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BACKGROUND

Although originally designed for evaluating the well-being of people with diabetes^{1,2} the 12-item and subsequent 16-item Well-being Questionnaire (W-BQ12³ and W-BQ16⁴) are not condition-specific measures. The W-BQ12 measuring depressed/anxious mood, energy, and positive well-being, has been validated for many patient groups.^{5,6} The W-BQ16, with an additional stress subscale has, to date, only been validated in diabetes⁴ but has face validity for people living with HIV. Given the dramatic changes in HIV care, well-being is an increasingly important consideration. Here we used confirmatory factor analysis (CFA) in evaluating the psychometric properties of the W-BQ16 for individuals living with HIV.

METHOD

Design: The study employed a survey design, with participants (Table 1) recruited from the UK and the US via the internet by Opinion Health. Participants chose to self-complete and return the questionnaire (via post) or complete it with a researcher (via telephone).

Table 1: Participant Details

Country	Age				Sex		Years since Diagnosis				Viral Load			
	N	Mean	SD	Min	Max	Men	Women	Mean	SD	Min	Max	Non-detectable	Detectable	Unsure
UK	128	47	9.10	25	72	99	29	12	8.30	1	30	116	9	3
US	127	51	11.7	25	78	104	20	19	9.40	0	36	116	9	2

Measures: The W-BQ16 consists of four 4-item subscales labelled Negative Well-Being (including depressed mood and anxiety), Energy, Positive Well-Being and Stress. Respondents give answers on a 4-point scale ranging from 'All the time' (scored as 3) to 'Not at all' (scored as 0). Two items from the Energy subscale are reverse scored (Item 6: dull & sluggish, Item 7: tired, exhausted). Higher scores indicate that the participant has more frequently experienced depressed/anxious mood (negative-well-being), energy (after reversing the two negatively worded energy items), positive well-being and stress on the respective subscales. Subscale scores range from 0 to 12. A General Well-Being score can also be computed by adding the subscale scores for Negative Well-being and Stress and then subtracting this subtotal from 24. The Energy item scores and Positive Well-being scores are then added. Scores can range from 0 to 48. Higher General Well-Being scores indicate greater well-being.

Model Fit Statistics: In order to assess CFA model fit, the following fit statistics were used. Comparative fit index (CFI) and Tucker Lewis Index (TLI): values of 0.90 indicate reasonable fit and values above 0.95 indicate a good-fitting model, Root Mean Square of Approximation (RMSEA): values <0.08 indicate a close fit, Weighted Root Mean Square Residual (WRMR): values <1.0 indicate adequate fit. Factor loadings: represent the strength of the association between the latent variable and the observed variable. Factor loadings >0.4 are considered acceptable for scale items. Cronbach's alpha was used to assess internal consistency reliability: values >0.7 indicate good reliability.

RESULTS

Hypothesised Model: Drawing on previous research with diabetics⁴ the CFA model of the W-BQ16 hypothesises *a priori* that responses to the W-BQ16 can be explained by four factors: negative well-being, energy, positive well-being and stress. The current model was run using Mplus version 7 software.⁷

Table 2: Pearson *r* Correlations between W-BQ16 subscales

	UK Data				US Data			
	Negative Well-Being	Energy	Positive Well-Being	Stress	Negative Well-Being	Energy	Positive Well-Being	Stress
Negative Well-Being	1	-0.496**	-0.613**	0.696**	1	-0.609**	-0.606**	0.721**
Energy		1	0.633**	-0.490**		1	0.619**	-0.619**
Positive Well-Being			1	-0.569**			1	-0.591**
Stress				1				1

Table 2 shows Pearson's *r* correlation coefficients for the W-BQ16 subscales. As predicted, negative well-being was negatively related to energy, negatively related to positive well-being, and positively related to stress. Positive well-being was positively related to energy and negatively related to stress.

ENQUIRIES & ACKNOWLEDGEMENTS

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Information on this and other questionnaires: Visit www.healthpsychologyresearch.com
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RESULTS

