
The Well-Being Questionnaire (W-BQ)

12-item, 22-item and 28-item

USER GUIDELINES

1. Introduction

1.1 *The Instrument*

The W-BQ (© Bradley 1996, latest revision 2002) was originally designed in 1982 to provide a measure of depressed mood, anxiety and various aspects of positive well-being for use in a World Health Organisation study evaluating new treatments for the management of diabetes [1] and was first developed psychometrically in a Sheffield study of patients with Type 2 diabetes [2].

The 22-item Well-Being Questionnaire (W-BQ22) has been used extensively to evaluate the effects of new treatments and has proved sensitive to changes in treatment, e.g. from tablets to insulin injections [3]. It has also been shown to be sensitive to more subtle interventions, e.g. from NPH insulin to longer-acting insulin glargine [4]. Together with the Diabetes Treatment Satisfaction Questionnaire [5], the W-BQ22 was recommended by the World Health Organisation (WHO) and the International Diabetes Federation (IDF) for use in assessing psychological outcomes of diabetes care [6] with a view to improving those outcomes. A randomised controlled trial by Pouwer and colleagues demonstrated significant improvements in well-being attributable to monitoring well-being with the W-BQ12 [7].

In the past decade, the W-BQ22 has been further developed to provide a shorter, more balanced 12-item measure of psychological well-being (the W-BQ12) [8-11]. This has proven highly sensitive to the benefits of switching from traditional insulin injections to flexible, intensive insulin therapy [12] and compares well with the W-BQ22 parent instrument [4].

Although the W-BQ22 and W-BQ12 are suitable for use with people with diabetes, they are not diabetes-specific. Recently, a longer version (the W-BQ28) has been developed, incorporating a Generic Stress subscale and Diabetes-specific Negative Well-Being, Diabetes-Specific Positive Well-Being and Diabetes-Specific Stress subscales [13]. The W-BQ28 has also proved highly sensitive to the benefits of flexible, intensive insulin therapy [14, 15].

1.2 *Target Population*

The W-BQ is designed for use with adults and older adolescents (aged 16+) with Type 1 or Type 2 diabetes. It may be administered by mail or in the clinic, for a range of purposes including:

1. an assessment tool with individuals;
2. an assessment tool with groups of patients;
3. a broad cross-sectional survey instrument;
4. a routine part of clinical audit cycles;
5. an outcome measure for clinical research trials evaluating new treatments.

2. Procedures for use of the W-BQ

2.1 *Instructions to patients*

Patients need to be given verbal and/or written instructions that explain:

- why the questionnaire is being given to them
- what will be done with the information they provide
- how the questionnaire can be returned
- what, if any, discussion they might have with their health professionals about their responses

Sample patient information sheets are included, which may be adapted to suit particular circumstances [see Appendix 1].

2.2 *Anonymity*

Whether patients can remain anonymous will depend entirely on how you intend to use the W-BQ. If it is to be used as a broad cross-sectional survey instrument or as a routine part of clinical audit cycles, then it may be appropriate for patients to remain anonymous. In this way, patients can be assured that no-one will be able to identify them. However, in these circumstances it will not be possible to discuss any problems identified with the patient.

If the W-BQ is to be used to evaluate the success of a particular intervention, e.g. a change in insulin, it may also be appropriate for patients to remain anonymous. However, when evaluating a new treatment, it is likely to be more useful for research purposes (and for patient care) if patients' responses before and after the intervention can be matched. The easiest way to do this is to ask patients to provide their names.

If the W-BQ is to be used as an intervention tool with individual patients, then it would be usual to ask the patient to write their name on the questionnaire and for them to be told that their responses will be kept on their file. Keeping records of patients' responses over time allows you to track any changes in well-being scores and, in particular, to be aware of deterioration in well-being which may require intervention.

If patients are to be anonymous then steps need to be taken to ensure that it is not possible to identify respondents. If questionnaires are to be returned in the clinic, a confidential reply box is needed. This will allow respondents to return completed questionnaires so that they are not visible to onlookers. If mailed returns are to be used, a stamped addressed reply envelope marked 'confidential' needs to be provided.

