

Supplementary information

S1. The seven included items from the original Short Health Anxiety Inventory

Each question in this section consists of a group of four statements. Please read each group of statements carefully and then select the one which best describes your feelings, over the past six months. Identify the statement by ringing the letter next to it, i.e. if you think that statement (a) is correct, ring statement (a); it may be that more than one statement applies, in which case, please ring any that are applicable.

1. (a) I do not worry about my health
(b) I occasionally worry about my health
(c) I spend much of my time worrying about my health
(d) I spend most of my time worrying about my health

3. (a) As a rule I am not aware of bodily sensation or changes
(b) Sometimes I am aware of bodily sensation or changes
(c) I am often aware of bodily sensations or changes
(d) I am constantly aware of bodily sensations or changes

8. (a) I am lastingly relieved if my doctor tells me nothing is wrong
(b) I am initially relieved but the worries sometimes return later
(c) I am initially relieved but the worries always return later
(d) I am not relived if my doctor tells me there is nothing wrong

9. (a) If I hear about an illness I never think I have it myself
(b) If I hear about an illness I sometimes think I have it myself
(c) If I hear about an illness I often think I have it myself
(d) If I hear about an illness I always think I have it myself

10. (a) If I have a bodily sensation or change I rarely wonder what it means
(b) If I have a bodily sensation or change I often wonder what it means
(c) If I have a bodily sensation or change I always wonder what it means
(d) If I have a bodily sensation or change I must know what it means

11. (a) I usually feel at very low risk for developing an illness
(b) I usually feel at fairly low risk for developing an illness
(c) I usually feel at moderate risk for developing an illness
(d) I usually feel at high risk for developing an illness

For the following question, please think about what it might be like if you had a serious illness of a type which particular concerns (such as heart disease, cancer, multiple sclerosis and so on). Obviously you cannot know for definite what it would be like; please give your best estimate of what you think might happen, basing your estimate on what you know about yourself and serious illness in general.

15. (a) If I had a serious illness I would still be able to enjoy things in my life quite a lot.
(b) If I had a serious illness I would still be able to enjoy things in my life a little
(c) If I had a serious illness I would be almost completely unable to enjoy things in my life
(d) If I had a serious illness I would be completely unable to enjoy life at all

S2. Table 1. Study group characteristics

	Women				Men				p-value ⁶
	n	range	mean	SD	n	range	mean	SD	
Age	203	18-86	49.7	16.5	108	19-83	53.4	16.6	0.04
BMI	200	17.5-57.4	26.2	6.1	108	17.9-36.1	26.9	3.6	0.003
SRH ¹	198	1-5	2.3	1.0	103	1-5	2.5	1.0	0.19
SicknessQ4 ²	187	0-3	1.0	0.7	94	0-2.3	0.9	0.6	0.24
SicknessQ10 ²	119	1-30	11.1	7.1	51	0-23	9.3	6.2	0.05
Health anxiety ³	169	1-3.3	1.9	0.4	90	1-3.3	1.8	0.5	0.04
IL-6 (pg/ml) ⁴	199	0.2-46.4	3.0	6.2	102	0.19-396	7.6	39.4	0.04
IL-8 (pg/ml) ⁴	199	1-256	5.9	18.3	102	1.85-14.2	4.9	2.6	0.05
TNF α (pg/ml) ⁴	199	0.5-17.1	2.0	1.7	102	0.7-7.4	2.2	1.1	0.03
F _E NO (ppb) ⁵	203	0-7.4	0.9	0.9	108	0-4.3	0.7	0.6	0.11

¹Higher scores denote poor self-rated health

²Higher scores denote more pronounced sickness behaviour

³Higher scores denote more pronounced health anxiety

⁴Crude values.

⁵F_ENO -values are reported as percent expected, i.e. mean value from two successive measurements divided by predicted normal F_ENO values in non-atopic adult subjects adjusted for height and age.

⁶Mann-Whitney U test

Abbreviations: BMI - body mass index, SicknessQ - sickness questionnaire (10 items), SicknessQ4 - Sickness questionnaire (4 items), IL-6 – interleukin 6, IL-8 – interleukin 8, TNF α – tumour necrosis factor alpha, F_ENO – exhaled fraction of nitric oxide

S3 Table 2. Partial correlations between sickness behaviour, F_ENO, cytokines and self-rated health (adjusted for age, BMI)

SRH	Women			Men		
	n	partial ρ	p	n	partial ρ	p
SicknessQ	112	0.21	0.027	49	0.42	0.003
SicknessQ4	184	0.28	<0.001	93	0.46	<0.001
IL-6 (pg/ml)	193	-0.15	0.036	99	0.26	0.009
IL-8 (pg/ml)	193	-0.06	0.414	99	-0.10	0.317
TNF α (pg/ml)	193	-0.19	0.008	99	0.01	0.912
F _E NO (ppb)	196	-0.22	0.002	103	-0.02	0.860
health anxiety	167	0.31	<0.001	89	0.32	0.003

Higher scores on self-rated health denote poor self-rated health. Higher scores on SicknessQ and SicknessQ4 and denote more pronounced sickness behaviour.

