

Table S1. Individual item difficulty (location with its SE) and tests of fit (residuals and chi-square and its probability) for abbreviated World Health Organization Quality of Life (WHOQOL-Bref) questionnaire

Item	Location	SE	Fit Residual	Chi-Square	Probability
Physical ^a					
- Item 3	-0.360	0.161	2.703	11.127	0.004
- Item 4	-0.226	0.176	0.672	0.051	0.975
- Item 10	0.809	0.162	0.873	3.777	0.151
- Item 15	-0.486	0.170	0.594	0.172	0.918
- Item 16	-0.778	0.158	0.346	7.166	0.028
- Item 17	0.538	0.163	-1.108	4.825	0.090
- Item 18	0.502	0.167	-1.728	6.367	0.041
Psychological ^b					
- Item 5	0.485	0.177	-0.379	2.432	0.296
- Item 6	0.501	0.216	-0.742	5.464	0.065
- Item 7	0.435	0.171	1.937	6.856	0.032
- Item 11	-0.123	0.147	1.498	0.257	0.880
- Item 19	-0.345	0.155	0.094	0.205	0.903
- Item 26	-0.953	0.172	-0.224	1.369	0.504
Social Relationship ^c					
- Item 20	0.323	0.189	-0.580	0.720	0.698
- Item 21	-0.968	0.242	-0.307	4.012	0.135
- Item 22	0.646	0.170	0.693	1.901	0.387
Environment ^d					
- Item 8	-0.815	0.189	0.774	0.401	0.818
- Item 9	0.451	0.164	1.542	9.621	0.008
- Item 12	0.341	0.143	-0.531	0.126	0.939
- Item 13	-0.055	0.150	-0.420	4.193	0.123
- Item 14	0.322	0.144	0.022	0.357	0.837
- Item 23	-0.378	0.171	-0.651	3.290	0.193
- Item 24	0.048	0.153	0.100	1.292	0.524
- Item 25	0.086	0.145	0.238	0.262	0.877

SE Standard error

Probability significance tested after Bonferroni adjustment at ^ap <0.007, ^bp <0.008, ^cp <0.017 and ^dp <0.006

Table S2. Analysis of variance of standardized residuals of sets of questionnaire items and their response categories, for both the native and the rescored WHOQOL-Bref scales. Probability values are based on F ratios for each item within three separate analyses based on age, gender and asthma control respectively, and were tested after Bonferroni correction.

	Native instrument						Rescored instrument					
	Age		Gender		Control		Age		Gender		Control	
	F	P value	F	P value	F	P value	F	P value	F	P value	F	P value
Physical ^a												
- Item 3	0.545	0.583	0.395	0.532	3.740	0.030						
- Item 4	1.112	0.336	0.000	0.985	1.048	0.357	1.181	0.314	0.004	0.950	0.466	0.630
- Item 10	0.079	0.924	1.495	0.226	0.363	0.697	0.317	0.729	1.921	0.171	1.719	0.188
- Item 15	0.544	0.583	1.240	0.270	0.186	0.830	0.670	0.515	1.740	0.192	0.357	0.701
- Item 16	2.212	0.119	0.443	0.508	1.107	0.337	2.131	0.128	0.164	0.687	0.624	0.539
- Item 17	0.159	0.853	5.150	0.027	0.358	0.700	0.052	0.949	4.399	0.040	0.089	0.915
- Item 18	2.088	0.133	0.671	0.416	3.494	0.037	2.258	0.114	0.401	0.529	2.395	0.100
Psychological ^b												
- Item 5	0.401	0.671	4.502	0.038	0.179	0.837	0.297	0.745	3.894	0.053	0.133	0.875
- Item 6	0.718	0.492	0.002	0.966	1.177	0.315	0.636	0.533	0.019	0.890	0.944	0.395
- Item 7	1.809	0.173	0.703	0.405	0.800	0.454	2.167	0.124	1.104	0.298	0.804	0.453
- Item 11	0.075	0.928	0.009	0.926	0.331	0.720	0.447	0.642	0.087	0.769	0.058	0.944
- Item 19	1.158	0.321	0.195	0.661	1.421	0.250	1.527	0.226	0.404	0.527	1.669	0.197
- Item 26	1.882	0.162	0.045	0.832	1.914	0.157	1.681	0.195	0.001	0.979	1.368	0.263
Social Relationship ^c												
- Item 20	0.132	0.876	1.493	0.228	2.001	0.147	0.124	0.884	1.255	0.268	2.538	0.091
- Item 21	5.020	0.011	1.043	0.312	0.567	0.571	5.380	0.008	1.143	0.290	0.694	0.505
- Item 22	1.737	0.186	2.419	0.126	1.595	0.213	1.936	0.155	2.218	0.142	1.639	0.204
Environment ^d												
- Item 8	0.688	0.507	0.688	0.507	1.541	0.223	0.761	0.472	0.132	0.717	1.996	0.145
- Item 9	0.622	0.541	0.622	0.541	0.511	0.603	1.152	0.323	1.106	0.297	0.732	0.485
- Item 12	0.558	0.575	0.558	0.575	0.271	0.764	0.524	0.595	0.296	0.588	0.263	0.770
- Item 13	0.123	0.884	0.123	0.884	0.385	0.682	0.363	0.697	0.096	0.758	0.215	0.807
- Item 14	3.143	0.051	3.143	0.051	2.139	0.127	4.186	0.020	0.515	0.476	1.590	0.213
- Item 23	3.697	0.031	3.697	0.031	1.754	0.182	3.525	0.036	0.000	0.998	1.107	0.337
- Item 24	0.025	0.975	0.025	0.975	2.506	0.090	0.022	0.978	1.357	0.249	2.149	0.126
- Item 25	1.467	0.239	1.467	0.239	0.408	0.667	0.835	0.439	1.608	0.210	0.171	0.843