2.3 *Sampling*

If the W-BQ is to be used in a survey, as part of an audit cycle or as an evaluation instrument, a representative picture of psychological well-being will be achieved only if there is an adequate cross-section of patients responding. Every person attending the clinic during a particular time period might be given the opportunity to complete a questionnaire, though this procedure will be likely to sample more people with problems who return to the clinic more frequently for appointments. If there are different clinics, for example where evening or Saturday clinics are held for those who are working and weekday clinics are held for other patients, the different types of clinics will need to be sampled separately. Separate analysis of the different patient groups is likely to be the most informative and useful.

For a fully representative sample, it is necessary to take a random sample from the overall clinic list or to include only patients attending for annual review, which involves all patients.

3. W-BQ Results

3.1 Individual clinical use

If the W-BQ is being used as an assessment tool with individual patients, it may not be necessary to enter the data onto a spreadsheet or to combine the individuals' responses with others. The subscale scores can most usefully be calculated and examined for the individual [see Section 3.3 for scoring guidelines] and compared with published data for relevant subgroups of people with diabetes [1, 2, 4, 7, 10-12].

For the purposes of monitoring an individual's psychological well-being over time, it may be useful to enter subscale and total General Well-being scores on to a spreadsheet so that trends can be observed easily [see Section 3.3].

3.2 Data entry

If the W-BQ is to be used in a survey, as part of an audit cycle or as an evaluation instrument for a group of patients, individual responses to the W-BQ items will need to be combined and analysed in relation to other data. This can be done by:

- entering the data directly into a statistics package such as SPSS, **or**
- creating a spreadsheet, either by hand or in a computer package such as Microsoft Excel or Lotus 123. Instructions for creating a spreadsheet are included [see Appendix 2].

3.3 Scoring

The following are guidelines on scoring, recoding and computing for the full length W-BQ22 and the now usually preferred, shorter version - the W-BQ12. Scoring guidelines for the diabetes-specific W-BQ28 are provided in Appendix 3. If you have any further queries or suggestions, please contact Professor Bradley [see Section 5].

3.3.1 Scoring Items (on W-BQ12 and W-BQ22)

The W-BQ items are scored on a scale from 0 ("not at all") to 3 ("all the time").

3.3.1.1 In-between scores

If a respondent answers in-between choices (e.g. 1 ½ or 2 ½), we recommend you code as 1.5, 2.5 etc.

3.3.1.2 If a question is answered twice

- If the scores that have been circled are *next* to each other (e.g. 1 & 2), then we recommend you take the mid-point between them (i.e. 1.5), as this is unlikely to be a mistake and more likely to represent difficulty in choosing a score.
- However, if the two answers are not immediately next to each other (e.g. 1 and 3), we suggest you treat this as missing and then follow the instructions for missing scores below.

3.3.1.3 If a respondent circles a number on the scale and also writes a word

If, for example, the patient circles a number and writes "sometimes" on top of the answer, take the number circled.

3.3.1.4 If the words have been circled

If a respondent writes in any words at the extremes of each scale, (e.g. “never” or “always”), you can code as 0 for the “not at all” end and 3 for the “all the time” end, to record this. However, to our knowledge this has never happened with the W-BQ.

3.3.1.5 If any respondents have themselves written -1 or 4 as a response

Treat as in 3.3.1.4 above, i.e. re-score as 0 or 3. Again, to our knowledge this has never happened.

3.3.1.6 Recoding W-BQ22

On the Depression, Anxiety and Energy subscales, some questions are positively-worded and some are negatively-worded. Some items scores on the W-BQ22 need to be reversed prior to computing subscale totals [see Section 3.3.2.1]. There are other occasions when recoding of certain items might be needed:

- **Individual scores:**

If wanting to look at individual scores within the subscales, these are easier to read if they are reversed so that all items read in the direction of the subscale meaning (i.e. higher scores meaning more Depression, Anxiety, Energy and Positive Well-being).

- **Treatment of missing scores:**

Refer to the advice on treatment of missing scores for the W-BQ22 and W-BQ12 [Section 3.3.2.3, in particular Step 1].

- **Psychometric analysis of W-BQ22:**

If performing psychometric analyses, the relevant items in the Depression, Anxiety and Energy subscales need to be reversed for any *reliability* analysis. As shown below, when analysing reliability by *subscale*, the positively-worded items on the Depression and Anxiety subscales need to be reversed, and for Energy the negatively-worded items need to be reversed. However, when analysing by the *whole scale*, all the negatively worded items on Depression, Anxiety and Energy need to be reversed. (Factor analysis is not affected and the raw scores can be used).

