

Screening for Psychological Distress in Japanese Cancer Patients

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Background: Psychological distress is frequently observed, however, it is underestimated in cancer patients. The aim of this study is to develop a simple battery for screening for psychological distress, adjustment disorder and major depressive disorder in Japanese cancer patients.

Methods: One hundred and twenty-eight cancer patients were interviewed by psychiatrists and tested using the Hospital Anxiety and Depression Scale (HADS), a 14-item self-assessment questionnaire. Psychiatric diagnoses were performed according to the Diagnostic and Statistical Manual of Mental Disorders, third edition-revised.

Results: Cronbach α values of the Japanese version of the scale were 0.77 for the subscale for anxiety and 0.79 for depression. By a receiver operating characteristic analysis, we determined that an optimal cut-off point for screening for adjustment disorder and major depressive disorder was 10/11, which gave high enough sensitivity and specificity (91.5 and 65.4%, respectively). To screen for major depressive disorder alone, 19/20 was an optimal cut-off point with 82.4% sensitivity and 96.3% specificity. The subscales of HADS (anxiety and depression) also had high screening performance.

Conclusions: The Japanese version of HADS is a sensitive and specific tool for screening for psychological distress in Japanese cancer patients. This scale can be used for an early detection of patients' psychological distress which may be followed by psychiatric interventions.

Key words: screening – anxiety – depression – psycho-oncology

INTRODUCTION

Cancer patients must face several stresses, and factors which cause their psychological distress, especially anxiety and depression. Previous reports indicated that the most frequent psychiatric diagnoses of cancer patients were adjustment disorder with anxiety and/or depression and they also suffered from major depressive disorder (1).

Although patients with these psychiatric diagnoses need to take specific psychiatric therapies, including medication, they tend to be over- or underdiagnosed by medical staff (2,3). One reason for this tendency is that medical staff, even the family, take it for granted that cancer patients have some psychological distress so that it is not worthwhile taking psychiatric interventions (4), and

the other is a difficulty in assessing their distress because of the physical symptoms (5,6). However, this psychological distress can disturb the patient's quality of life and affect their choice of treatments for cancer.

Some screening batteries have been developed for the early detection of patients' psychological distress (7,8). The Hospital Anxiety and Depression Scale (HADS; refer to the Appendix), a self-report questionnaire, was developed by Zigmond and Snaith (9) and is well accepted to screen for psychiatric problems in medically ill patients because it has only 14 items and does not include questions about physical symptoms (10,11).

In the present study, we investigated the reliability and the validity of the Japanese version of HADS, and its usefulness to screen for psychological distress in Japanese cancer patients.

MATERIALS AND METHODS

Between August 1996 and April 1997, 128 cancer patients were interviewed by three trained psychiatrists (AK, TA, YU) according to the Structured Clinical Interview for the Diagnostic and Statistical Manual of Mental Disorders, third edition-revised (SCID) and simultaneously filled out HADS after the interview at the National Cancer Center Hospital East. These patients had been selected in two ways. There were 31 who had been referred by oncologists to the psychiatrists and diagnosed as adjustment

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Abbreviations: HADS, Hospital Anxiety and Depression Scale; SCID, the Structured Clinical Interview for the Diagnostic and Statistical Manual of Mental Disorders, third edition-revised; POMS, the Profile of Mood States; ROC, receiver operating characteristic; GFI, Goodness of Fit Index; PPV, positive predictive value

disorder or major depressive disorder (including eight ambulatory patients). The diagnosis of adjustment disorder is defined as emotional or behavioral disturbances in response to an identifiable stressor (e.g. diagnosis of cancer) which cause a significant impairment in social or occupational functioning. On the other hand, major depressive disorder is thought to be a more severe disorder and is defined as at least two weeks of depressed mood or loss of interest accompanied by at least four of the following symptoms: 1. decrease in appetite, or weight loss; 2. sleep disturbance; 3. psychomotor retardation or agitation; 4. fatigue or loss of energy; 5. feeling of worthlessness; 6. diminished ability to think or concentrate; 7. suicidal ideation. The other subjects were 55 advanced lung cancer patients and 42 head and neck cancer patients who were newly admitted to the hospital and waiting for treatment (mainly surgery or chemotherapy). They were sampled consecutively, and the patients with cognitive impairment or severe physical dysfunction were excluded. Those patients gave written informed consent.

