.7		
- Lack	reference	-		-	-
- Mild	-11.00	0.116			
- Medium/severe	-28.08	<0.001			
Stomach cramps ^a	-16.58	0.002	968.6	-	-
Stomach cramps:			970.1		
- Lack	reference	-		-	-
- Mild	-18.75	0.003			
- Medium/severe	-11.50	0.216			

Table S6. Adjusted role limitations due to physical health problems (RP) score regressions and selected multiple regression.

Variable	Adjusted univariate analyses (row represents separate model)			Selected multiple regression (AIC = 945.0, R ² = 0.398, P < 0.001)	
	Coefficient	P value	AIC	Coefficient (95% CI)	P value
Frequency of defecation: :			963.0		
- Once a day	reference	-		Reference	-
- Less than once a day	-20.52	<0.001		-11.64 (-23.82, 0.54)	0.061
- More than once a day	-4.84	0.470		-1.71 (-14.53, 11.11)	0.792
Functional constipation	-19.35	0.006	1014.5	-	-
Discomfort in abdomen ^a	-15.63	0.005	1004.7	-	-
Discomfort in abdomen:			1005.5		
- Lack	reference	-		-	-
- Mild	-11.59	0.087			
- Medium/severe	-20.29	0.005			
Pain in abdomen ^a	-22.91	<0.001	996.4	-16.72 (-28.80, -4.64)	0.007
Pain in abdomen:			998.4		
- Lack	reference	-		-	-
- Mild	-22.46	<0.001			
- Medium/severe	-23.87	0.007			
BM that was too hard ^a	-14.41	0.009	1005.8	-	-
BM that was too hard			1005.0		
- Lack	reference	-		-	-
- Mild	-8.46	0.197			
- Medium/severe	-21.73	0.003			
BM that was too small:			1006.76		
- Lack	reference	-		-	-
- Mild	-5.17	0.510			
- Medium/severe	-24.58	0.005			

Stomach cramps ^a	-19.23	0.002	1002.6	-	-
Stomach cramps:			1004.3		
- Lack	reference	-			-
- Mild	-21.17	0.003		-	
- Medium/severe	-14.71	0.159			
Straining/squeezing ^a	-16.76	0.002	1002.6	-9.358 (-19.86, 1.14)	0.080
Straining/squeezing:			1004.6	-	-
- Lack	Reference	-			
- Mild	-17.54	0.006			
- Medium/severe	-15.76	0.024			

Table S7. Adjusted bodily pain (BP) score regressions and selected multiple regression.

Variable	Adjusted univariate analyses (row represents separate model)			Selected multiple regression model (AIC 987.6, R ² = 0.366, P < 0.001)	
	Coefficient	P value	AIC	Coefficient (95% CI)	P value
Functional constipation	-16.17	0.020	1010.6	-	-
Bloating in abdomen ^a	-13.01	0.012	1000.2	-	-
Bloating in abdomen:			998.3		
- Lack	reference	-		-	-
- Mild	-7.71	0.185			
- Medium/severe	-21.31	0.002			
Pain in abdomen ^a	-19.75	<0.001	994.0	-16.03 (-27.11, -4.95)	0.005
Pain in abdomen:			995.8		
- Lack	reference	-		-	-
- Mild	-18.50	0.005			
- Medium/severe	-22.42	0.010			
BM that was too hard ^a	-14.07	0.008	999.4	-13.11 (-23.08, -3.14)	0.010
BM that was too hard			999.2		
- Lack	reference	-		-	-
- Mild	-8.95	0.160			
- Medium/severe	-20.37	0.004			
Discomfort in abdomen ^a	-14.31	0.008	999.4	-	-
Discomfort in abdomen:			998.6		
- Lack	reference	-		-	-
- Mild	-8.26	0.205			
- Medium/severe	-21.28	0.002			
Feeling false alarm:			1000.3		
- Lack	Reference	-		Reference	-
- Mild	-6.47	0.408		1.56 (-13.50, 16.62)	0.838
- Medium/severe	-29.45	0.006		-20.85 (-41.07, -0.64)	0.043

Table S8. Adjusted vitality (VT) score regressions and selected multiple regression.