The relevant items should be recoded as follows:

$$(3 = 0) (2 = 1) (1 = 2) (0 = 3)$$

Table 1 indicates which version of a variable (raw or recoded) to use for which reliability analysis:

W-BQ22	Use <i>raw scores</i>	Use <i>recoded scores</i>

Subscales	<ul style="list-style-type: none"> • Dep: 2, 5 • Anx: 7, 8, 9, 10 • Energy: 13, 16 • PosWell: 17-22 (i.e. all) 	<ul style="list-style-type: none"> • Dep: 1, 3, 4, 6 • Anx: 11, 12 • Energy: 14, 15 • PosWell: none
Whole scale	<ul style="list-style-type: none"> • Dep: 1, 3, 4, 6 • Anx: 11, 12 • Energy: 13, 16 • PosWell: 17-22 (i.e. all) 	<ul style="list-style-type: none"> • Dep: 2, 5 • Anx: 7, 8, 9, 10 • Energy: 14, 15 • PosWell: none

Table 1: W-BQ22 raw and recoded scores for reliability analyses

3.3.1.7 Recoding the W-BQ12

On the shortened version of the Well-being Questionnaire, the only scale that has a mixture of positively- and negatively-worded items is the Energy subscale. Section 3.3.2.1 gives the computation equations for subscales and scale total which include the necessary reversing procedures.

If individual items need to be reversed for reliability analyses and other purposes, the recoding is again:

$$(3 = 0) (2 = 1) (1 = 2) (0 = 3)$$

Table 2a below summarises which version of a variable to use for which reliability analysis:

W-BQ12	Use raw scores	Use recoded scores
Subscales	<ul style="list-style-type: none"> • NegW-B12: 1-4 (i.e. all) • Energy: 5, 8 • PosW-B12: 9-12 (i.e. all) 	<ul style="list-style-type: none"> • NegW-B12: none • Energy: 6, 7 • PosW-B12: none
Whole scale	<ul style="list-style-type: none"> • NegW-B12: none • Energy: 5, 8 • PosW-B12: 9-12 (i.e. all) 	<ul style="list-style-type: none"> • NegW-B12: 1-4 (i.e. all) • Energy: 6, 7 • PosW-B12: none

Table 2a: W-BQ12 raw and recoded scores for reliability analyses (data collected using the W-BQ12)

In some cases researchers may have used the W-BQ22, analysed that and then wish to analyse the W-BQ12 from those same W-BQ22 data. In this scenario, the relevant question numbers would be those from the W-BQ22 [see Table 2b below], rather than those shown in Table 2a.

W-BQ12	Use raw scores	Use recoded scores
Subscales	<ul style="list-style-type: none"> • NegW-B12: 2, 5, 8, 9 • Energy: 13, 16 • PosW-B12: 17, 19, 20, 21 	<ul style="list-style-type: none"> • NegW-B12: none • Energy: 14, 15 • PosW-B12: none
Whole scale	<ul style="list-style-type: none"> • NegW-B12: none • Energy: 13, 16 • PosW-B12: 17, 19, 20, 21 	<ul style="list-style-type: none"> • NegW-B12: 2, 5, 8, 9 • Energy: 14, 15 • PosW-B12: none

*Table 2b: W-BQ12 raw and recoded scores for reliability analyses
(data collected using the W-BQ22)*

3.3.1.8 Missing scores

- **Initial entry:** Score all blanks as missing scores.
- **Psychometric Analysis:** All missing values to be coded as missing and not substituted for in psychometric analysis. This applies to analyses including principal components analysis and reliability analysis (including α coefficient of internal consistency reliability).
- **Treatment of missing scores when computing scale total:** Scale averages can sometimes be used, depending in part on the language of the questionnaire [see Section 3.3.2.3].

3.3.2 Computing Subscale and Scale Totals

3.3.2.1 The W-BQ22 can be scored as 4 subscales:

- Depression (Items 1-6)
- Anxiety (Items 7-12)
- Energy (Items 13-16)
- Positive W-B (Items 17-22)

The subscales are computed using the following formulae:

Depression: 12 - item 1 + item 2 - item 3 - item 4 + item 5 - item 6

Anxiety: 6 + item 7 + item 8 + item 9 + item 10 - item 11 - item 12

Energy: 6 + item 13 - item 14 - item 15 + item 16

Positive W-B: Item 17 + item 18 + item 19 + item 20 + item 21 + item 22

The total is then computed using the following formula:

General Well-being: 36 - Depression - Anxiety + Energy + Positive W-B

If there are no other reasons for reversing any variables [see Sections 3.3.1.6 and 3.3.1.7], these formulae obviate the need to reverse any scores before computing the total. This has the added benefit of leaving the original data in their raw form.

