

Brief report

Normative data for the HADS from a large non-clinical sample

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Objectives. To provide normative data for the Hospital Anxiety Depression Scale (HADS).

Design. Repeated measures and correlational.

Methods. The HADS was administered to a non-clinical sample, broadly representative of the general adult UK population ($N = 1792$) in terms of the distributions of age, gender and occupational status. Correlational analysis was used to determine the influence of demographic variables on HADS scores.

Results. Demographic variables had only very modest influences on HADS scores. The reliability of the HADS is acceptable; the Anxiety and Depression scales are moderately correlated (.53). Tables to convert raw scores to percentiles are presented for females and males.

Conclusions. The present normative data allow clinicians to assess the rarity of a given HADS score, and thus provide a useful supplement to existing cut-off scores.

The Hospital Anxiety and Depression Scale (HADS) is a brief (14-item), self-report measure of anxiety and depression developed by Zigmond and Snaith (1983). It was developed for use in general medical out-patient clinics but is now widely used in clinical practice and research (Herrmann, 1997).

At present, interpretation of the HADS is based primarily on the use of cut-off scores, although there is 'no single, generally accepted, cut-off score for the HADS' (Herrmann, 1997, p. 21). The test's authors recommended that, for the Anxiety and Depression scales alike, raw scores of between 8 and 10 identify mild cases, 11–15 moderate cases, and 16 or above, severe cases (Snaith & Zigmond, 1994).

An alternative, but complementary, approach is to refer an individual's score to normative values derived from a sample drawn from the general adult population. This

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approach would also be in keeping with the view that anxiety and depression should be regarded as dimensional rather than categorical constructs. However, as Herrmann (1997) notes in his extensive review of the HADS, 'Unfortunately there are no documented standard values for the English version' (p. 22).

The aims of the present study were to: (i) investigate the influence of demographic variables on HADS scores in the general adult population, (ii) provide norms for the HADS, and (iii) obtain estimates of the reliability of the HADS.

Method

Complete HADS data were collected from 1792 members of the general adult population (females = 978, males = 810). Participants were recruited from a wide variety of sources including commercial and public service organizations, community centres and recreational clubs. The mean age of the sample was 41.5 years (SD = 15.9, range = 18–91). The mean years of education was 13.8 (SD = 3.3). Each potential participant received an introductory letter, a HADS form and a form for recording demographic variables. The refusal rate was approximately 18%.

The social class of each participant was coded from their occupation (or former occupation). The percentage of participants in each social class band was as follows (for comparison purposes, the census-derived percentages for the general adult population are given in brackets): 1 = 12 (7), 2 = 39 (32), 3 = 32 (42), 4 = 9 (14) and 5 = 8 (5). The percentage of participants in each of four age bands (1 = 18–29-year-olds; 2 = 30–44; 3 = 45–59; and 4 = 60+) were as follows (the census-derived percentages are in brackets): 1 = 28 (27), 2 = 31 (25), 3 = 26 (22) and 4 = 15 (26).

Results

For the Anxiety scale, the mean score was 6.14 (SD = 3.76, median = 6); for Depression, 3.68 (SD = 3.07, median = 3); and for the Total scale, 9.82 (SD = 5.98, median = 9). Visual inspection of the distributions of raw scores revealed that all three scales were positively skewed. Kolmogorov–Smirnov tests confirmed that the distributions deviated highly significantly from a normal distribution (Z ranged from 4.17 to 4.39, all $ps < .001$). The reliabilities (Cronbach's α) were .82, .77 and .86 respectively. The correlation between the Anxiety and Depression scales was highly significant ($p < .001$) and moderate in magnitude ($r = .53$).

Females obtained significantly higher scores than males on the Anxiety scale ($t = 6.18$, $p < .001$), Depression scale ($t = 2.18$, $p < .05$) and Total scale ($t = 5.01$, $p < .001$). The relationships between the remaining demographic variables (age, years of education and social class) and the HADS scales were examined using correlations. Each of these variables was significantly correlated with at least one of the HADS scales. However, the size of these effects was very modest; the percentage of variance explained ranged from a low of 0.64% (years of education and Depression) to a high of 1.8% (age and Anxiety).

Given that the HADS raw scores were positively skewed, the means and SDs from a normative sample are not useful when interpreting an individual's score. Therefore, tables were constructed to convert raw scores on each of the HADS scales to percentiles. Separate conversion tables for females and males are presented in Appendices 1 and 2. On the Anxiety scale the percentages of the total sample classified as mild, moderate or severe using Snaith and Zigmond's (1994) criteria were 20.6, 10.0 and 2.6%, respectively. For the Depression scale, the corresponding percentages were 7.8, 2.9 and 0.7%.