Ninety-seven of the newly admitted patients also filled out the Profile of Mood States (POMS) as an external standard. Test-retest reliability of HADS was examined in 109 ambulatory breast cancer patients who also gave written informed consent.

This study was approved by the Institutional Review Board of the National Cancer Center.

SCALES

HADS

The HADS is a four-point, 14-item self-assessment scale to measure psychological distress, and has two factors: anxiety and depression. The Japanese version of HADS was backtranslated by Kitamura (12).

POMS

POMS is known as a useful measurement of mood in cancer patients and consists of six factors: Tension-Anxiety, Depression-Dejection, Anger-Hostility, Vigor, Fatigue, and Confusion (13). The validation study of the Japanese version of POMS was reported by Yokoyama et al. (14).

STATISTICAL ANALYSIS

In order to test the specificity and sensitivity of HADS, receiver operating characteristic (ROC) analysis was performed twice: once for assessing its validity as a method of screening for adjustment disorder and major depressive disorder taken together, and once for screening for major depressive disorder alone, excluding adjustment disorder.

Representing ROC analysis on a curve is a way of expressing the relationship between the true positive rate (sensitivity) and the false-positive rate ($1 - \text{specificity}$). The curve is a representation of the ability of the screening instrument to discriminate between 'cases' and 'non-cases'. The desired cut-off point is generally chosen in order to minimize the sum of false-positive and false-negative test results.

The other analyses described in the article were conducted using SAS statistical software.

RESULTS

PATIENT CHARACTERISTICS

Table 1 shows the patients' sociodemographic and medical data. The mean age of the subjects was 61.1 ± 10.8 (SD) years (52–91 years, median 61), and 62.5% of the subjects were male. The cancer sites were mainly lung and head and neck. Most of the subjects were married and 41.4% had a full-time job. As to phase of illness in hospitalized patients ($n = 120$), 85.0% were waiting for the initial treatment, and the others were post operation (10.0%) or during chemotherapy or radiation (3.3%). Two were in terminal phase. The median performance status (the Eastern Cooperative Oncology Group's Scale) was one. The referred patients were significantly younger (mean age 54.7 vs 63.1, $t = 3.98$; d.f. = 126; $p < 0.001$), consisted of higher percentages of females (61.3% vs 29.9%, $\chi^2 = 10.4$; d.f. = 1; $p < 0.01$), and had poorer performance status (mean 1.32 vs 0.58, $z = 2.72$; $p < 0.01$).

Table 1. Patients' characteristics ($n = 128$)

Item	Category	<i>n</i>	%
Age (years)	<50	16	12.5
	50–59	41	32.0
	60–69	43	33.6
	≥70	28	21.9
Sex	Male	80	62.5
	Female	48	37.5
Education (years)	≤9	54	42.2
	≥10	70	54.7
	Unknown	4	3.1
	Employment status	Full-time	53
	Part-time	6	4.7
	Housewife	24	18.8
	Retired	27	21.1
	Unemployed	5	3.9
	Other	13	10.1
Marital status	Married	113	88.3
	Unmarried	4	3.1
	Divorced	5	3.9
	Separated	6	4.7
Cancer site	Lung	60	46.9
	Head and neck	53	41.4
	Digestive	8	6.3
	Breast	4	3.1
	Malignant lymphoma	3	2.3
Performance status (ECOG)	0	55	43.0
	1	60	46.9
	2	7	5.5
	3	2	1.5
	4	4	3.1

ECOG, the Eastern Cooperative Oncology Group.

Table 2. Sensitivity and specificity for the optimal cut-off points for screening for adjustment disorder and major depressive disorder or major depressive disorder alone using total score or subscales of HADS

	Adjustment disorder and major depressive disorder			Major depressive disorder		
	Cut-off point	Sensitivity	Specificity	Cut-off point	Sensitivity	Specificity
HADS total	10/11	91.5	65.4	19/20	82.4	96.3
HADS anxiety	7/8	74.5	87.7	7/8	94.1	87.7
HADS depression	4/5	91.5	58.0	10/11	82.4	95.1

HADS, the Hospital Anxiety and Depression Scale.