3.3.2.2 The W-BQ12 can be scored as 3 subscales, each of 4 items:

- Negative Well-being (Negative W-B12) - Items 1-4
- Energy - Items 5-8
 - Positive Well-being (Positive W-B12) - Items 9-12

The Negative W-B12 consists of items 2 and 5 from the original W-BQ22 (Depression subscale), and items 8 and 9 from the original W-BQ22 (Anxiety subscale). All four Negative Well-being items are negatively worded. The Energy subscale is retained unchanged, consisting of 2 positively and 2 negatively worded items. The Positive W-B12 consists of items 17, 19, 20 and 21 from the original 6-item Positive Well-being subscale of the W-BQ22. All four Positive Well-being items are positively worded.

The subscale totals and overall total are computed as follows:

Negative W-B12: Add the 4 items together
Energy: 6 + item 5 - item 6 - item 7 + item 8
Positive W-B12: Add the 4 items together

General Well-being: 12 - Negative W-B12 + Energy + Positive W-B12

3.3.2.3 Treatment of Missing Scores

The following applies to the original English versions of the W-BQ and may apply in other languages, but has not been checked in all other languages. The following also applies only to non-psychometric analyses; in any psychometric analyses to be conducted, such as on validated versions but with a different type of population or on new translations, *no* missing values are to be substituted, as to do so would distort the true factor structure and internal consistency reliability.

W-BQ22

- a) *If no more than 2 scores are missing from each of the Depression, Anxiety or Positive Well-being subscales, or no more than 1 score is missing from the Energy subscale, each of the subscale totals can be estimated as follows:*

- Step 1: Reverse item scores where necessary¹ (i.e. subtract item score from 3). We recommend that this recoding is done to produce new variables as required, rather than substituting with newly recoded variables;
- Step 2: Sum the existing item (or reversed item) scores appropriate for each subscale;
- Step 3: Divide this sum by the number of existing item scores;
- Step 4: Multiply by the number of items in the subscale (i.e. 6 for Depression, Anxiety and Positive Well-being and 4 for Energy) to give the estimated subscale total.
- Step 5: Use this computation to estimate subscale scores [16], providing the number of missing values does not exceed the number tolerable without unacceptable loss of reliability for the language version in use.

- b) *If more than these numbers of scores are missing:*

¹ Depression items 1,3,4 & 6; Anxiety items 11 & 12; and Energy items 14 & 15 (none on the Positive Well-being subscale).

Do not recode, but leave items and subscale coded as missing.

- c) *If more than 2 subscales have estimated subscale totals*

Do not compute a total General Well-being score.

W-BQ12

- a) *If no more than 1 score is missing from any of the subscales, each of the subscale totals can be estimated as follows:*

Step 1: Reverse item scores where necessary² (i.e. subtract item score from 3). We recommend that this recoding is done to produce new variables as required, rather than substituting with newly recoded variables;

Step 2: Sum the existing item (or reversed item) scores appropriate for each subscale;

Step 3: Divide this sum by the number of existing item scores (i.e. 3);

Step 4: Multiply by the number of items in the subscale (i.e. 4).

Step 5: Use this computation to estimate subscale scores [16], providing the number of missing values does not exceed the number tolerable without unacceptable loss of reliability for the language version in use.

- b) *If more than one score is missing:*

Do not recode, but leave items and subscale coded as missing.

- c) *If more than 1 subscale has an estimated subscale total*

Do not compute a Total Well-being score.

3.4 Displaying Results

It can be helpful to turn the W-BQ results into a series of charts for ease of interpretation. Instructions for doing so, together with sample charts are provided [see Appendix 4].

4. Note: Conditions of use of the W-BQ12, 22 and 28

The Well-Being Questionnaire is made available to users by formal arrangement with the copyright holder, Professor Clare Bradley. Requests should be made to Professor Bradley [see Section 5]. A user agreement is necessary to avoid breach of copyright and to ensure that the latest and most appropriate version of the questionnaire is used.

