LBP-TBQ:
Supplementary digital content 8

Multi-group analyses for measurement invariance – parameter estimates and model fit (ML)

Medication data

Multi-group CFA analyses were performed with the 16-item LBP-TBQ to examine measurement invariance (MI) for medication data between:

- Participants with nerve compression likely or not
- Participants with sciatica diagnosis reported or not
- Participants with pain duration less than 3 years versus more than 3 years
- Treatment-experienced versus treatment-naïve participants
- Across time (wave 1 versus wave 2)

Results are presented below and include model fit summaries, nested models comparisons, and graphical representation of the most appropriate models. For these analyses, multivariate outliers were first excluded from the sample to exclude this source of model misspecification; sensitivity analyses were performed selectively with the total samples, with similar results. Models reported here were estimated using maximum likelihood (ML).

A. Nerve compression likely (N= 144 cases -8 outliers = 136) or not (N=170 cases -10 outliers=160)

Model Fit Summary
CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Unconstrained	116	525.632	188	.000	2.796
Measurement weights	100	557.833	204	.000	2.734
Measurement intercepts	84	568.406	220	.000	2.584
Structural covariances	78	572.368	226	.000	2.533
Measurement residuals	58	609.395	246	.000	2.477
Saturated model	304	.000	0		
Independence model	64	2987.183	240	.000	12.447

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Unconstrained	.824	.775	.879	.843	.877
Measurement weights	.813	.780	.873	.848	.871
Measurement intercepts	.810	.792	.874	.862	.873
Structural covariances	.808	.797	.875	.866	.874

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Measurement residuals	.796	.801	.867	.871	.868
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Unconstrained	.078	.070	.086	.000
Measurement weights	.077	.069	.084	.000
Measurement intercepts	.073	.066	.081	.000
Structural covariances	.072	.065	.080	.000
Measurement residuals	.071	.064	.078	.000
Independence model	.197	.191	.204	.000

AIC

Model	AIC	BCC	BIC	CAIC
Unconstrained	757.632	788.245		
Measurement weights	757.833	784.223		
Measurement intercepts	736.406	758.573		
Structural covariances	728.368	748.952		
Measurement residuals	725.395	740.702		
Saturated model	608.000	688.226		
Independence model	3115.183	3132.072		

Nested Model Comparisons

Assuming model Unconstrained to be correct:

Model	DF	CMIN	P	NFI Delta-1	IFI Delta-2	RFI rho-1	TLI rho2
Measurement weights	16	32.201	.009	.011	.012	-.005	-.005
Measurement intercepts	32	42.774	.097	.014	.015	-.017	-.019
Structural covariances	38	46.736	.156	.016	.017	-.021	-.023
Measurement residuals	58	83.763	.015	.028	.030	-.026	-.028

Assuming model Measurement weights to be correct:

Model	DF	CMIN	P	NFI Delta-1	IFI Delta-2	RFI rho-1	TLI rho2
Measurement intercepts	16	10.573	.835	.004	.004	-.012	-.013
Structural covariances	22	14.535	.881	.005	.005	-.016	-.018
Measurement residuals	42	51.562	.148	.017	.019	-.021	-.022

