LETTERS TO THE EDITOR

Factor Structure of the General Health Questionnaire in a Sample of Japanese Workers

Key words: Factor analysis—General Health Questionnaire—Japanese workers—Self-rating psychiatric scale

The General Health Questionnaire (GHQ) was principally designed as a test for the screening of non-psychotic psychiatric illness.^{1,2)} The GHQ is one of the more efficient inventories of its type³⁾ and is now the most widely used measurement for surveys of psychiatric epidemiology in the United Kingdom (UK) and other countries. In a comparison between neurotic patients and normal controls, Nakagawa and Daibo⁴⁾ reported that the Japanese version GHQ had good levels of the sensitivity and specificity. The GHQ was also ascertained to correlate well with other indices of the tendencies to neurosis and psychosomatic disease, and to have high internal consistency in Japanese.⁵⁾

Several factor analytic studies on the GHQ have been carried out in other countries.^{6,7)} In Japan, Nakagawa and Daibo⁴⁾ derived 12 factors from the GHQ before eigenvalues fell below 1.0, which explained 53.5% of total variance, and the first 8 factors were interpreted. Their samples consisted of college students, normal adults, and neurotic patients ($n=401$). The factor structure of the GHQ of Japanese workers, however, has not been examined. Therefore, the authors performed a factor analysis of the GHQ.

The subjects were 2,190 workers in a public institution in Hokkaido who were asked to complete the GHQ in September 1986. Complete data were obtained from 2,024 subjects, as shown in Table 1. A principal factor analysis with varimax rotation was used in this study. A squared multiple correlation was

Table 1. Age and sex distribution of subjects examined by the GHQ*

Ages	Males	Females	Total
-19	24 (1.3)	6 (4.4)	30 (1.5)
20-29	412 (21.8)	54 (39.4)	466 (23.0)
30-39	653 (34.6)	19 (13.9)	672 (33.2)
40-49	276 (14.6)	25 (18.2)	301 (14.9)
50-59	494 (26.2)	30 (21.9)	524 (25.9)
60-	8 (0.4)	1 (0.7)	9 (0.4)
unknown	20 (1.1)	2 (1.5)	22 (1.1)
Total	1,887(100.0)	137(100.0)	2,024(100.0)

(): percentage

* : Japanese version GHQ

Table 2. The loadings of the GHQ items on the 5 factors varimax rotated factor pattern

Items	Factors				
	1	2	3	4	5
1 Feeling perfectly well	—	—	.41	—	—
2 In need of tonic	—	—	.37	—	—
3 Run down	—	—	.59	—	—
4 Feeling ill	—	—	.53	—	—
5 Pains in head	—	—	.62	—	—
6 Pressure in head	—	—	.67	—	—
7 Able to concentrate	—	—	.36	—	—
8 Afraid going to collapse	—	—	.37	—	—
9 Hot and cold spells	—	—	.52	—	—
10 Perspiring a lot	—	—	(.34)	—	—
11 Unable to get back to sleep	—	—	—	—	.57
12 Sleep not refreshed you	—	—	.51	—	—
13 Too tired even to eat	—	—	.43	—	—
14 Lost sleep over worry	.39	—	—	—	.48
15 Mentally alert and awake	—	.50	—	—	—
16 Feeling full of energy	—	.56	—	—	—
17 Difficulty getting off	—	—	—	—	.73
18 Difficulty staying asleep	—	—	—	—	.64
19 Frightening/unpleasant dreams	—	—	—	—	.41
20 Restless disturbed nights	—	—	—	—	.56
21 Busy and occupied	—	(.34)	—	—	—
22 Taking longer to do things	.43	—	—	—	—
23 Lose interest in activities	.54	—	.43	—	—
24 Losing interest in person	.49	—	—	—	—
25 Less trouble with clothes	.47	—	—	—	—
26 Getting out as usual	—	(.25)	—	—	—
27 Managing as well as people	—	.36	—	—	—
28 Doing things well	—	.57	—	—	—
29 Late getting to work	.50	—	—	—	—
30 Satisfied with task	—	.49	—	—	—
31 Able to feel warmth	—	.54	—	—	—
32 Easy to get on with others	—	.61	—	—	—
33 Chatting with people	—	.53	—	—	—
34 Afraid to say anything	.54	—	—	—	—
35 Playing useful part	—	.58	—	—	—
36 Making decisions	—	.55	—	—	—
37 Can't make a start	.62	—	—	—	—
38 Dreaming everything	.58	—	—	—	—
39 Constantly under strain	.59	—	—	—	—
40 Can't overcome difficulties	.67	—	—	—	—
41 Finding life a struggle	.40	—	—	—	—
42 Enjoy normal activities	—	.53	—	—	—
43 Been taking things hard	.65	—	—	—	—
44 Edgy and bed-tempered	.54	—	—	—	—
45 Scared and panicky	.49	—	—	.40	—

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46	Able to face up to problems	—	.48	—	—	—
47	Everything on top of you	.67	—	—	—	—
48	People looking at you	.57	—	—	—	—
49	Unhappy and depressed	.67	—	—	—	—
50	Losing confidence yourself	.68	—	—	—	—
51	Thinking yourself worthless	.59	—	—	.40	—
52	Life entirely hopeless	.42	—	—	.62	—
53	Hopeful about own future	—	.50	—	—	—
54	Feeling reasonably happy	—	.52	—	—	—
55	Nervous and strung up	.58	—	—	—	—
56	Life not worth living	—	—	—	.73	—
57	Make away with yourself	—	—	—	.77	—
58	Nerves too bad	—	—	—	.71	—
59	Dead and away from it all	—	—	—	.82	—
60	Idea of taking your life	—	—	—	.79	—
Sum of squares of factor loadings (explained of the variance)		8.429 (14.0)	4.832 (8.1)	4.701 (7.8)	4.494 (7.5)	2.886 (4.8)