RELIABILITY AND VALIDITY OF THE JAPANESE VERSION OF HADS

Cronbach's α of the Japanese version of HADS was 0.77 for the anxiety subscale and 0.79 for the depression subscale. The correlations of the scores between test and retest were 0.82 for the total score of HADS, 0.73 for the anxiety subscale, and 0.82 for the depression subscale ($p = 0.0001$; Pearson correlation test). The mean interval between test and retest was 7.9 days (4–23 days). The correlation between the total scores of HADS and that of POMS, between the anxiety scores of HADS and the Tension-Anxiety scores of POMS, and between the depression scores of HADS and the Depression-Dejection scores of POMS were 0.60, 0.60 and 0.49, respectively ($p = 0.0001$; Pearson correlation test). The results of confirmatory factor analyses were as follows: Goodness of Fit Index (GFI), 0.90; GFI adjusted for degrees of freedom, 0.86; root mean square residual, 0.057; $\chi^2 = 97.1$; and probability based on a $\chi^2 > 0.05$.

SCREENING FOR PSYCHOLOGICAL DISTRESS BY HADS

Thirty (23.4%) of 128 patients were diagnosed as adjustment disorder and 17 (13.3%) were major depressive disorder. The mean HADS score for the patients without adjustment disorder or major depressive disorder was 8.7, for the patients with adjustment disorder 18.0, and for the patients with major depressive disorder 23.5.

Figure 1 shows the ROC curve for screening for adjustment disorder and major depressive disorder expressing the relationship between the true positive rate (sensitivity) and the false-positive rate (1 – specificity) for each of the total scores of HADS. The ROC curve for screening for major depressive disorder alone is shown in Fig. 2. The optimal cut-off point for the screening of adjustment disorder and major depressive disorder seems to be 10/11. This cut-off point is associated with 91.5% sensitivity and 65.4% specificity. The optimal cut-off point for the screening of major depressive disorder seems to be 19/20, which gave 82.4% sensitivity and 96.3% specificity (Table 2).

For the screening of adjustment disorder and major depressive disorder, the probability of a high HADS score of 15 being associated with a case [the positive predictive value (PPV)] is 72.3%, and the PPV of a low score of four is 41.6%. For the screening of major depressive disorder taken alone, the PPV of a high score of 26 is 92.3% and that of a low score of 12 is 61.2%.

The HADS anxiety and depression subscales were also tested and optimal cut-off points determined for screening for adjust-

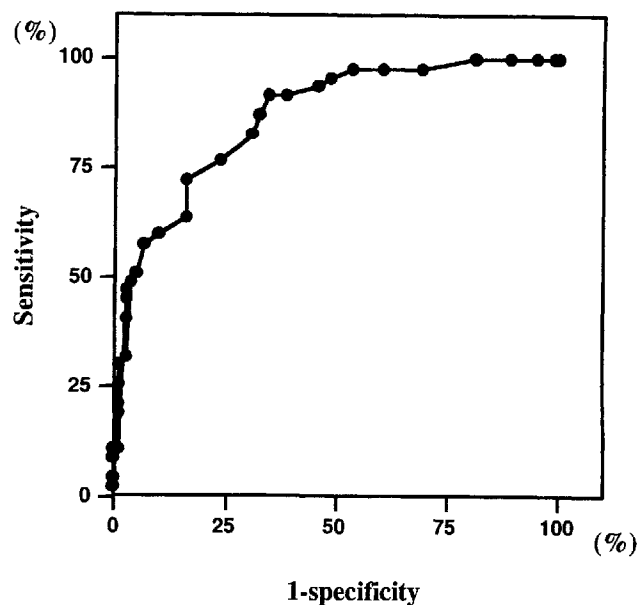


Figure 1. ROC curve for screening for adjustment disorder and major depressive disorder using HADS. Sensitivity and 1 – specificity to screen for adjustment disorder and major depressive disorder were plotted for each value of HADS. HADS, the Hospital Anxiety and Depression Scale; ROC, receiver operating characteristics.

ment disorder and major depressive disorder or major depressive disorder alone (Table 2). These subscales, except the depression subscale for screening for adjustment disorder and major depressive disorder (specificity 58.0%), provided high sensitivity and specificity.

DISCUSSION

The present results indicated that the Japanese version of HADS had well-accepted reliability and validity, and the scale was a useful screening battery for screening for psychological distress in cancer patients. Sensitivity and specificity for the optimal cut-off points were high enough compared with the previous reports (7,8,10,15,16–18).