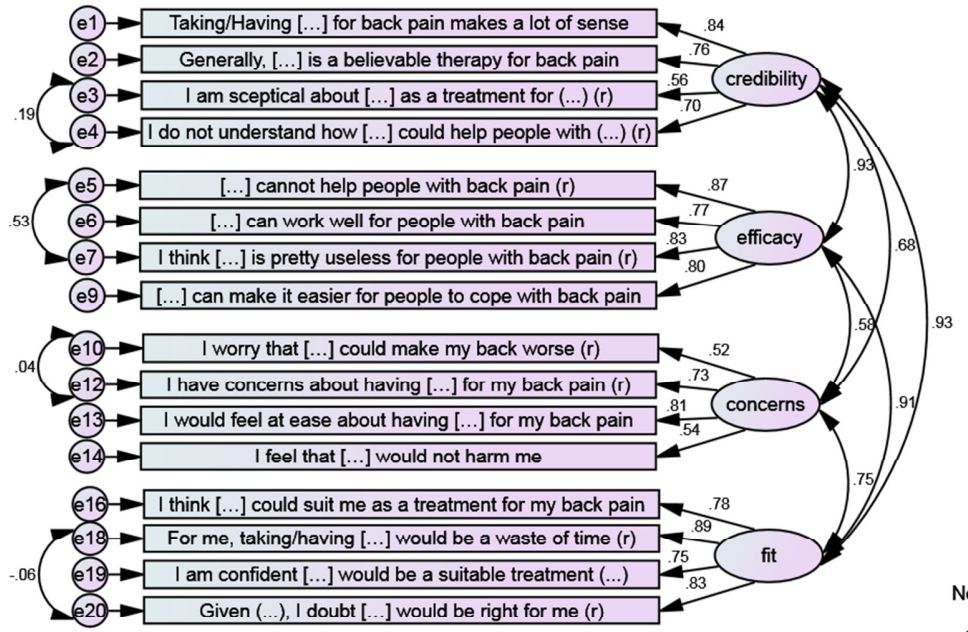
Assuming model Measurement intercepts to be correct:

Model	DF	CMIN	P	NFI Delta-1	IFI Delta-2	RFI rho-1	TLI rho2
Structural covariances	6	3.962	.682	.001	.001	-.004	-.004
Measurement residuals	26	40.990	.031	.014	.015	-.009	-.009

Assuming model Structural covariances to be correct:

Model	DF	CMIN	P	NFI Delta-1	IFI Delta-2	RFI rho-1	TLI rho2
Measurement residuals	20	37.027	.012	.012	.013	-.004	-.005

Unconstrained models:



B. Sciatica diagnosis reported (N=192 cases-13 outliers=179) or not (N=237 cases-17 outliers= 220)

Model Fit Summary

CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Unconstrained	116	566.183	188	.000	3.012
Measurement weights	100	578.199	204	.000	2.834
Measurement intercepts	84	600.614	220	.000	2.730
Structural covariances	78	621.222	226	.000	2.749
Measurement residuals	58	690.275	246	.000	2.806
Saturated model	304	.000	0		
Independence model	64	3959.973	240	.000	16.500

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Unconstrained	.857	.817	.900	.870	.898
Measurement weights	.854	.828	.900	.882	.899
Measurement intercepts	.848	.835	.898	.888	.898
Structural covariances	.843	.833	.894	.887	.894
Measurement residuals	.826	.830	.880	.883	.881
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Unconstrained	.071	.064	.078	.000
Measurement weights	.068	.061	.075	.000
Measurement intercepts	.066	.060	.072	.000
Structural covariances	.066	.060	.073	.000
Measurement residuals	.067	.062	.073	.000
Independence model	.198	.192	.203	.000

AIC

Model	AIC	BCC	BIC	CAIC
Unconstrained	798.183	820.209		
Measurement weights	778.199	797.187		
Measurement intercepts	768.614	784.564		
Structural covariances	777.222	792.032		
Measurement residuals	806.275	817.288		
Saturated model	608.000	665.723		
Independence model	4087.973	4100.125		

Nested Model Comparisons

Assuming model Unconstrained to be correct:

Model	DF	CMIN	P	NFI Delta-1	IFI Delta-2	RFI rho-1	TLI rho2
Measurement weights	16	12.017	.743	.003	.003	-.011	-.011
Measurement intercepts	32	34.431	.352	.009	.009	-.017	-.018
Structural covariances	38	55.039	.036	.014	.015	-.016	-.017
Measurement residuals	58	124.093	.000	.031	.033	-.012	-.013

Assuming model Measurement weights to be correct:

Model	DF	CMIN	P	NFI Delta-1	IFI Delta-2	RFI rho-1	TLI rho2
Measurement intercepts	16	22.415	.130	.006	.006	-.006	-.007
Structural covariances	22	43.023	.005	.011	.011	-.005	-.006
Measurement residuals	42	112.076	.000	.028	.030	-.002	-.002