Discussion

One basic aim of the present study was to examine the influence of demographic variables on HADS scores. It can be concluded that, with the exception of gender, the influence of these variables on HADS scores can be ignored for practical purposes. The significant effects observed resulted from the high statistical power conferred by the large sample size. The modest effects of demographic variables simplify clinical interpretation of the HADS and indicated that there was no need to stratify the sample by demographic variables other than gender when providing normative data.

Interpretation of HADS scores has been based primarily on the use of cut-off scores. These cut-offs were established by mapping raw scores against the ratings of severity provided by clinical judges. We suggest that the normative data presented here usefully complement the former approach by providing additional information on the degree of rarity of a given HADS score in the general adult population.

Although we see the percentile tables primarily as an aid to the interpretation of scores in clinical work with individuals (i.e. in general medical or mental health services), they could also be usefully employed to set inclusion or exclusion criteria for research purposes. In addition, given that basic demographic variables do not greatly influence HADS scores, the present summary statistics (i.e. means, SDs and medians) could be used to provide comparison standards for the scores obtained in studies of clinical groups.

The tabulation method in Appendices 1 and 2 was adopted to permit conversion of raw scores to percentiles for all three HADS scales using the same table. Because of this, and because of the granularity of raw scores, it can be seen that a given raw score can correspond to more than one percentile (e.g. for males on the Depression scale a raw score of 4 spans the 59th to 68th percentiles). When this occurs, the user should take the highest percentile.

The intention of providing normative data was not to replace the use of clinically derived cut-offs, but to provide supplementary information. However, as it transpires, the normative data raise questions concerning the existing cut-off scores. Fully 33% of the present sample obtained scores that exceeded what Snaith and Zigmond (1994) considered to be the 'normal' range on the anxiety scale (i.e. they obtained scores of 8 or more).

The fact that a substantial proportion of the general adult population endorsed a number of anxiety items is not in itself surprising. For example, Shepherd, Cooper, Brown, and Kalton's (1966) large-scale survey reported that between 30 and 40% of the general population suffer from anxiety to an extent that would benefit from clinical intervention. Nevertheless, for those who may wish to use cut-offs on the HADS to identify 'cases', it is unlikely that a cut-off that identifies such a substantial proportion of the general population would be of much utility, as it would include many cases with fairly mild anxiety symptoms. Therefore, it may be more appropriate to consider use of a cut-off of 10/11 (i.e. this would classify as cases only those categorized as moderate or severe); in the present study 12.6% of the sample met this criterion.

This latter percentage figure is broadly consistent with epidemiological studies that have employed well-validated classification systems (Horwath & Weissman, 1995). For example, in Meltzer, Gill, Petticrew, and Hinds' (1995) survey of 10,000 UK

households, the overall (1-week) prevalence of anxiety disorders was 13.9% (this percentage is based on the inclusion of cases diagnosed as 'mixed anxiety/depression').

The mean Anxiety score in the present sample (6.14) is higher, although not markedly so, than the means provided by Spinhoven *et al.* (1997) for three large samples of the general adult population in the Netherlands; mean scores ranged from 3.9 to 5.9 in this latter study.

The results for the Depression scale also suggest that, if clinically derived cut-off scores are used, the higher cut-off (i.e. 10/11) may be more appropriate. Using this cut-off, 3.6% of the present sample would be classified as cases. This is broadly consistent with estimates of the prevalence of depression derived from epidemiological studies (Horwath & Weissman, 1995), whereas the percentage identified using the lower cut-off of 7/8 (11.4%) substantially exceeds such estimates. The mean score on the Depression scale in the present sample (3.68) is consistent with those obtained in the Netherlands by Spinhoven *et al.* (1997); the means in their three samples ranged from 3.4 to 4.6.

Finally, studies of clinical samples have shown that Zigmond and Snaith's (1983) original conception of the HADS as measuring *independent* dimensions of anxiety and depression is untenable (Herrmann, 1997). The moderate correlation between the Anxiety and Depression scales in the present sample ($r = .53$) demonstrates that this also holds for the general adult population. Moreover, it suggests that (contrary to the advice of the test's authors) it would be legitimate to combine scores on the Anxiety and Depression scales to obtain a score on the Total scale were a measure of general psychological distress required.