Only loadings greater than 0.350 are shown. The parenthesized loadings show the biggest of the item's loadings less than 0.350.

used as the initial communality estimate of an item. Kaiser's measure of sampling adequacy (MSA)⁸⁾ values were of sufficient levels and allowed us to perform factor analysis of our data. The overall MSA value was 0.95 and no item had an MSA value below 0.5, which would be deemed to be unacceptable for factor analysis.⁸⁾

According to the principal factor solution, eigenvalues of the first 6 factors were greater than unity. After varimax rotation, however, the smallest (6th) factor had only 2 significant items, so that it was difficult to interpret. Then the other 5 factors were rotated. They accounted for 42.2% of the total variance. Table 2 indicates varimax rotated factor loadings of the GHQ items. The factors labeled in this study and brief comparisons of factor components with those of other studies are as follows:

Factor 1: General disturbance (22 items with loadings above 0.350. This factor explained 14.0% of total variance). The items included "losing confidence in yourself (item number 50)," "feeling unhappy and depressed (49)," "everything getting on top of you (47)." The items allocated to this factor were related to loss of confidence, anxiety and dysphoria. The items also included "taking things hard (43)" and "can't make a start on anything (37)." They appear to represent a general worsening in the performance of personal and social tasks. This factor contains the 5th factor derived by Goldberg and Hillier,⁶⁾ the 1st and 5th factors and a part of the 4th factor of Worsley *et al.*,⁷⁾ and the 2nd (psychic depression) and 6th (personal neglect) factors of Nakagawa and Daibo.⁴⁾

Factor 2: Social dysfunction (14 items, 8.1%). There were high loadings on items such as "finding it easy to get on with other people (32)," "you are

playing a useful part in things (35),” and “you were doing things well (28).” This factor contains the 4th factor of Goldberg and Hillier,⁶⁾ the 7th factor and a part of the 1st and 6th factors of Worsley *et al.*,⁷⁾ and the 1st (general psychiatric ill-health) and 7th (desire for interpersonal relations) factors of Nakagawa and Daibo.⁴⁾

Factor 3: Somatic complaints (12 items, 7.8%). The items included “getting tightness or pressure in head (6),” “getting any pains in head (5),” and “feeling run down and out of sorts (3).” This factor contains the 1st and 2nd factors of Goldberg and Hillier,⁶⁾ the 6th and 8th factors and a part of the 4th factor of Worsley *et al.*,⁷⁾ and the 5th (anxiety about physical states) and 8th (headache) factors of Nakagawa and Daibo.⁴⁾

Factor 4: Suicidal thoughts (8 items, 7.5%). There were high loadings on items such as “wishing you were dead and away from it (59),” “taking your own life (60),” and “thought of making away with yourself (57).” The items allocated to this factor correspond to those of the 6th factor of Goldberg and Hillier,⁶⁾ the 2nd factor of Worsley *et al.*,⁷⁾ and the 3rd (suicidal thoughts) factor of Nakagawa and Daibo.⁴⁾

Factor 5: Sleep disturbance (6 items, 4.8%). The items included “difficulty in getting off to sleep (17),” “difficulty in staying asleep (18),” and “waking early and unable to get back to sleep (11).” These 6 items coincide with the items of the 3rd factor of both Goldberg and Hillier⁶⁾ and Worsley *et al.*,⁷⁾ and the 4th (sleep disturbance) factor of Nakagawa and Daibo.⁴⁾

Table 3. Comparisons of factor structures derived from the 60-items GHQ

Worsley et al ('78)	Goldberg & Hillier ('79)	The present study
Australia females, gynecological clinic attenders	United Kingdom both sexes GP attenders	Japan both sexes public officials
Poor performance	General illness	General disturbance
Depression-anxiety	Somatic symptoms	Social dysfunction
Sleep disturbance	Sleep disturbance	Somatic complaints
Anhedonia-anergia	Social dysfunction	Suicidal thoughts
Loss of confidence	Anxiety & dysphoria	Sleep disturbance
General illness	Suicidal depression	
Social dysfunction		
Headache		
Total explained variance: 59.8%	53.5%	42.2%

The column headings indicate the author, country, and nature of the sample for each study in order. Names of the derived factors appear below each column heading. Total variances accounted for by each analysis are shown at the bottom of the table.

Worsley *et al.* and the present authors used a principal factor analysis, while Goldberg and Hillier used a principal axes analysis. All of these analyses were varimax rotated.

Table 3 compares the present factor structure with those of the other studies.^{6,7)} Marked differences were found in the number of factors. Since the present factor structure was composed of fewer factors, each extracted factor seems to be more comprehensive than those of the other studies, though the explained total variance of derived factors in this study was smaller than those of Worsley *et al.*⁷⁾ and Nakagawa and Daibo.⁴⁾ The present factor structure was to a large degree consistent with that of Goldberg and Hillier,⁶⁾ though a comparison of total explained variance with their study cannot be carried out because it used a different analytic method, a principal axes analysis.

The sleep disturbance factor and the suicidal thoughts factor were derived from other studies.^{4,6)} Thus, these factors seem to be stable across samples, at least between a UK population and Japanese. About 93% of the subjects were males; this caused us to limit our study for sex difference. Further research is needed based on a more representative sample of Japanese.

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