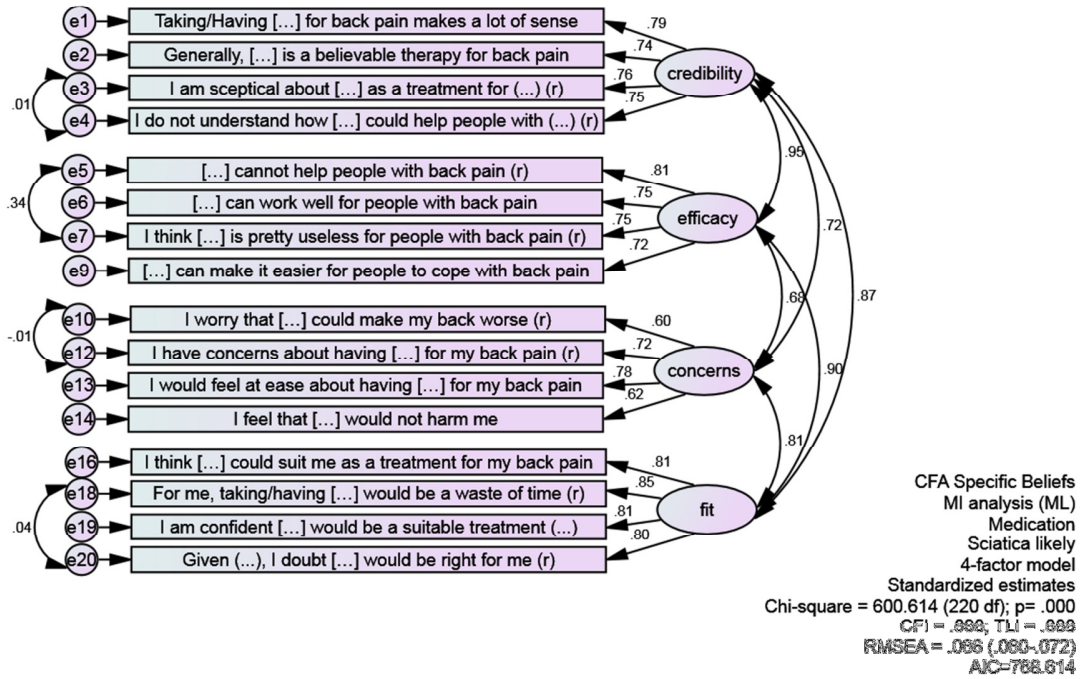
Assuming model Measurement intercepts to be correct:

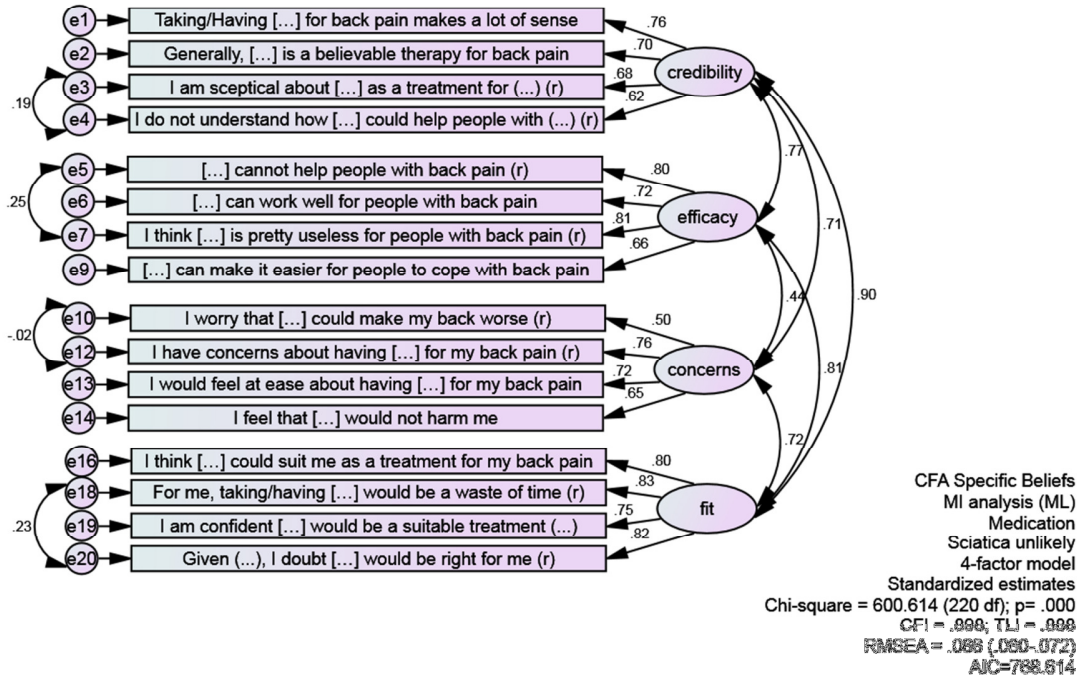
Model	DF	CMIN	P	NFI Delta-1	IFI Delta-2	RFI rho-1	TLI rho2
Structural covariances	6	20.608	.002	.005	.006	.001	.001
Measurement residuals	26	89.661	.000	.023	.024	.005	.005