² Only Energy items 6 & 7

5. Contact Information

For permission to use the W-BQ12, 22 or 28 and to ensure that you have the most up-to-date version, please contact:

Professor Clare Bradley
Address: Health Psychology Research
Department of Psychology
Royal Holloway
University of London
Egham
Surrey
TW20 0EX
UK

E-mail: c.bradley@rhul.ac.uk

Website: www.healthpsychologyresearch.com

Fax: +44 (0)1784 414657

Tel: +44 (0)1784 443714 (administration)
+44 (0)1784 443708 (direct line)

References

1. Bradley C (1994) The Well-being Questionnaire. In Bradley C (Ed) *Handbook of Psychology and Diabetes: a guide to psychological measurement in diabetes research and practice*. Chur, Switzerland: Harwood Academic Publishers.
2. Bradley C and Lewis KS (1990) Measures of psychological well-being and treatment satisfaction developed from the responses of people with tablet-treated diabetes. *Diabetic Medicine* **7**, 445-451.
3. Witthaus E, Stewart J and Bradley C (2000) Improved psychological outcomes after initiation of insulin treatment in patients with Type II diabetes. *Diabetologia* **43**, suppl 1 A205.
4. Witthaus E, Stewart J and Bradley C (2001) Treatment satisfaction and psychological well-being with insulin glargine compared with NPH in patients with Type 1 diabetes. *Diabetic Medicine* **18**, 619-625.
5. Bradley C (1994) The Diabetes Treatment Satisfaction Questionnaire: DTSQ. In Bradley C (Ed) (1994) *Handbook of Psychology and Diabetes: a guide to psychological measurement in diabetes research and practice*. Chur, Switzerland: Harwood Academic Publishers.
6. Bradley C and Gamsu DS for the psychological well-being working group of the WHO/IDF St. Vincent Declaration Action Programme for Diabetes (1994). Guidelines for encouraging psychological well-being: Report of a working group of the World Health Organisation Regional Office for Europe and International Diabetes Federation European Region St. Vincent Declaration Action Programme for Diabetes. *Diabetic Medicine* **11**, 510-516.
7. Pouwer F, Snoek F J, van der Ploeg H M, Adèr H J & Heine R J (2001) Monitoring of psychological well-being in outpatients with diabetes: effects on mood, HbA1c, and the patient's evaluation of the quality of diabetes care: a randomized controlled trial. *Diabetes Care*, **24**, 1929-1935.
8. Bradley C (2000) The 12-item Well-Being Questionnaire. Origins, current stage of development, and availability. *Diabetes Care* **23**, 875.
9. Plowright R, Witthaus E and Bradley C (1999) Evaluating the 12-item Well-being Questionnaire for use in multinational trials. *Quality of Life Research* **8**(7), 650.
10. Pouwer F, Snoek FJ, van der Ploeg HM, Adèr HJ and Heine RJ (2000). The Well-being Questionnaire: evidence for a three-factor structure with 12 items (W-BQ12). *Psychological Medicine* **30**, 455-462.
11. Pouwer F, van der Ploeg H M, Adèr H J, Heine R J & Snoek F J (1999) The 12-item Well-Being Questionnaire: an evaluation of its validity and reliability in Dutch people with diabetes. *Diabetes Care* **22**(12), 2004-2010.
12. DAFNE Study Group* (2002) Training in flexible, intensive insulin management to enable dietary freedom in people with type 1 diabetes: the Dose Adjustment For Normal Eating (DAFNE) randomised controlled trial. *British Medical Journal*, **325**, 746-749 (full 6 page version of paper published on BMJ website <http://bmj.com/cgi/content/full/325/7367/746>). (Trial showing major improvement in well-being with the W-BQ12).
* Amiel S, Beveridge S, Bradley C, Gianfrancesco C, Heller S, James P, McKeown N, Newton D, Newton L, Oliver L, Reid H, Roberts S, Robson S, Rollington J, Scott V, Speight J, Taylor C, Thompson G, Turner E & Wright F.
13. Speight J, Barendse S and Bradley C (2000) The W-BQ 28: further development of the Well-being Questionnaire to include diabetes-specific as well as generic subscales and new stress subscales. *Proceedings of the British Psychological Society* **8**(1), 21.