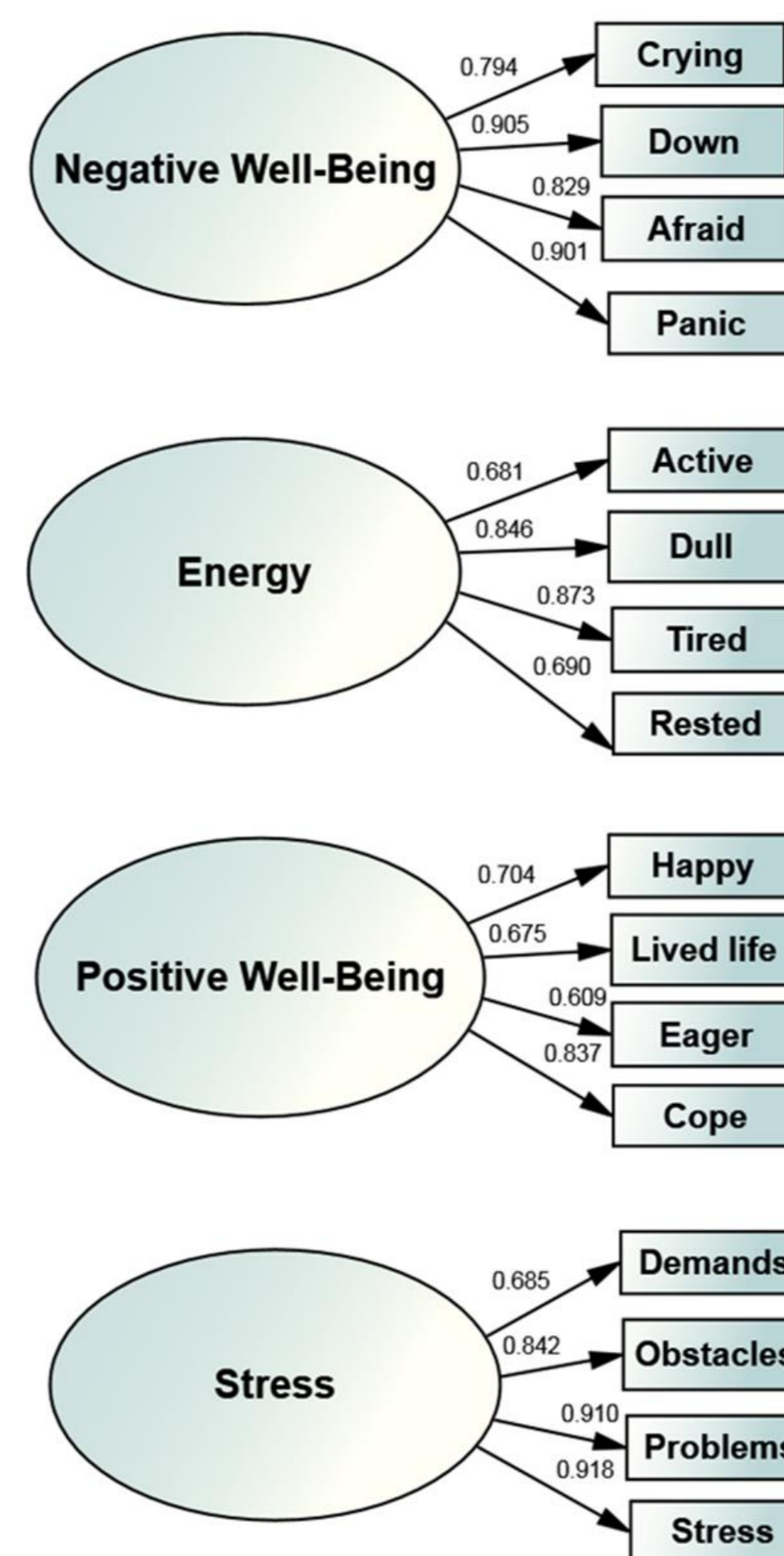


Figure 1: W-BQ16 CFA Model UK Data

Model Fit: UK Data: The fit statistics for W-BQ16 UK Model revealed a good fit to the data: CFI = 0.969, TLI = 0.962, RMSEA = 0.082 [95% CI = 0.063 – 0.10] and WRMR = 0.810.

Examination of the individual factor loadings (Figure 1) shows strong factor loadings, all of which were significantly ($p < 0.001$) related to their appropriate construct. Reliability (Table 3) for each 4-item subscale was good (>0.7) and for the total General Well-Being scale was excellent (>0.9).

Table 3: W-BQ16 Subscale Internal Consistency Reliability UK Data

Well-Being 16 (W-BQ16) Questionnaire Items	Alpha if Item Deleted			
	Negative Well-Being	Energy	Positive Well-Being	Stress
W-BQ 1: Crying	0.842			
W-BQ 2: Down	0.835			
W-BQ 3: Afraid	0.840			
W-BQ 4: Panic	0.820			
W-BQ 5: Energy		0.777		
W-BQ 6: Dull		0.771		
W-BQ 7: Tired		0.746		
W-BQ 8: Rested		0.787		
W-BQ 9: Happy			0.654	
W-BQ 10: Lived Life			0.696	
W-BQ 11: Eager			0.724	
W-BQ 12: Cope			0.689	
W-BQ 13: Demands				0.851
W-BQ 14: Obstacles				0.828
W-BQ 15: Problems				0.799
W-BQ 16: Stress				0.855
Subscale Alpha	0.870	0.817	0.748	0.870
General Well-Being Alpha = 0.919				

Model Fit: US Data: The fit statistics for W-BQ16 US Model also revealed a good fit to the data: CFI = 0.977, TLI = 0.972, RMSEA = 0.075 [95% CI = 0.055 – 0.09] and WRMR = 0.79.

Examination of the individual factor loadings (Figure 2), shows strong factor loadings, all of which were significantly ($p < 0.001$) related to their appropriate construct. Reliability (Table 4) for each 4-item subscale was good (>0.8) and for the total General Well-Being scale was excellent (>0.9).