Abbreviations: SicknessQ - sickness questionnaire (10 items), SicknessQ4 - Sickness questionnaire (4 items), IL-6 – interleukin 6, IL-8 – interleukin 8, TNF α – tumour necrosis factor alpha, F_ENO – exhaled fraction of nitric oxide

S4. Table 3. Partial correlations between F_ENO, cytokines and sickness behaviour (adjusted for age and BMI)

SicknessQ	Women			Men		
	n	partial ρ	p value	n	partial ρ	p value
IL-6 (pg/ml)	111	0.190	0.049	47	0.34	0.023
IL-8 (pg/ml)	111	0.16	0.10	47	0.003	0.98
TNF α (pg/ml)	111	-0.01	0.89	47	0.26	0.09
F _E NO (ppb)	113	-0.09	0.33	49	-0.08	0.61
SicknessQ4	Women			Men		
	n	partial ρ	p value	n	partial ρ	p value
IL-6 (pg/ml)	182	0.08	0.28	91	0.29	0.005
IL-8 (pg/ml)	182	0.10	0.17	91	0.03	0.77
TNF α (pg/ml)	182	-0.003	0.97	91	0.17	0.12
F _E NO (ppb)	185	-0.09	0.26	94	0.01	0.90

Higher scores on self-rated health denote poor self-rated health. Higher scores on SicknessQ and SicknessQ4 denote higher degree of sickness behaviour.

Abbreviations: SicknessQ - sickness questionnaire (10 items), SicknessQ4 - Sickness questionnaire (4 items), IL-6 – interleukin 6, IL-8 – interleukin 8, TNF α – tumour necrosis factor alpha, F_ENO – exhaled fraction of nitric oxide

S5. Table 4. Spearman correlations between self-rated health, sickness behaviour, cytokines, F_ENO and health anxiety (adjusted for age, BMI)

Health anxiety	Women			Men		
	n	partial ρ	p	n	partial ρ	p
SicknessQ	108	0.04	0.65	47	0.32	0.031
SicknessQ4	160	0.10	0.21	84	0.44	<0.001
IL-6 (pg/ml)	165	-0.27	<0.001	87	-0.01	0.93
IL-8 (pg/ml)	165	-0.02	0.79	87	-0.09	0.43
TNF α (pg/ml)	165	-0.08	0.30	87	0.02	0.83
F _E NO (ppb)	168	-0.15	0.06	90	-0.10	0.38

Higher scores on self-rated health denote worse self-rated health. Higher scores on SQ and SQ4 and denote more pronounced sickness behaviour.

Abbreviations: SicknessQ - sickness questionnaire (10 items), SicknessQ4 - Sickness questionnaire (4 items), IL-6 – interleukin 6, IL-8 – interleukin 8, TNF α – tumor necrosis factor alpha, F_ENO – exhaled fraction of nitric oxide

S6. Table 5. Partial correlations between sickness behaviour, F_ENO, cytokines and self-rated health (adjusted for age, BMI and health anxiety)

SRH	Women			Men		
	n	partial ρ	p value	n	partial ρ	p value
SicknessQ	108	0.22	0.025	47	0.36	0.015
SicknessQ4	160	0.24	0.002	83	0.42	<0.001
IL-6 (pg/ml)	164	-0.08	0.31	86	0.29	0.008
IL-8 (pg/ml)	164	-0.03	0.72	86	-0.10	0.37
TNF α (pg/ml)	164	-0.10	0.19	86	-0.05	0.67
F _E NO (ppb)	167	-0.14	0.07	89	-0.02	0.84

Higher scores on self-rated health denote poor self-rated health. Higher scores on SicknessQ and SicknessQ4 denote higher degree of sickness behaviour.

Abbreviations: SicknessQ - sickness questionnaire (10 items), SicknessQ4 - Sickness questionnaire (4 items), IL-6 – interleukin 6, IL-8 – interleukin 8, TNF α – tumour necrosis factor alpha, F_ENO – exhaled fraction of nitric oxide

S7. Table 6. Partial correlations between F_ENO, cytokines and sickness behaviour (adjusted for age, BMI and health anxiety)

SicknessQ	Women			Men		
	n	partial ρ	p value	n	partial ρ	p value
IL-6 (pg/ml)	106	0.22	0.026**	45	0.39	0.010**
IL-8 (pg/ml)	106	0.18	0.070	45	0.05	0.753
TNF α (pg/ml)	106	0.01	0.966	45	0.29	0.064
F _E NO (ppb)	108	-0.11	0.279	47	-0.10	0.500
SicknessQ4	Women			Men		
	n	partial ρ	p value	n	partial ρ	p value
IL-6 (pg/ml)	157	0.15	0.055	81	0.31	0.006**
IL-8 (pg/ml)	157	0.14	0.075	81	0.05	0.633
TNF α (pg/ml)	157	0.09	0.261	81	0.13	0.242
F _E NO (ppb)	160	-0.10	0.228	84	0.04	0.750

Higher scores on self-rated health denote poor self-rated health. Higher scores on SQ and SQ4 denote higher degree of sickness behaviour.

Abbreviations: SicknessQ - sickness questionnaire (10 items), SicknessQ4 - Sickness questionnaire (4 items), IL-6 – interleukin 6, IL-8 – interleukin 8, TNF α – tumour necrosis factor alpha, F_ENO – exhaled fraction of nitric oxide