14. Speight J and Bradley C (2002) The W-BQ28 measure of generic and diabetes-specific well-being is shown to be reliable, valid and sensitive to change in DIABQoL+ and DAFNE studies. *Diabetic Medicine* **19** (suppl. 2), 10.
15. Speight J and Bradley C (2002) The DAFNE Trial: Analysis of the W-BQ28. A report on the effects of DAFNE training on generic and diabetes-specific well-being. Internal report to the DAFNE Steering Group.
16. Mitchell J and Bradley C (2001) Psychometric evaluation of the 12-item Well-being Questionnaire for use with people with macular disease. *Quality of Life Research* **10**, 465-473.
17. Riazi A, Bradley C, Barendse S and Ishii H (2006) Development of the Well-being questionnaire short-form in Japanese: the W-BQ12. *Health and Quality of Life Outcomes* **4**:40.
<http://www.hqlo.com/content/pdf/1477-7525-4-40.pdf>

Appendix 1

Example of Patient Information Sheet (for anonymous completion*)

"We are looking at how we can improve the well-being of people attending this clinic. We would be glad if you would give a few minutes of your time to completing this questionnaire.

Please do not write your name on the questionnaire, as it is intended to be anonymous. If you do not wish to complete it please return the questionnaire (see below), and write on it any comments you would like to make.

If you would like some help in filling out the questionnaire, perhaps because of eyesight problems**[insert information on how the person can obtain assistance, eg 'ask the receptionist, who will get someone to help you']**.

We ask you to seal the completed questionnaire in the envelope provided and place it in the box **[give location of collection box, eg 'at the reception desk']**.

The results will be fed back by **[describe the way in which feedback will be given to patients, e.g. 'a poster which will be put up on the notice board in the clinic']**. It will not be possible to provide feedback on individual responses. Your responses will be combined with those of other people and used to inform proposals for improving the well-being of people attending the clinic.

Thank you for your participation. Your responses will be put to good use in helping to improve treatment for people with diabetes."

[Name and position of principal investigator]

[Name(s) and position(s) of clinic consultants and / or diabetes specialist nurses sharing responsibility for and giving support to the study]

Note: If only one name is given, plural wording such as 'we are' will need to be changed to the singular where appropriate throughout the document.

*** This information sheet stresses the protection of identity. It would be appropriate to ensure anonymity if the W-BQ was to be used in a survey or as part of an audit cycle. It may also be appropriate if the W-BQ was to be used as an instrument for evaluating the**

success of an intervention aimed at a group of people. It would not be appropriate to ensure anonymity if the W-BQ was to be used on a one-to-one basis (see next page) or in clinical trials where outcome data need to be related to other information on individual participants.

Example of Patient Information Sheet (for one-to-one contact)

"We are looking at how we can improve the well-being of people attending this clinic. If there are ways in which your well-being is impaired, we may be able to discuss ways of improving your well-being. We would be glad if you would give a few minutes of your time to completing this questionnaire.

It is important that you write your name on the questionnaire so that we can keep your responses with your medical notes and take action where needed.

If you would like some help in filling out the questionnaire, perhaps because of eyesight problems**[insert information on how the person can obtain assistance, e.g. 'ask the receptionist, who will get someone to help you']**.

We ask you to bring the completed questionnaire to your next appointment with**[insert name of Dr, nurse, dietitian etc. who will be examining the answers given and considering possible interventions]** who will go through your responses with you and discuss with you how your well-being might be improved.

Thank you for completing this questionnaire. Your responses will help us to provide you with diabetes care that avoids damaging your psychological well-being and, where necessary, take steps to improve your well-being.

[Name and position of principal investigator]

[Name(s) and position(s) of clinic consultants and / or diabetes specialist nurses sharing responsibility for and giving support to the study]

Note: If only one name is given, plural wording such as 'we are' will need to be changed to the singular where appropriate throughout the document.

Appendix 2

Data entry by hand, or using a spreadsheet package such as Excel

Probably the simplest way to handle the data is to create a spreadsheet table of responses for each item. The first column will record 'patient number' and then there will be one column for each W-BQ item score. The first 6 patients of an example spreadsheet for the W-BQ12 are given in Figure 1.

Figure 1: Sample spreadsheet

Pt no	W-BQ12 item no.											
	1	2	3	4	5	6	7	8	9	10	11	12
1	0	0	1	0	3	1	1	2	2	2	1	2
2	1	1	0	1	2	0	1	2	3	1	2	2
3	0	1	1	1	2	0	1	2	2	2	1	2
4	0	1	0	1	2	0	0	3	2	3	2	3
5	2	2	1	1	2	1	0	2	1	2	3	3
6	1	0	1	0	1	0	1	2	2	2	1	2

For each individual, record their responses to each item according to the scoring guidelines described in Section 3.3.

