Appendix 2: Models tested in confirmatory factor analysis and results

Article: Through the patients' eyes - Psychometric evaluation of the Experienced Patient-Centeredness Questionnaire (EPAT-64)
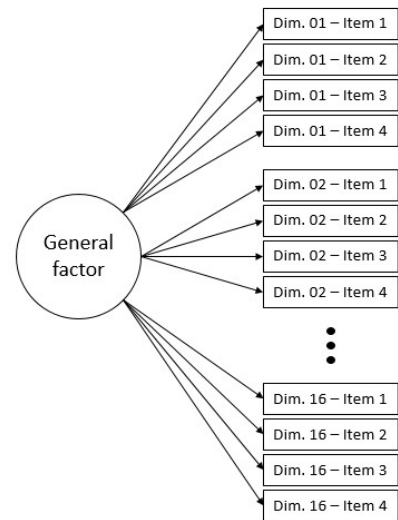
We developed items for each of the 16 dimensions of the integrative model of patient-centeredness.[1-3] Hence, we had a clear hypothesis which item should load on which dimension. We assumed that the 16 dimensions of PC are interrelated. Further, we hypothesized that there might be a general factor "patient-centeredness".

Based on those assumptions we tested five different models. Below you find a description of each model, including a sketch of the path model for with three dimensions. The real models included 16 specific dimensions.

Model 1 – Unidimensional model
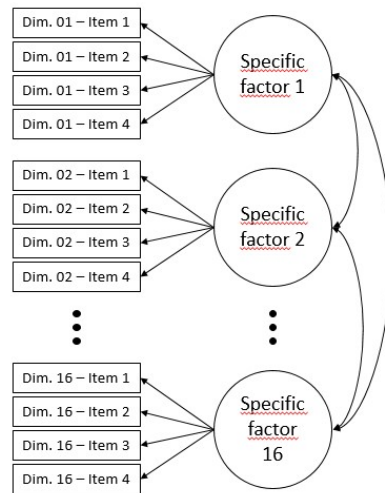- All items load on a single general factor.

We tested this model to test whether the fit increases when we consider the 16 dimensions given in the integrative model of patient-centeredness.

Model 2 – Correlated first-order dimension model
- All items load on their respective dimension.
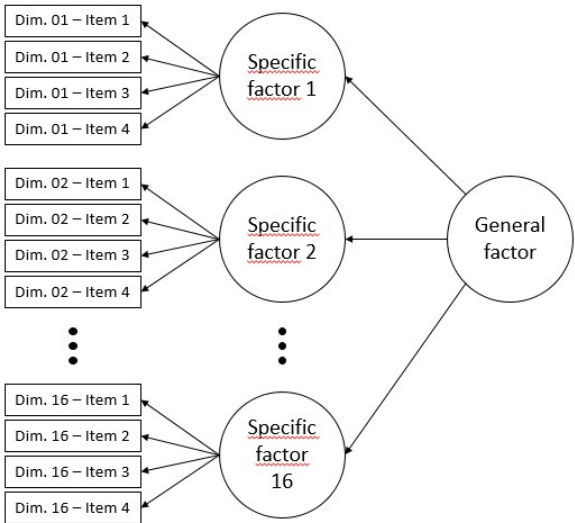- The dimensions correlate freely.

This model is a direct translation of the integrative model of patient-centeredness. The model makes no assumptions about the interrelations of the dimensions or about the existence of a general factor. Comparison with the next models allows us to investigate whether the fit increases when we introduce a general factor.

Model 3 – Hierarchical model

- All items load on their respective dimension.
- All dimensions load on a general factor.
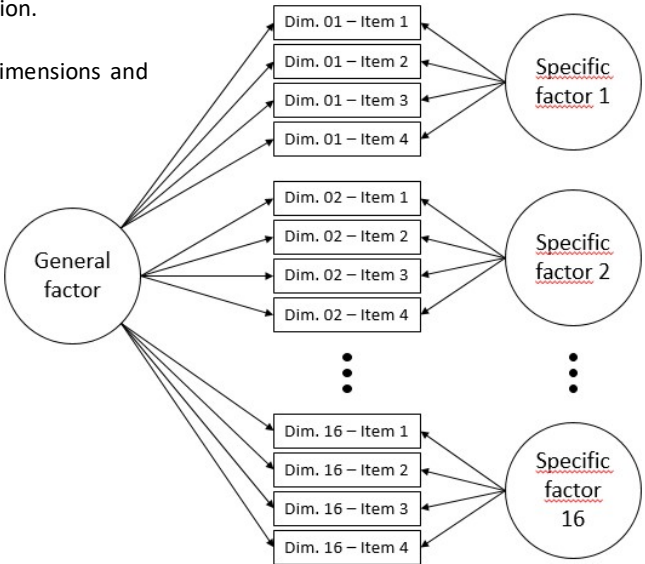- The dimensions correlate freely.