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Appendix 1
Raw scores on the HADS converted to percentiles for females

Percentile	Anxiety	Depression	Total	Percentile	Anxiety	Depression	Total
1	0	0	1	51	6	3	10
2	0	0	1	52	7	3	10
3	1	0	1	53	7	3	10
4	1	0	2	54	7	3	10
5	1	0	2	55	7	3	10
6	1	0	2	56	7	3	10
7	1	0	3	57	7	4	11
8	2	0	3	58	7	4	11
9	2	0	3	59	7	4	11
10	2	0	3	60	7	4	11
11	2	1	3	61	7	4	11
12	2	1	3	62	8	4	11
13	2	1	4	63	8	4	12
14	2	1	4	64	8	4	12
15	2	1	4	65	8	4	12
16	3	1	4	66	8	5	12
17	3	1	4	67	8	5	12
18	3	1	5	68	8	5	13
19	3	1	5	69	8	5	13
20	3	1	5	70	9	5	13
21	3	1	5	71	9	5	13
22	3	1	5	72	9	5	14
23	3	1	5	73	9	5	14
24	4	1	6	74	9	5	14
25	4	1	6	75	9	6	14
26	4	1	6	76	9	6	14
27	4	1	6	77	9	6	15
28	4	1	6	78	10	6	15
29	4	2	6	79	10	6	15
30	4	2	6	80	10	6	15
31	4	2	6	81	10	6	15
32	4	2	7	82	10	7	16
33	4	2	7	83	10	7	16
34	4	2	7	84	10	7	16
35	5	2	7	85	11	7	17
36	5	2	7	86	11	7	17
37	5	2	7	87	11	8	17
38	5	2	8	88	11	8	18
39	5	2	8	89	12	8	19
40	5	2	8	90	12	8	19
41	5	2	8	91	12	9	20
42	5	2	8	92	13	9	20
43	5	2	8	93	13	9	21
44	6	2	9	94	13	10	22
45	6	3	9	95	14	10	22
46	6	3	9	96	14	11	24
47	6	3	9	97	15	12	25
48	6	3	9	98	16	13	27
49	6	3	9	99	18	15	29
50	6	3	9	100			

Note. Where a raw score corresponds to more than one percentile take the higher percentile.

Appendix 2
Raw scores on the HADS converted to percentiles for males

Percentile	Anxiety	Depression	Total	Percentile	Anxiety	Depression	Total
1	0	0	0	51	5	3	8
2	0	0	1	52	5	3	9
3	0	0	1	53	5	3	9
4	0	0	1	54	6	3	9
5	1	0	1	55	6	3	9
6	1	0	2	56	6	3	9
7	1	0	2	57	6	3	9
8	1	0	2	58	6	3	9
9	1	0	2	59	6	4	9
10	1	1	3	60	6	4	10
11	1	1	3	61	6	4	10
12	2	1	3	62	6	4	10
13	2	1	3	63	6	4	10
14	2	1	3	64	6	4	10
15	2	1	4	65	7	4	10
16	2	1	4	66	7	4	10
17	2	1	4	67	7	4	11
18	2	1	4	68	7	4	11
19	3	1	4	69	7	5	11
20	3	1	5	70	7	5	11
21	3	1	5	71	7	5	11
22	3	1	5	72	7	5	12
23	3	1	5	73	7	5	12
24	3	1	5	74	8	5	12
25	3	1	5	75	8	5	12
26	3	1	5	76	8	5	13
27	3	1	5	77	8	5	13
28	3	1	6	78	8	6	13
29	3	2	6	79	8	6	13
30	3	2	6	80	8	6	14
31	4	2	6	81	8	6	14
32	4	2	6	82	8	6	14
33	4	2	6	83	9	6	14
34	4	2	6	84	9	6	14
35	4	2	6	85	9	6	15
36	4	2	7	86	9	6	15
37	4	2	7	87	10	7	16
38	4	2	7	88	10	7	16
39	4	2	7	89	10	7	16
40	4	2	7	90	10	7	17
41	4	2	7	91	10	7	17
42	4	2	7	92	11	8	17
43	5	2	7	93	11	8	18
44	5	2	8	94	11	8	18
45	5	3	8	95	12	9	19
46	5	3	8	96	13	9	20
47	5	3	8	97	13	10	21
48	5	3	8	98	14	11	23
49	5	3	8	99	15	12	24
50	5	3	8				

Note Where a raw score corresponds to more than one percentile take the higher percentile.