The subscale and scale totals for each respondent can be obtained following the instructions described in Section 3.3. Note the instructions regarding missing data.

When all patient responses have been recorded in the spreadsheet, mean scores for each subscale and scale can be obtained.

Appendix 3

Scoring Guidelines for the W-BQ28

There is no overall score for the W-BQ28, only a series of subscale and scale scores, as indicated below. It would not be sensible to combine the generic and diabetes-specific well-being scores to form one total score. Furthermore, it is more interesting to be able to compare the generic with the diabetes-specific as this will provide greater information about the need for intervention and what type of intervention may be useful (i.e. referred to a clinical psychologist or psychiatrist for general problems with depression and/or anxiety or special attention from the diabetes team to review diabetes care and diabetes treatment or improve diabetes education as appropriate).

Subscales

Subscales can be formed from the following combination of items:

- Generic Negative Well-being: items 1-4
- Energy: items 5-8
- Generic Positive Well-being: items 9-12
- Generic Stress: items 13-16
- Diabetes-Specific Negative Well-being: items 17-20
- Diabetes-Specific Stress: items 21-24
- Diabetes-Specific Positive Well-being: items 25-28

Scores for each of the above scales range from 0-12, as each is a 4-item scale with item scores ranging from 0-3.

Reversing items & Missing data

The only items that need to be reversed are items 6 and 7 of the Energy subscale. The reason for this is that Energy contains two positively worded (5 and 8) and two negatively worded (6 and 7) items. Generic and Diabetes-specific Positive Well-being only contain positively worded items. All other subscales only contain negatively worded items. Thus, subscales are scored so that a higher score indicates more of the particular emotional state described by the subscale label. For the treatment of missing scores, please refer to the advice given in Section 3.3.

Scales

Several scale scores can also be derived from the subscales of the W-BQ28. The computations for calculating the scale scores are given below:

- *W-BQ12 (standard scale):*
General Well-being = 12 - Gen Neg WB + Energy + Gen Pos WB
- *W-BQ16 (W-BQ12 + Generic Stress subscale):*
General Well-being = 24 - Gen Neg WB - Gen Stress + Energy + Gen Pos WB
- *Comparison W-BQ12 (substituting Stress for Energy so that it can be compared with Diabetes-Specific Scale - see below):*
General Well-being = 24 - Gen Neg WB - Gen Stress + Gen Pos WB
- *Diabetes-Specific W-BQ12:*
Diabetes-Specific Well-being = 24 - DiabSp Neg WB - DiabSp Stress + DiabSp Pos WB