HADS was developed by Zigmond and Snaith in 1983 (9) and widely used as an instrument for detecting states of anxiety and depression in a healthy population (19), psychiatric patients (20), or medically ill patients (21,22) such as those with stroke (23) and rheumatoid arthritis (24). Most studies indicated its validity and

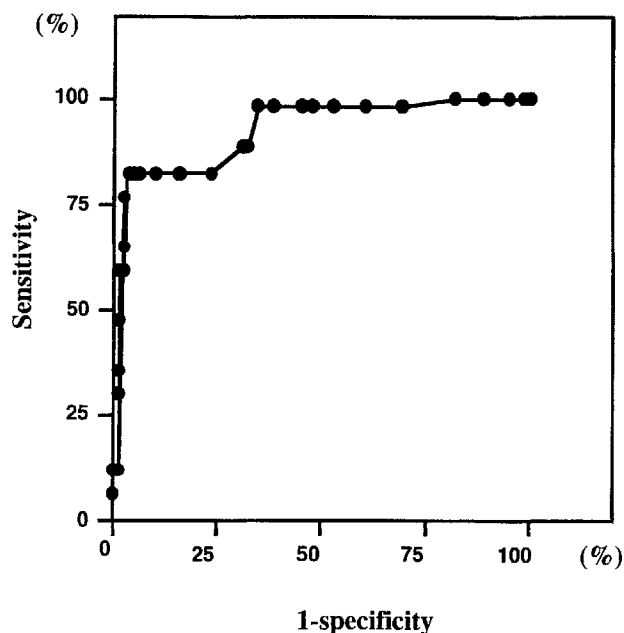


Figure 2. ROC curve for screening for major depressive disorder using HADS. Sensitivity and 1 – specificity to screen for major depressive disorder alone were plotted for each value of HADS. HADS, the Hospital Anxiety and Depression Scale; ROC, receiver operating characteristics.

usefulness as a screening battery, and our results confirmed that the Japanese version of the scale is also well accepted.

Cancer patients whose psychological distress is mainly characterized by anxiety and depression can benefit from using HADS to detect this distress. Carrol et al. (17) tested 809 cancer patients using HADS and reported that 23.1% of them had scores of 11 or greater for the anxiety or depression scale, and appeared to have anxiety or depressive disorders. The distress of Japanese cancer patients measured by HADS as well as POMS was obviously higher in the subjects who were diagnosed as adjustment disorder or major depressive disorder; however, we could not say that the prevalence of distress or scores of these scales were high or not by this study. In Carrol's report, clinical psychiatric interviews were not performed. Ibbotson et al. (7) used HADS as a screening battery and interviewed simultaneously. They determined an optimal cut-off point of HADS as 14/15 to screen for psychiatric problems in 284 cancer patients. Razavi et al. (10) tested HADS in 210 cancer in-patients with variable sites and performed psychiatric diagnosis simultaneously. The design and sampling of the study were similar to those of our study. Their result indicated that optimal cut-off points were 12/13 or 18/19 for screening for adjustment disorder and major depression or major depression alone, respectively. The cut-off point which we suggested (10/11) was lower than in these reports. The optimal cut-off point gave high sensitivity (91.5%), and the false-positive rate was 34.6%. Razavi et al. (10) indicated the possibility of a false-positive rate caused by the frequency of acute stress reactions, which may give rise to a high level of psychological distress and thus high scores on HADS. The

false-positive rate of our study may be associated with the patient's subclinical high distress in Japanese cancer patients.

We can choose 14/15 as a cut-off point if we need higher specificity, resulting in 76.5% (76.6% sensitivity) in our samples, which is superior to that of Razavi's report. Which cut-off points we should select depends on the purpose of using HADS. The anxiety subscale of HADS also gave high sensitivity and specificity at the cut-off point 7/8. This result supports the previous report indicating the usefulness of the separate subscales of HADS as a screening battery (11). However, the anxiety subscale gave the same cut-off point for major depressive disorder as for adjustment disorder and major depressive disorder, indicating the difficulties in distinguishing this type of psychological distress by the subscale.