In this model all dimensions are associated with the general factor. There is no direct association between the general factor and the items. The effect of the general factor on the items is modelled indirectly through the dimensions.

Model 4 – Bifactor model with uncorrelated latent variables

- All items load on their respective dimension.
- All items load on a general factor.
- Correlations of all dimensions and of dimensions and the general factor are restricted to 0.
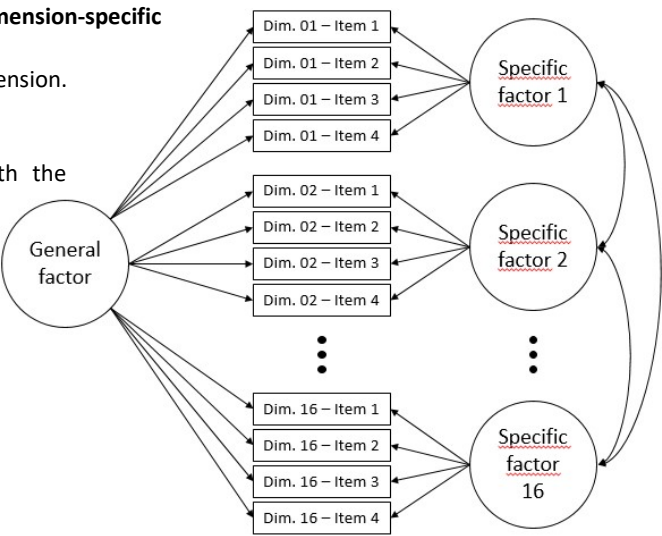
In contrast to a hierarchical model, bifactor models allows to model the role of the dimensions independently of the general factor.[4] This is the canonical form where the dimensions are not interrelated directly. Hence, all common variance between the dimensions are modelled solely by the influence of the general factor.

Model 5 – Bifactor model with correlated dimension-specific latent variables

- All items load on their respective dimension.
- All items load on a general factor.
- The dimensions correlate freely.
- Correlations of each dimension with the general factor are restricted to 0.

In this bifactor model we again modelled the dimensions role independently of the general factor. Yet, we also postulated that there are direct relationships between the dimensions that are not accounted for by the general factor.

All models were estimated using the robust maximum likelihood estimator and full information maximum likelihood to deal with missing values.

Supplemental material

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Table: Results of Confirmatory factor analysis – Beta (unstandardized loadings) and error variances