Assuming model Structural covariances to be correct:

Model	DF	CMIN	P	NFI Delta-1	IFI Delta-2	RFI rho-1	TLI rho2
Measurement residuals	20	69.053	.000	.017	.018	.003	.004

Measurement intercepts models:





C. Pain duration less than 3 years (N = 151cases – 10 outliers=141) vs more than 3 years (N = 278 cases - 20 outliers=258)

Model Fit Summary

CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Unconstrained	116	551.528	188	.000	2.934
Measurement weights	100	568.064	204	.000	2.785
Measurement intercepts	84	586.929	220	.000	2.668
Structural covariances	78	599.860	226	.000	2.654
Measurement residuals	58	630.142	246	.000	2.562
Saturated model	304	.000	0		
Independence model	64	3946.142	240	.000	16.442

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Unconstrained	.860	.822	.903	.875	.902
Measurement weights	.856	.831	.903	.884	.902
Measurement intercepts	.851	.838	.902	.892	.901
Structural covariances	.848	.839	.900	.893	.899
Measurement residuals	.840	.844	.896	.899	.896
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Unconstrained	.070	.063	.077	.000
Measurement weights	.067	.061	.074	.000
Measurement intercepts	.065	.058	.071	.000
Structural covariances	.065	.058	.071	.000
Measurement residuals	.063	.057	.069	.000
Independence model	.197	.192	.203	.000

AIC

Model	AIC	BCC	BIC	CAIC
Unconstrained	783.528	807.912		
Measurement weights	768.064	789.085		
Measurement intercepts	754.929	772.587		
Structural covariances	755.860	772.257		
Measurement residuals	746.142	758.334		
Saturated model	608.000	671.903		
Independence model	4074.142	4087.596		

Nested Model Comparisons

Assuming model Unconstrained to be correct:

Model	DF	CMIN	P	NFI Delta-1	IFI Delta-2	RFI rho-1	TLI rho2
Measurement weights	16	16.536	.416	.004	.004	-.009	-.010
Measurement intercepts	32	35.402	.311	.009	.009	-.016	-.017
Structural covariances	38	48.333	.122	.012	.013	-.017	-.018
Measurement residuals	58	78.615	.037	.020	.021	-.023	-.024

Assuming model Measurement weights to be correct:

Model	DF	CMIN	P	NFI Delta-1	IFI Delta-2	RFI rho-1	TLI rho2
Measurement intercepts	16	18.865	.276	.005	.005	-.007	-.008
Structural covariances	22	31.797	.081	.008	.008	-.008	-.008
Measurement residuals	42	62.078	.024	.016	.017	-.014	-.014