The limitation of our study is that the subjects consisted of two different groups. Ibbotson et al. (7) suggested that HADS had a good screening performance, especially for those free of disease and when the disease was judged to be more stable than in those with progressive disease, and concluded that we should take disease and treatment status into account. Furthermore, the previous studies suggested that we need to investigate the screening performance of the scale in the setting of site-specific malignancies (8,15). Future research in a specific setting will provide us with more specific cut-off points.

In conclusion, this is the first report that proved the reliability and validity of the Japanese version of HADS, and the scale appeared to be a simple, sensitive and specific battery for screening for psychological distress in Japanese cancer patients. For the early detection in general cancer patients of adjustment disorder and major depressive disorder for which we should consider psychiatric interventions or careful observations of the patient, an optimal cut-off point of HADS of 10/11 is recommended. Further research that we investigates the screening property of the scale in a more specific setting will be required.

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References

1. Derogatis LR, Morrow GR, Fetting J, Penman S, Piasetsky AM, Schmale M, et al. The prevalence of psychiatric disorders among cancer patients. *J Am Med Assoc* 1983;249:751–7.
2. Massie MJ, Holland JC. Depression and the cancer patient. *J Clin Psychiatry* 1990;51:12–17.
3. McDaniel JS, Musselman DL, Porter MR, Reed DA, Nemeroff CB. Depression in patients with cancer. *Arch Gen Psychiatry* 1995;52:89–99.

4. Breitbart W, Jacobsen PB. Psychiatric symptom management in terminal care. *Clin Geriatr Med* 1996;12:329-47.
5. Cavanaugh S, Clark DC, Gibbons RD. Diagnosing depression in the hospitalized medically ill. *Psychosomatics* 1983;24:809-15.
6. Kathol RG, Murgi A, Williams J, Clamon G, Noyes R Jr. Diagnosis of major depression in cancer patients according to four sets of criteria. *Am J Psychiatry* 1990;147:1021-4.
7. Ibbotson T, Maguire P, Selby P, Priestman T, Wallace L. Screening for anxiety and depression in cancer patients: the effects of disease and treatment. *Eur J Cancer* 1994;30A:37-40.
8. Hopwood P, Howell A, Maguire P. Screening for psychiatric morbidity in patients with advanced cancer of the breast: validation of two self-rating questionnaires. *Br J Cancer* 1991;64:353-6.
9. Zigmond AS, Snaith RP. The Hospital and Depression Scale. *Acta Psychiatrica Scand* 1983;67:361-70.
10. Razavi D, Delvaux N, Farvacques C, Robaye E. Screening for adjustment disorders and major depressive disorders in cancer in-patients. *Br J Psychiatry* 1990;156:79-83.
11. Mooney S, Greer S, Watson M, Gorman C, Rowden L, Tunmore R. The factor structure and factor stability of the Hospital Anxiety and Depression Scale in patients with cancer. *Br J Psychiatry* 1991;158:255-9.
12. Kitamura T. Hospital Anxiety and Depression Scale. *Seisinka Sindangaku* 1993;4:371-2 (in Japanese).
13. Cella DF, Orofiamma B, Holland JC, Silberfarb PM, Tross S, Feldstein M, et al. The relationship of psychological distress, extent of disease, and performance status in patients with lung cancer. *Cancer* 1987;60:1661-7.
14. Yokoyama K, Araki S, Kawakami N, Takeshita T. Production of the Japanese edition of profile of mood status (POMS): assessment of reliability and validity. *Nippon Koshuueiseigaku Zasshi* 1990;37:913-18 (in Japanese).
15. Razavi D, Delvaux N, Bredart A, Paesmans M, Debusscher L, Bron D. Screening for psychiatric disorders in lymphoma out-patients. *Eur J Cancer* 1992;28A:1869-72.
16. Hopwood P, Howell A, Maguire P. Psychiatric morbidity in patients with advanced cancer of the breast: prevalence measured by two self-rating questionnaires. *Br J Cancer* 1991;64:349-52.
17. Carol B, Kathol R, Noyes R, Wald T, Clamon GH. Screening for depression and anxiety in cancer patients using the Hospital Anxiety and Depression Scale. *Gen Hosp Psychiatry* 1993;15:69-74.
18. Chaturvedi SK, Shenoy A, Prasad KMR, Senthilnathan, SM, Premalatha BS. Concerns, coping and quality of life in head and neck cancer patients. *Support Care Cancer* 1996;4:186-90.
19. Spinhoven PH, Ormel J, Sloekers PPA, Kempen GJJ, Speckens AEM, van Hemert AM. A validation study of the Hospital Anxiety and Depression Scale (HADS) in different groups of Dutch subjects. *Psychol Med* 1997;27:363-70.
20. Malasi TH, Mirza IA, El-Islam MF. Validation of the Hospital Anxiety and Depression Scale in Arab patients. *Acta Psychiatrica Scand* 1991;84:323-6.
21. Aylard PR, Gooding JH, McKenna PJ, Snaith RP. A validation study of three anxiety and depression self-assessment scales. *J Psychosom Res* 1987;31:261-8.
22. Abiodun OA. A validity study of the Hospital Anxiety and Depression Scale in general hospital units and a community sample in Nigeria. *Br J Psychiatry* 1994;165:669-72.
23. Johnson G, Burvill PW, Anderson CS, Jamrozik K, Stewart-Wynne EG, Chakera TMH. Screening instruments for depression and anxiety following stroke: experience in the Perth community stroke study. *Acta Psychiatr Scand* 1995;91:252-7.
24. Chandarana PC, Eals M, Steingart AB, Steingart AB, Bellamy N, Allen S. The detection of psychiatric morbidity and associated factors in patients with rheumatoid arthritis. *Can J Psychiatry* 1987;32:356-61.