Probability significance tested at ^ap <0.004, ^bp <0.004, ^cp <0.008 and ^dp <0.003

Table S3. Item threshold parameters for different domains

Questionnaire items and domains	Threshold (in logits) between response categories in the native instrument				Response rescoring pattern*	Threshold (in logits) between response categories in rescored instrument			
	1 and 2	2 and 3	3 and 4	4 and 5		1 and 2	2 and 3	3 and 4	4 and 5
Physical									
- Item 3	-5.703	0.037	1.645	2.580	Deleted				
- Item 4	-6.020	0.020	1.374	3.723	11234	-1.805	-0.345	2.150	
- Item 10	-2.444	0.464	2.563	2.655	12344	-2.732	0.362	2.370	
- Item 15	-5.629	-0.628	1.689	2.625	11234	-2.084	0.380	1.705	
- Item 16	-5.414	-0.188	0.523	1.968	11234	-1.093	-0.309	1.402	
- Item 17	-2.140	-0.149	1.342	3.100	12345	-2.960	-0.774	0.847	2.887
- Item 18	-1.977	-0.439	1.204	3.219	12345	-2.768	-1.043	0.747	3.064
Psychological									
- Item 5	-2.060	-0.970	1.510	3.461	12345	-2.665	-1.541	1.042	3.163
- Item 6	-7.970	-1.216	1.504	9.687	11233	-1.427	1.427		
- Item 7	-3.012	-0.079	1.249	3.581	12345	-3.708	-0.415	0.834	3.289
- Item 11	-2.377	-0.612	1.247	1.249	12344	-1.800	0.221	1.578	
- Item 19	-1.948	-1.570	0.763	1.375	12345	-1.665	-1.247	1.145	1.767
- Item 26	-7.332	0.329	-1.102	4.293	11123	-2.547	2.547		
Social Relationship									
- Item 20	0.232	-2.876	0.617	3.317	11234	-2.850	0.072	2.778	
- Item 21	-4.748	-2.986	0.852	3.009	11234	-3.356	0.610	2.746	
- Item 22	-1.376	-0.583	1.109	3.432	12345	-1.863	-1.308	0.425	2.746
Environment									
- Item 8	-6.292	-1.288	1.011	3.307	11234	-2.391	-0.019	2.410	
- Item 9	-0.801	-1.642	1.197	3.050	11234	-2.316	0.293	2.023	
- Item 12	-0.716	-1.244	2.556	0.768	11233	-1.406	1.406		
- Item 13	-3.107	-0.179	1.482	1.582	12344	-2.864	0.795	2.068	
- Item 14	-0.765	-1.210	1.615	1.640	11233	-1.112	1.112		
- Item 23	-1.648	-1.776	-0.372	2.285	11234	-1.888	-0.341	2.229	
- Item 24	-1.793	-0.883	0.481	2.387	12345	-2.066	-0.985	0.550	2.501
- Item 25	-0.004	-2.125	0.589	1.884	11234	-1.980	0.379	1.601	

Response categories of items 3, 4 and 26 were inverted for analysis.

* Adjacent response categories were collapsed while rescoring. For example, 11233 means that the first and second categories were collapsed into the new first category, the third category thus becoming the new second category, and the original fourth and fifth categories were collapsed to form the new third category.