Table 4: W-BQ16 Subscale Internal Consistency Reliability US Data

Well-Being 16 (W-BQ16) Questionnaire Items	Alpha if Item Deleted			
	Negative Well-Being	Energy	Positive Well-Being	Stress
W-BQ 1: Crying	0.811			
W-BQ 2: Down	0.811			
W-BQ 3: Afraid	0.836			
W-BQ 4: Panic	0.820			
W-BQ 5: Energy		0.861		
W-BQ 6: Dull		0.794		
W-BQ 7: Tired		0.785		
W-BQ 8: Rested		0.822		
W-BQ 9: Happy			0.761	
W-BQ 10: Lived Life			0.787	
W-BQ 11: Eager			0.759	
W-BQ 12: Cope			0.787	
W-BQ 13: Demands				0.852
W-BQ 14: Obstacles				0.821
W-BQ 15: Problems				0.810
W-BQ 16: Stress				0.812
Cronbach's Alpha	0.858	0.857	0.820	0.862
General Well-being Alpha = 0.932				

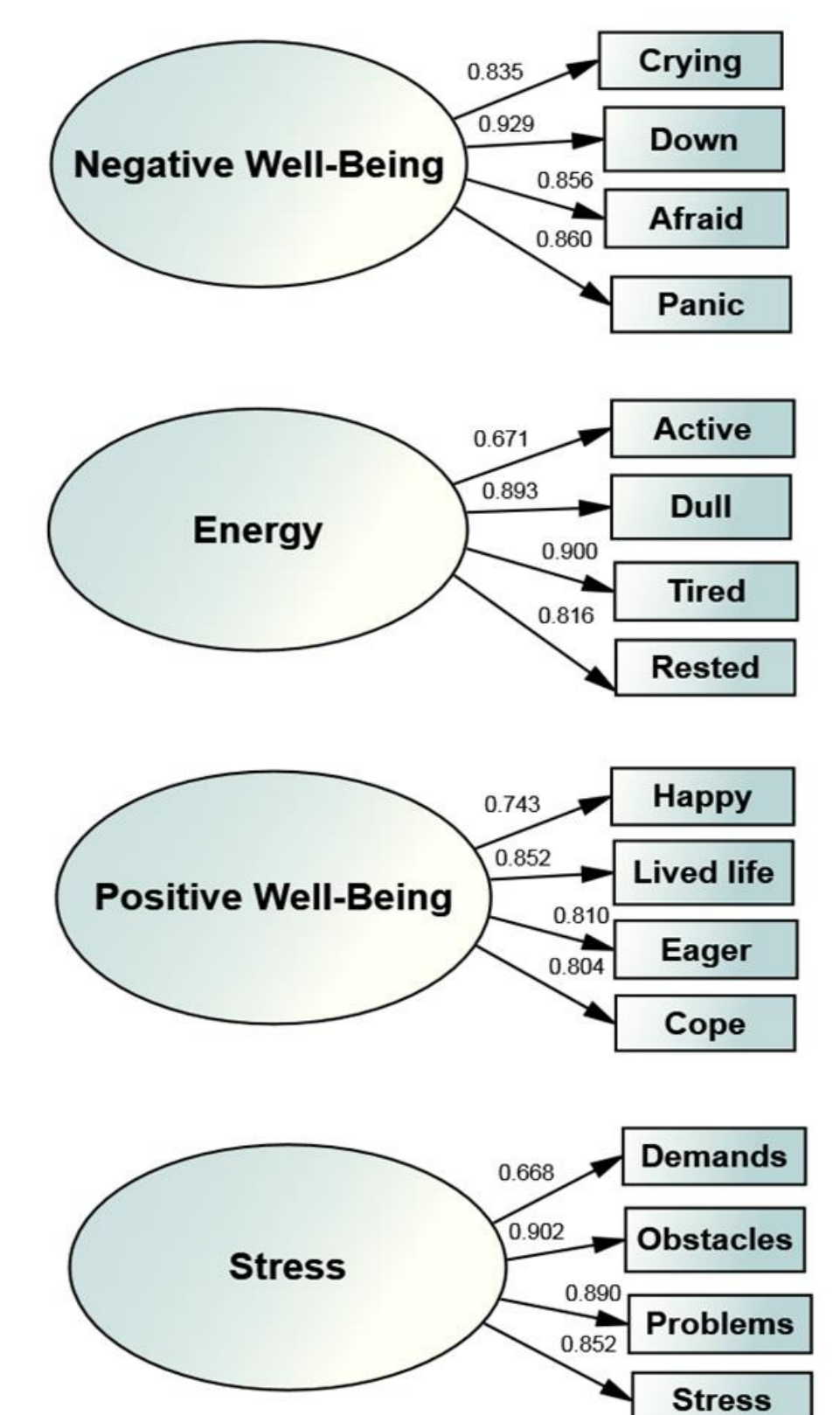


Figure 2: W-BQ16 CFA Model US Data

CONCLUSIONS

The four-factor model of the W-BQ16 accurately represents the data and is an appropriate measure of well-being for individuals living with HIV. A generic instrument, the W-BQ16 is also suitable for the general population and other patient groups, allowing for research comparing different populations. It is suitable for use in clinical trials and in routine clinical practice to evaluate the well-being of people with HIV on different treatments.

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