Royal Holloway
University of London

Measuring psychological well-being in adult growth hormone deficiency (GHD)

CV McMillan[1], C Bradley[1], J Gibney[2], DL Russell-Jones[3] and PH Sönksen[2]

[1]Health Psychology Research, Dept of Psychology, Royal Holloway, University of London, Egham, Surrey, TW20 0EX, UK. [2]St Thomas' Hospital, London, [3]Royal Surrey County Hospital, Guildford

Introduction

A lack of growth hormone (GH) in adulthood may lead to reduced psychological well-being. GH replacement therapy in adult GHD is not the norm in the UK, as there is controversy about whether the benefits outweigh the financial and other costs of daily injections. Sensitive measures of psychological outcomes are required to measure the effects of treatment.

Objectives

To evaluate the psychometric properties of 3 measures of psychological well-being, for use with adults with GHD.

Measures

- The General Well-being Index (GWBI)
  - British version[1] of the (American[2]) Psychological General Well-being Index (PGWB), the most frequently used well-being questionnaire in adult GHD research
  - 22 items (same items as PGWB, slight differences in wording)
  - no validated subscales (the PGWB has 6 subscales, but not validated for adult GHD).
- The 22-item Well-being Questionnaire (W-BQ22)[3]
  - 4 subscales of Depression, Anxiety, Energy and Positive Well-being.
  - 14 positively- and 8 negatively-worded items.
- The 12-item Well-being Questionnaire (W-BQ12)[4]
  - 3 subscales of 4 items, (each selected from the W-BQ22)
    - Negative Well-being (4 negatively-worded items)
    - Energy (2 positively- and 2 negatively-worded items)
    - Positive Well-being (4 positively-worded items).

Methods

- Cross-sectional questionnaire survey of adults with treated (N=91) or untreated (N=66) GHD.
- Randomised placebo-controlled study of 3 months' withdrawal of GH from 21 GH-treated adults, of whom 12 received placebo and 9 continued to receive GH treatment.

Results

Completion rates in survey > 99%, indicating high acceptability of all three questionnaires to respondents

Reliability was high in all 3 questionnaires (Table 1).

Table 1: Cronbach's alphas for whole scale totals

	Alpha	N	Subscale alphas
GWBI	0.959	152	>0.79*
W-BQ22	0.951	143	>0.79
W-BQ12	0.929	148	>0.85

*Although no subscales have previously been recommended for GWBI, the equivalent subscales to the PGWB were here examined.

Principal Component Analyses

(1) Forced 1-factor analyses, whole scales: all items loaded satisfactorily indicating the validity of calculating a total Well-being score for each questionnaire. Loadings:

GWBI (>0.58), W-BQ22 (>0.45), W-BQ12 (>0.6).

(2) Forced-factor analyses - evidence for subscales

- GWBI: evidence for Depression, Vitality and Self-control subscales, but other subscales split between factors.
- W-BQ22: Depression, Anxiety and Energy items loaded according to positive- or negative-wording. All further analysis was with shorter W-BQ12.
- W-BQ12: considerable evidence for expected 3 subscales. See Table 2.
  - Factor 1: all positively-worded Positive Well-being items.
  - Factor 2: all negatively-worded Negative Well-being items.
  - Factor 3: both negatively-worded Energy items (positively-worded Energy items double-loaded on Factors 1 and 3.

Table 2: W- BQ12 Forced 3-factor loadings in Principal Components Analysis (Varimax rotation)

	Component 1	2	3
*NegWB1 - crying spells	-0.357	**0.753**	0.185
*NegWB2 - downhearted	-0.313	**0.575**	0.511
*NegWB3 - afraid no reason	-0.125	**0.866**	0.127
*NegWB4 - upset panicky	-0.248	**0.805**	0.213
Ener1 - energetic active	0.691	-0.130	-0.436
*Ener2 - dull sluggish	-0.321	0.260	**0.825**
*Ener3 - worn out	-0.291	0.210	**0.862**
Ener4 - wake rested	0.646	-0.135	-0.449
PosWB1 - happy	**0.711**	-0.325	-0.327
PosWB2 - lived life wanted	**0.769**	-0.287	-0.176
PosWB3 - eager tackle tasks	**0.829**	-0.172	-0.285
PosWB4 - cope	**0.772**	-0.350	-0.093

* negatively-worded

Subgroup differences

Women had significantly reduced W-BQ12 Total and significantly more Negative Well-being than men, (Table 3), but there were no significant sex differences in GWBI Total.

Table 3: Sex differences in W-BQ12 scores

	W-BQ12 Total	W-BQ12 Negative Well-being
Women	20.55 ±8.23	3.68 ±2.89
Men	24.5 ±7.86	1.84 ±2.32
	t(154) = 3.05 p<0.05*	U = 1853.5, p<0.001*, N=157

*2-tailed

Sensitivity to change

Placebo-treated patients had (as anticipated) significantly lower W-BQ12 Energy at end-point when baseline scores had been partialed out (Table 4). The GWBI found no significant changes.

Table 4: Treatment effects on W-BQ12 Energy scores

	Estimated Marginal Mean (SE) at end-point
Placebo-treated	5.96 (0.48)
GH-treated	7.47 (0.56)
	F(1,16)=4.27, p=0.028 (1-tailed)

Table 5: Effect Size*
(Standardised Response Means)

GWBI Total	0.24
W-BQ12 Total	0.37
W-BQ12 Energy	0.55
W-BQ12 Positive Well-being	0.41
W-BQ12 Negative Well-being	0.11

*Effect sizes of 0.2 are small, 0.5 medium and 0.8 and above large.

Conclusions

The W-BQ12 is preferred over the W-BQ22 for :

- brevity
- improved structure with a balance of positively- versus negatively-worded items
- subscales of equal length.

Other aspects of validity and reliability are similar in both the W-BQ12 and W-BQ22.

The W-BQ12 is recommended in preference to the GWBI to measure well-being in adult GHD owing to:

- shorter length
- provision of useful subscales
- better performance in distinguishing between sub-groups
- superior sensitivity to change.

WELL-BEING QUESTIONNAIRE 12 (W-BQ12)

Please circle a number on each of the following scales to indicate how often you feel each phrase has applied to you in the past few weeks:

	all the time			not at all
1. I have crying spells or feel like it	3	2	1	0
2. I feel downhearted and blue	3	2	1	0
3. I feel afraid for no reason at all	3	2	1	0
4. I get upset easily or feel panicky	3	2	1	0
5. I feel energetic, active or vigorous	3	2	1	0
6. I feel dull or sluggish	3	2	1	0
7. I feel tired, worn out, used up, or exhausted	3	2	1	0
8. I have been waking up feeling fresh and rested	3	2	1	0
9. I have been happy, satisfied, or pleased with my personal life	3	2	1	0
10. I have lived the kind of life I wanted to	3	2	1	0
11. I have felt eager to tackle my daily tasks or make new decisions	3	2	1	0
12. I have felt I could easily handle or cope with any serious problem or major change in my life	3	2	1	0

Please make sure that you have considered each of the 12 statements and have circled a number on each of the 12 scales.

The W-BQ12 can be obtained from Prof. Clare Bradley, Psychology Dept., Royal Holloway, University of London, Egham, Surrey, TW20 0EX.

References

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