Variable	Adjusted univariate analyses (each row represents separate model)			Selected adjusted regression (AIC 909.1, R ² = 0.373, P < 0.001)	
	Coefficient	P value	AIC	Coefficient (95% CI)	P value
Discomfort in abdomen ^a	-13.62	<0.001	920.6	-10.78 (-18.24, -3.32)	0.005
Discomfort in abdomen:			920.1		
- Lack	reference	-		-	-
- Mild	-9.63	0.042			
- Medium/severe	-18.21	<0.001			
BM that was too hard			921.8		
- Lack	reference	-		reference	-
- Mild	4.69	0.314		7.34 (-1.36, 16.04)	0.097
- Medium/severe	-15.61	0.002		-12.66 (-22.06, -3.27)	0.009
Painful BM ^a	-12.98	0.022	928.0	-10.26 (-20.59, 0.06)	0.051
Bloating in abdomen ^a	-9.33	0.015	927.3	-	-
Bloating in abdomen:			927.0		
- Lack	reference	-		-	-
- Mild	-6.29	0.148			
- Medium/severe	-14.11	0.006			
Pain in abdomen ^a	-15.15	<0.001	919.5	-	-
Pain in abdomen:			921.5		
- Lack	reference	-		-	-
- Mild	-14.66	0.002			
- Medium/severe	-16.19	0.012			
Functional constipation	-10.25	0.048	938.6	-	-
Stomach cramps ^a	-11.98	0.007	925.7	-	-
Stomach cramps:			927.7		
- Lack	reference	-		-	-
- Mild	-11.56	0.026			
- Medium/severe	-12.95	0.090			

Feeling false alarm ^a	-12.49	0.010	926.6	-	-
Feeling false alarm:			926.8		
- Lack	reference	-		-	-
- Mild	-8.46	0.145			
- Medium/severe	-20.18	0.011			

Table S9. Adjusted social functioning (SF) score regressions and selected multiple regression

Variable	Adjusted univariate analyses (row represents separate model)			Selected adjusted multiple regression (AIC 982.0, R ² = 0.337, P < 0.001)	
	Coefficient	P value	AIC	Coefficient (95% CI)	P value
Discomfort in abdomen ^a	-16.61	0.001	986.6	-	-
Discomfort in abdomen:			987.0		
- Lack	reference	-		Reference	-
- Mild	-12.36	0.046		-5.16 (-18.31, 8.00)	0.438
- Medium/severe	-21.50	0.001		-21.32 (-37.84, -4.80)	0.012
Pain in abdomen ^a	-18.84	0.001	985.1	-	-
Pain in abdomen:			985.3		
- Lack	reference	-		Reference	-
- Mild	-22.51	0.000		-16.44 (-29.95, -2.92)	0.018
- Medium/severe	-11.04	0.178		6.08 (-14.57, 26.73)	0.560
Painful BM ^a	-17.61	0.016	991.8	-	-
Straining/squeezing ^a	-12.21	0.016	991.7	-	-

Table S10. Adjusted role limitations due to emotional problems (RE) score regressions and selected multiple regression.

Variable	Adjusted univariate analyses (row represents separate model)			Selected adjusted regression (AIC 983.5, R ² = 0.359, P < 0.001)	
	Coefficient	P value	AIC	Coefficient (95% CI)	P value
Discomfort in abdomen ^a	-16.99	0.001	987.0	-12.29 (-22.67, -1.90)	0.021
Discomfort in abdomen:			988.5		
- Lack	reference	-		-	-
- Mild	-14.60	0.020			
- Medium/severe	-19.74	0.003			
Painful BM ^a	-19.49	0.008	991.2	-13.22 (-27.37, 0.94)	0.067
BM that was too small ^a	-15.41	0.009	991.5	-9.11 (-20.75, 2.52)	0.123
Straining/squeezing ^a	-14.12	0.005	990.3	-	-
Straining/squeezing:			992.3		
- Lack	Reference	-		-	-
- Mild	-14.47	0.016			
- Medium/severe	-13.67	0.037			