APPENDIX

A. THE HOSPITAL ANXIETY AND DEPRESSION SCALE (HADS)

Read each item and please circle the answer which comes closest to how you have been feeling, on the average, in the past week. Don't take too long over your answers; your immediate reaction to each item will probably be more accurate than a long thought out response.

1. I feel tense or 'wound up':
 - a. Most of the time
 - b. A lot of the time
 - c. From time to time, occasionally
 - d. Not at all
2. I still enjoy the things I used to enjoy:
 - a. Definitely as much
 - b. Not quite so much
 - c. Only a little
 - d. Hardly at all
3. I get a sort of frightened feeling as if something awful is about to happen:
 - a. Very definitely and quite badly
 - b. Yes, but not too badly
 - c. A little, but it doesn't worry me
 - d. Not at all
4. I can laugh and see the funny side of things:
 - a. As much as I always could
 - b. Not quite so much now
 - c. Definitely not so much now
 - d. Not at all
5. Worrying thoughts go through my mind:
 - a. A great deal of the time
 - b. A lot of the time
 - c. From time to time but not too often
 - d. Only occasionally
6. I feel cheerful:
 - a. Not at all
 - b. Not often
 - c. Sometimes
 - d. Most of the time
7. I can sit at ease and feel relaxed:
 - a. Definitely
 - b. Usually
 - c. Not often
 - d. Not at all
8. I feel as if I am slowed down:
 - a. Nearly all the time
 - b. Very often
 - c. Sometimes
 - d. Not at all
9. I get a sort of frightened feeling like 'butterflies' in the stomach:
 - a. Not at all
 - b. Occasionally
 - c. Quite often
 - d. Very often
10. I have lost interest in my appearance:
 - a. Definitely
 - b. I don't take as much care as I should

- c. I may not take quite as much care
 - d. I take just as much care as ever
11. I feel restless as if I have to be on the move:
- a. Very much indeed
 - b. Quite a lot
 - c. Not very much
 - d. Not at all
12. I look forward with enjoyment to things:
- a. As much as ever I did
 - b. Rather less than I used to
 - c. Definitely less than I used to
 - d. Hardly at all
13. I get sudden feelings of panic:
- a. Very often indeed
 - b. Quite often
 - c. Not very often
 - d. Not at all

14. I can enjoy a good book or radio or TV program:
- a. Often
 - b. Sometimes
 - c. Not often
 - d. Very seldom

B. CALCULATION OF HADS

Each item is scored 0–3 (items 1, 3, 5, 6, 8, 10, 11, 13 are reversely scored). The maximum score of this scale is 42. The odd-numbered items indicate anxiety subscales, and the even-numbered items depression subscales.

C. THE JAPANESE VERSION OF HADS

The copyright of the Japanese version of HADS belongs to Dr Kitamura, and you can refer to the full scale of this version in reference 12 (the original reference is 9).