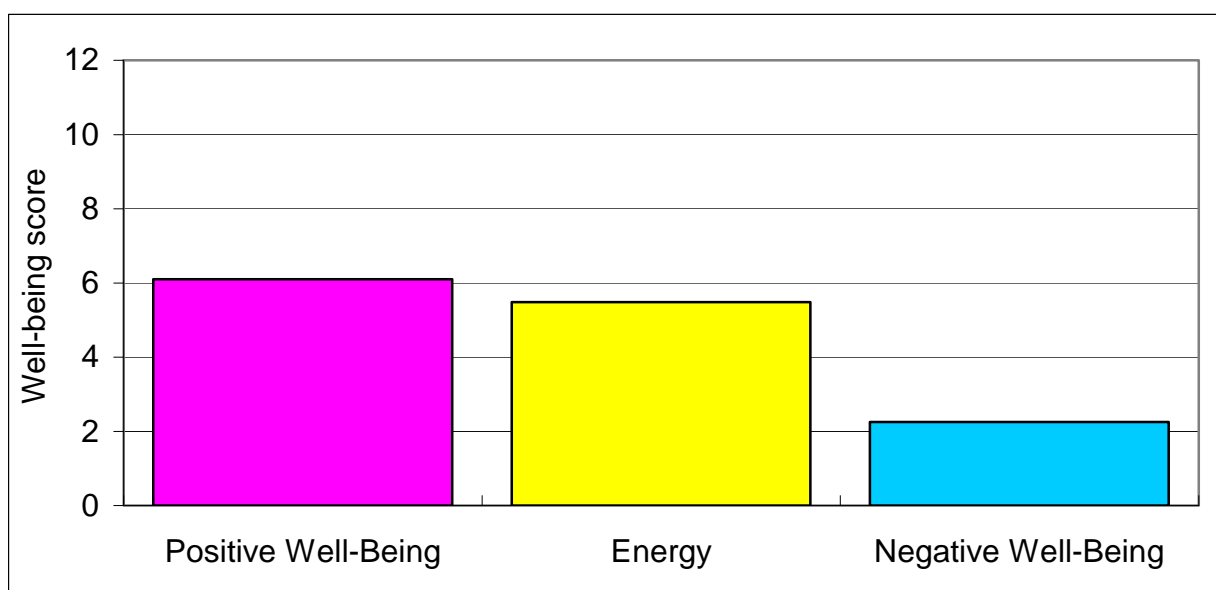
Appendix 4

Suggestions for displaying data

The W-BQ subscale and scale scores can be used to create a chart that shows the results in a format that is easy to follow. You may wish to:

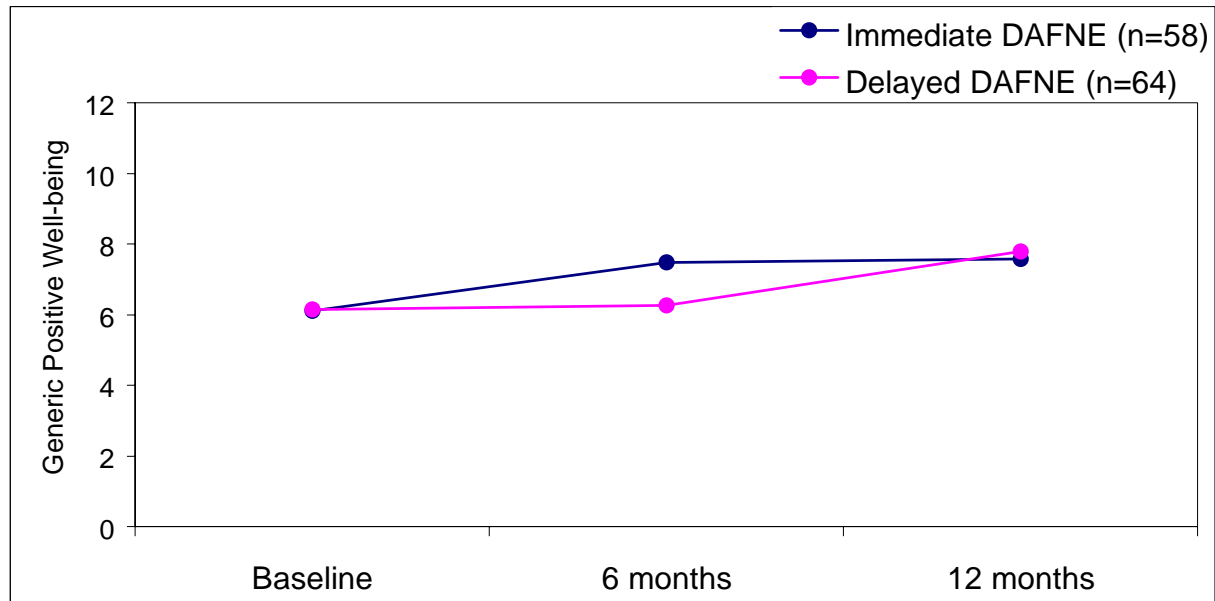
- compare subscale totals within your sample [see Figure 1]
- compare subgroups of respondents for individual subscales or scales [see Figure 2]

Figure 1: Positive Well-Being, Energy and Negative Well-Being at baseline in the DAFNE trial (Immediate DAFNE group only)



Data extracted from: Speight J and Bradley C. The DAFNE Trial: Analysis of the W-BQ28. A report on the effects of DAFNE training on generic and diabetes-specific well-being). Internal report to the DAFNE Steering Group.

Figure 2: The effect of DAFNE training on Positive Well-being (W-BQ12)



Main effect: $F=50.4$, $p<0.0001$ (linear), $F=0.0$, $p=0.86$ ns (quadratic)
Group x Time effect: $F=0.2$, $p=0.67$ ns (linear), $F=18.8$, $p<0.0001$ (quadratic)

Extracted from: Speight J and Bradley C. The DAFNE Trial: Analysis of the W-BQ28. A report on the effects of DAFNE training on generic and diabetes-specific well-being). Internal report to the DAFNE Steering Group.