Dimension	Item	Outpatients			Inpatients		
		Beta specific factor	Beta general factor	Error variance	Beta specific factor	Beta general factor	Error variance
Essential characteristics of the clinician	Item 1	2.852	0.959	0.339	2.544	0.994	0.394
	Item 2	1.000	0.719	0.243	1.000	0.826	0.258
	Item 3	2.263	0.873	0.315	1.668	0.860	0.405
	Item 4	4.296	0.843	0.685	5.224	0.905	0.842
Clinician-patient relationship	Item 1	0.661	0.879	0.260	0.509	0.908	0.304
	Item 2	1.000	0.957	0.330	1.000	0.959	0.437
	Item 3	0.328	0.687	0.864	1.337	0.541	1.239
	Item 4	0.575	0.874	0.879	0.383	0.734	0.525
Patient as a unique person	Item 1	1.736	1.024	0.503	2.092	1.014	0.550
	Item 2	1.000	1.000	0.380	1.000	1.000	0.480
	Item 3	3.397	0.664	0.778	4.623	0.619	0.778
	Item 4	3.708	0.535	0.714	4.939	0.470	0.855
Biopsychosocial perspective	Item 1	1.096	0.539	0.859	0.982	0.489	0.834
	Item 2	1.000	0.670	1.217	1.000	0.365	1.270
	Item 3	0.514	0.711	0.987	0.453	0.667	1.088
	Item 4	1.153	0.469	0.958	1.051	0.413	0.934
Clinician-patient communication	Item 1	1.000	0.861	0.337	1.000	0.890	0.406
	Item 2	1.009	0.457	0.566	1.446	0.670	0.550
	Item 3	0.865	0.701	0.255	0.818	0.675	0.253
	Item 4	1.592	0.817	0.639	1.315	0.934	0.529
Integration of medical and non-medical care	Item 1	1.000	0.296	1.123	1.000	0.499	0.975
	Item 2	0.792	0.410	1.374	0.954	0.583	0.776
	Item 3	0.955	0.375	1.027	0.961	0.542	0.923
	Item 4	1.045	0.350	1.020	1.020	0.543	0.861
Teamwork and teambuilding	Item 1	1.000	0.369	0.576	1.000	0.879	0.338
	Item 2	1.351	0.500	0.469	0.937	0.934	0.354
	Item 3	1.226	0.715	0.951	1.153	0.836	0.471
	Item 4	0.213	0.576	1.706	0.274	0.760	1.929
Access to care	Item 1	0.782	0.673	0.977	0.237	0.936	0.784
	Item 2	1.000	0.412	0.588	1.000	0.651	0.510
	Item 3	0.987	0.330	0.988	1.561	0.750	0.368
	Item 4	0.776	0.374	1.022	0.128	0.660	0.484

Dimension	Item	Outpatients			Inpatients		
		Beta specific factor	Beta general factor	Error variance	Beta specific factor	Beta general factor	Error variance
Coordination and continuity of care	Item 1	0.501	0.609	1.295	0.467	0.782	1.227
	Item 2	1.000	0.375	2.307	1.000	0.820	1.403
	Item 3	0.364	0.827	0.410	0.311	0.969	0.425
	Item 4	1.057	0.595	2.561	0.592	1.019	0.890
Patient safety	Item 1	3.449	0.681	1.348	9.541	0.732	1.081
	Item 2	1.000	0.739	0.835	1.000	0.813	0.463
	Item 3	1.872	0.709	1.301	2.639	0.805	1.105
	Item 4	3.257	0.202	1.523	10.717	0.504	1.403
Patient information	Item 1	0.838	0.782	0.891	0.797	0.804	0.857
	Item 2	1.000	0.681	1.350	1.000	0.721	1.241
	Item 3	0.732	0.819	0.868	0.557	0.957	1.002
	Item 4	1.068	0.806	1.251	0.866	0.974	1.312
Patient involvement in care	Item 1	1.000	0.941	0.516	1.000	0.972	0.645
	Item 2	2.194	0.792	1.395	1.971	0.968	1.128
	Item 3	2.304	0.819	0.778	2.360	0.917	0.812
	Item 4	2.591	0.855	0.439	2.463	0.820	0.598
Involvement of family and friends	Item 1	1.000	0.382	0.722	1.000	0.556	0.734
	Item 2	1.011	0.408	0.604	1.010	0.545	0.677
	Item 3	0.975	0.495	1.106	0.809	0.853	1.255
	Item 4	0.927	0.537	1.277	0.906	0.793	1.065
Patient empowerment	Item 1	1.784	0.422	1.108	2.348	0.395	1.184
	Item 2	1.000	0.860	0.868	1.000	0.842	0.951
	Item 3	1.742	0.419	1.304	2.176	0.620	1.275
	Item 4	1.920	0.424	1.077	2.602	0.422	0.909
Physical support	Item 1	1.000	0.773	0.309	1.000	0.737	0.187
	Item 2	1.064	0.828	0.242	1.054	0.766	0.186
	Item 3	0.222	0.468	0.729	0.246	0.686	0.446
	Item 4	0.917	0.378	2.828	0.653	0.820	2.548
Emotional support	Item 1	0.998	0.891	0.454	0.771	0.836	0.639
	Item 2	1.000	0.790	0.533	1.000	0.599	0.503
	Item 3	1.251	0.684	0.457	1.109	0.364	0.633
	Item 4	1.101	0.415	2.073	0.879	0.599	2.217

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