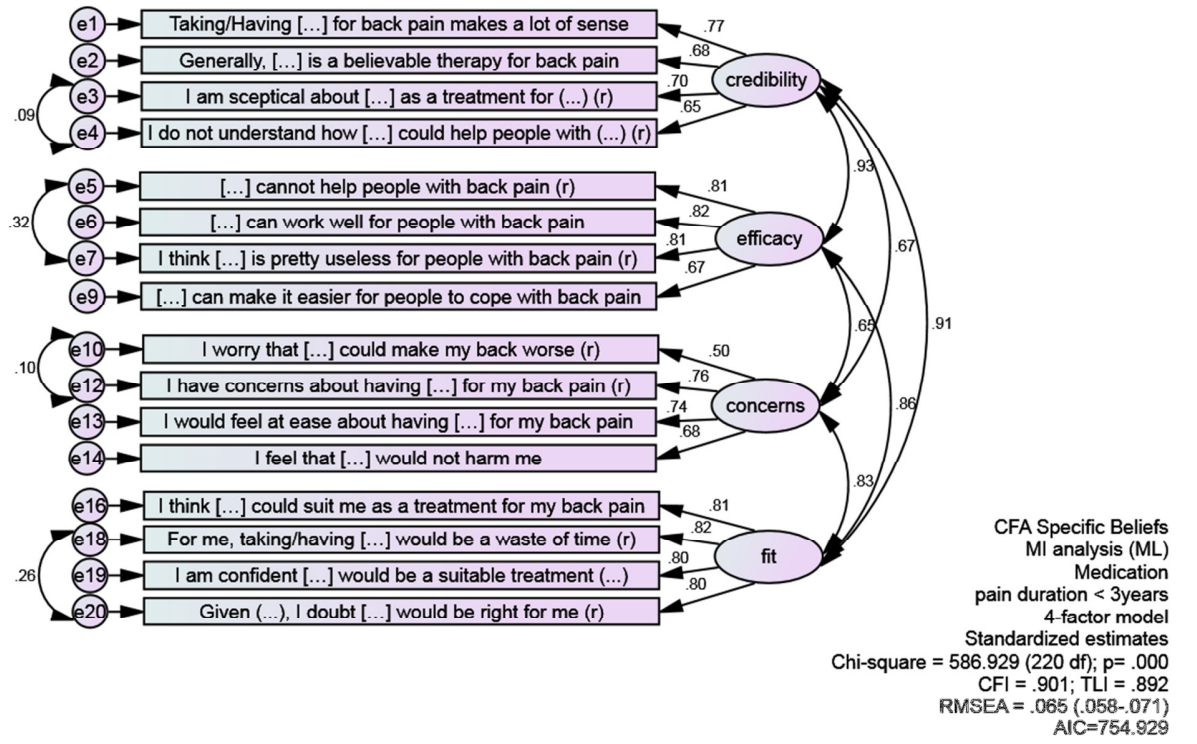
Assuming model Measurement intercepts to be correct:

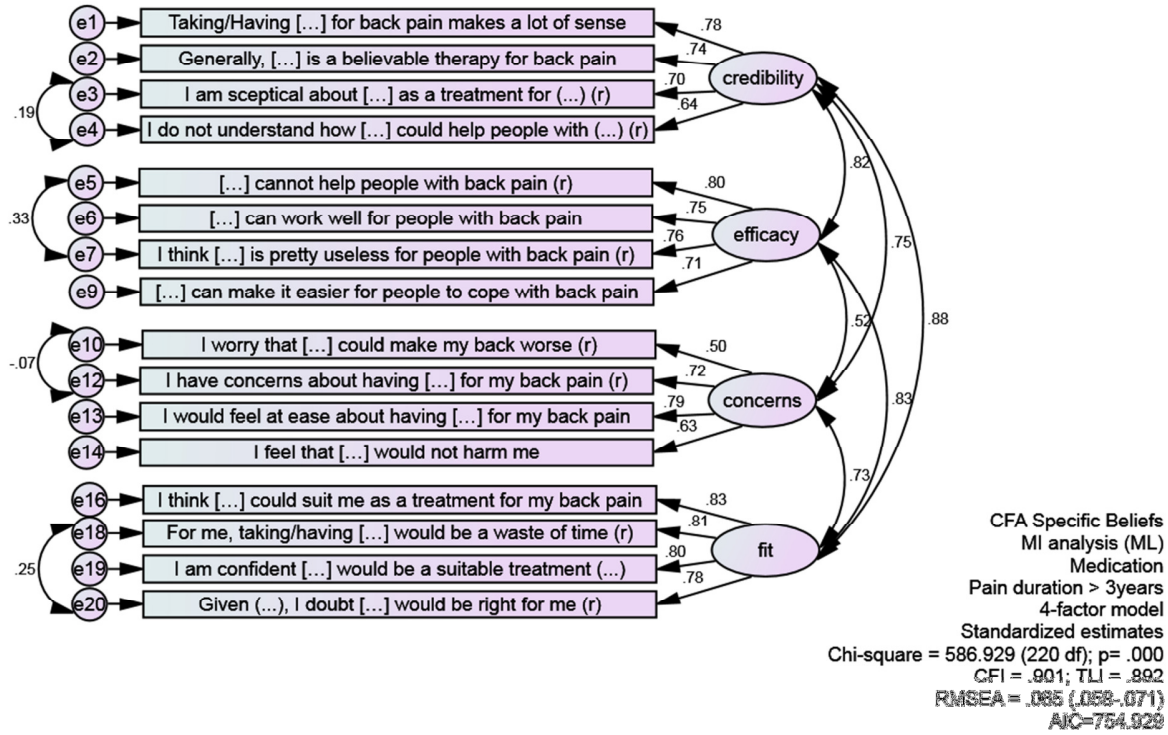
Model	DF	CMIN	P	NFI Delta-1	IFI Delta-2	RFI rho-1	TLI rho2
Structural covariances	6	12.931	.044	.003	.003	-.001	-.001
Measurement residuals	26	43.213	.018	.011	.012	-.006	-.007

Assuming model Structural covariances to be correct:

Model	DF	CMIN	P	NFI Delta-1	IFI Delta-2	RFI rho-1	TLI rho2
Measurement residuals	20	30.282	.065	.008	.008	-.006	-.006

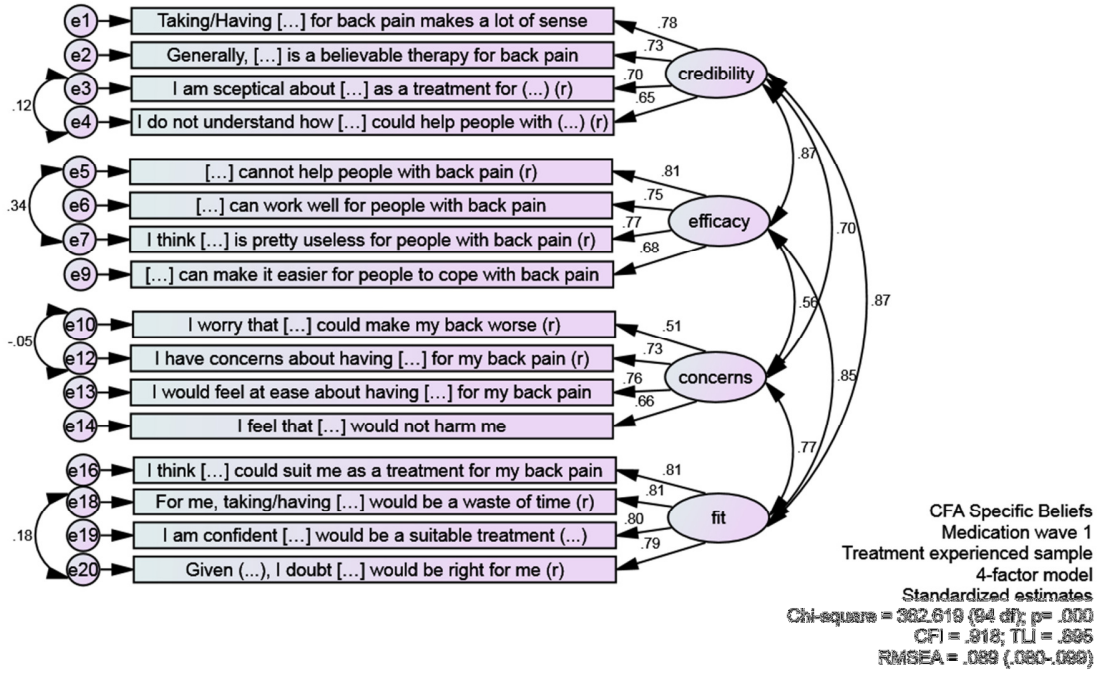
Measurement intercepts models:





D. Treatment-experienced (N = 389cases– 29 outliers=360) or not (N = 39 cases– 1 case with all data missing=38)

Sample size for no treatment experience too low - Model presented only for treatment experienced subsample:



E. Measurement invariance across time: wave 1 (N= 429 cases - 30 outliers=399) versus wave 2 (N=115 cases -4 outliers=111)

Model Fit Summary

CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Unconstrained	116	685.683	188	.000	3.647
Measurement weights	100	706.673	204	.000	3.464
Measurement intercepts	84	719.178	220	.000	3.269
Structural covariances	78	728.411	226	.000	3.223
Measurement residuals	58	780.003	246	.000	3.171
Saturated model	304	.000	0		
Independence model	64	4993.915	240	.000	20.808

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Unconstrained	.863	.825	.896	.866	.895
Measurement weights	.858	.834	.895	.876	.894
Measurement intercepts	.856	.843	.895	.885	.895
Structural covariances	.854	.845	.895	.888	.894
Measurement residuals	.844	.848	.888	.890	.888
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Unconstrained	.072	.066	.078	.000
Measurement weights	.070	.064	.075	.000

Model	RMSEA	LO 90	HI 90	PCLOSE
Measurement intercepts	.067	.061	.072	.000
Structural covariances	.066	.061	.072	.000
Measurement residuals	.065	.060	.071	.000
Independence model	.197	.193	.202	.000

AIC

Model	AIC	BCC	BIC	CAIC
Unconstrained	917.683	944.595		
Measurement weights	906.673	929.873		
Measurement intercepts	887.178	906.666		
Structural covariances	884.411	902.507		
Measurement residuals	896.003	909.459		
Saturated model	608.000	678.530		
Independence model	5121.915	5136.763		

Nested Model Comparisons

Assuming model Unconstrained to be correct:

Model	DF	CMIN	P	NFI Delta-1	IFI Delta-2	RFI rho-1	TLI rho2
Measurement weights	16	20.990	.179	.004	.004	-.009	-.009
Measurement intercepts	32	33.495	.395	.007	.007	-.018	-.019
Structural covariances	38	42.728	.275	.009	.009	-.020	-.021
Measurement residuals	58	94.320	.002	.019	.020	-.023	-.024

Assuming model Measurement weights to be correct:

Model	DF	CMIN	P	NFI Delta-1	IFI Delta-2	RFI rho-1	TLI rho2
Measurement intercepts	16	12.505	.709	.003	.003	-.009	-.010
Structural covariances	22	21.738	.476	.004	.005	-.012	-.012
Measurement residuals	42	73.330	.002	.015	.015	-.014	-.015

Assuming model Measurement intercepts to be correct:

Model	DF	CMIN	P	NFI Delta-1	IFI Delta-2	RFI rho-1	TLI rho2
Structural covariances	6	9.233	.161	.002	.002	-.002	-.002
Measurement residuals	26	60.825	.000	.012	.013	-.005	-.005

Assuming model Structural covariances to be correct:

Model	DF	CMIN	P	NFI Delta-1	IFI Delta-2	RFI rho-1	TLI rho2
Measurement residuals	20	51.592	.000	.010	.011	-.003	-.003

Structural covariances models: