ALCOHOL-USE DISORDERS IDENTIFICATION TEST: A COMPARISON BETWEEN PAPER AND PENCIL AND COMPUTERIZED VERSIONS

E. CHAN-PENSLEY

Melbury Lodge, Royal Hampshire County Hospital, Romsey Road, Winchester, Hants SO22 5DG, UK

Abstract — The use of screening questionnaires to detect early problem drinking has been stimulated by the development of the AUDIT (Alcohol-Use Disorders Identification Test). A comparison of a computerized version of the test and its paper and pencil original was conducted on 110 consecutive attenders at an alcoholism day-treatment facility. The findings suggest that the computer version is as acceptable as the paper and pencil one and that scores on the two formats are comparable.

INTRODUCTION

The potential benefits of computers in psychiatry have been explored widely. They have been used as diagnostic aids, decision support systems, and for self-rating in areas such as depression and suicide potential (Griest *et al.*, 1973; Carr *et al.*, 1981). In the area of substance misuse, they have been found to eliminate observer bias and to enhance the therapeutic relationship with patients, and it has been suggested that patients might be more likely to admit to socially deviant behaviour to a computer (Mizutani and Fassler, 1985; Anderson and Min, 1987; Levine *et al.*, 1989).

There has been long-standing interest in screening for risky drinking and the detection of alcohol abuse. The failure of chemical/biological markers to outperform clinical interviewing has been an additional incentive to develop simple/short instruments which might be used for screening purposes.

The AUDIT (Alcohol-Use Disorders Identification Test) screening tool was developed by the WHO in 1989 to be used as a means of identifying those drinkers who are engaged in hazardous drinking, with a view to early intervention (Babor *et al.*, 1989). AUDIT is a 10-item questionnaire. The scale allows the assessment of hazardous use and dependence and harmful use in the terminology of the WHO, as set out in ICD-10 (World Health Organization, 1992). The standard cut-off point of 8 provides good sensitivity and specificity for the detection of social and medical problems related to alcohol (Conigrave *et al.*, 1995*a,b*).

The test has been used across cultures and was initially incorporated as part of a wider health interview. It has, however, also been utilized as a screening instrument across a wide range of health settings and demonstrated to be a reliable and valid means of detecting hazardous and harmful consumption (Claussen and Aasland, 1993; Sharkey *et al.*, 1996; Allen *et al.*, 1997; Piccinelli *et al.*, 1997; Bradley *et al.*, 1998). Additionally, it possesses the qualities of brevity, ease of administration, a rich multinational database and an absence of copyright fee (Allen *et al.*, 1997). Other advantages include the detection of problem drinkers at the less severe end of the spectrum and the reduction of under-reporting due to its frequency-based format. As a result of these numerous benefits, it was considered that the wider adoption of the test might be facilitated if a valid computerized version of the test was available.

In the present work, the computerized format of AUDIT was compared with the paper and pencil version.

METHODS

One hundred and ten consecutive admissions to the day-hospital programme of the Alcohol Advisory Service were asked to complete the AUDIT questionnaire as part of their routine assessment.

Patients

Attendees underwent a routine clinical interview of approximately 1 h prior to attendance. This

included assessment of details of their drinking histories. All patients, with one exception, met the ICD-10 criteria for alcohol abuse or alcohol dependence. The patient who failed to meet either of these criteria had fulfilled the criteria 18 months prior to the study when he had completed a programme of treatment. His attendance was in order to participate in a 'refresher' relapse prevention course. He was abstinent at the time of his attendance.

The sample consisted of 67 men and 43 women. Age ranged from 18 to 71 years with a mean ± SD of 43.06 ± 10.61 years. Duration of problem drinking ranged from 1 to 37 years with a mean of 10.56 ± 8.67 years. Sixty patients required detoxification, whilst a further six commenced attendance after detoxification elsewhere. The daily alcohol consumption ranged from 5 to 60 U daily with a mean of 26.17 ± 11.81 U (1 U = 10 g of pure alcohol).

Assessments

Those patients who were admitted for detoxification were not expected to complete the ratings on their first day of attendance, because of the possible confounding effects of intoxication. A counter-balanced design was chosen with patients alternating between the paper and the computer versions of the questionnaire. Both versions were completed by all patients over 2 days. Patients were also asked to rate the ease of completion, comprehensibility, and degree of intimidation of the computer version, as compared to its paper counterpart, as well as to the acceptability of using a computer to enquire about their drinking habits. The form also included the opportunity for patients to record any other comments. The computerized version presented the user with his/her score at the end of the test and indicated whether the score fell into the safe or hazardous range of drinking. The program used ran under the MS-DOS operating system. This decision was taken, so that the software might run on a low specification machine. A copy is available from the author.

RESULTS

Of the patients approached, only one refused to participate in the assessment process. Participating patients were able to complete both questionnaires and no spoilt papers were returned.

Table 1. Scores per category

| Format | n | Scores | | | Significance (P) |
		Total	Mean	SD	
Paper	110	3269	29.72	6.51	0.47
Computer	110	3294	29.95	6.72	

Table 2. Scores by order of presentation

| Format | n | Scores | | | Significance (P) |
		Total	Mean	SD	
Computer first					
Paper	55	1573	28.6	6.90	0.39
Computer	55	1592	28.95	6.84	
Paper first					
Computer	55	1702	30.95	6.46	0.82
Paper	55	1696	30.84	5.83	

Analysis of the total test scores, irrespective of order of presentation, revealed mean (±SD) values of 29.72 ± 6.51 for the paper version and 29.95 ± 6.72 for the computer version, with a probability of 0.42 (two-tailed test) (Table 1). All patients with the exception of the abstinent patient scored in excess of 8 on both versions of the test.

When the results were analysed according to order of presentation, with paper version first, the mean values for the paper version were 30.84 ± 5.83 and for the computer version 30.95 ± 6.46 with a probability of 0.82 (Table 2).

Examination of the results when the computer version was administered first yielded means of 28.60 ± 6.90 for paper and 28.95 ± 6.84 for computer, with a probability of 0.39 (Table 2).

Analysis of patient reaction to the use of computers to enquire about their drinking revealed that the majority of patients were unperturbed about supplying details of their drinking to a computer, with only seven patients reporting this as being unacceptable or very unacceptable (Table 3).

While the majority of patients found the computer easy to use and to understand, 10 patients found the computer version more difficult to understand, eight found it more difficult to complete, while 13 patients found the computer version more intimidating than its paper counterpart (Table 4).

Eighteen patients made written comments upon the tests. Two respondents suggested that additional

Table 3. Responses to question on acceptability of using a computer to enquire about drinking habits

Response	n
Very unacceptable	2
Unacceptable	5
No feelings either way	28
Acceptable	38
Very acceptable	37
Total	110

Table 4. Responses to questions on comprehensibility, ease of completion, and degree of intimidation of computer compared to paper equivalent

Response	n
Comprehensibility	
More difficult to understand	10
No different	66
Easier to understand	34
Ease of completion	
More difficult to complete	9
No different	55
Easier to complete	46
Degree of intimidation	
More intimidating	13
No different	64
Less intimidating	33

instruction on computer operation was desirable; five made positive comments on the computer version; six amplified their test answers; three complained of ambiguity of test items, one of whom also expressed concerns over test results being made accessible to outside agencies; one gave advice for updating the technology and one made responses not directly related to the study.

A small number of patients (seven), were taken aback by the computer assessment that their drinking was hazardous. The therapists found this surprising since it had been assumed that these patients must, at some level, have acknowledged a problem with their drinking by their attendance at a treatment facility. As this was an unexpected finding, no attempt was made to monitor or elicit systematically such reactions during the study.

The post-study discussion revealed that a small number of patients (nine), who had been particularly anxious about using computers, derived a sense of increased esteem when they succeeded in completing the computerized version, despite their

earlier misgivings. The more general problems of poor vision and language difficulties (encountered by only two patients) applied equally to both the computer and its paper equivalent.

DISCUSSION

As previous studies have demonstrated AUDIT's ability to differentiate alcoholics from non-alcoholics (Bohn *et al.*, 1995), no attempt was made to determine whether patient's admitted level of consumption or the presence/absence of a dependence syndrome correlated with their test scores. It is nevertheless reassuring that no patient, excluding the abstinent patient, scored less than 8, the recommended threshold for detecting hazardous/harmful drinking, while only two patients (computer version), scored less than 10. This figure had been suggested by Bohn *et al.* (1995) as the cut-off score for separating alcoholics in treatment from non-alcoholics.

With regard to the principal aim of the study, the results suggest that the computer version is as accurate as the paper version from which it is derived. The means of the two versions demonstrated no significant statistical difference either when total scores were compared or when the analysis was undertaken by order of presentation.

No support for the assertion that patients are more candid in their responses to a computer was found. This might be explained by the fact that all participants were already identified as being problem drinkers and were therefore equally honest in their responses on both tests.

The results are not dissimilar to those of Davis and Morse (1991) utilizing a self-administered alcoholism screening test of 37 items based on the Michigan Alcoholism Screening Test (MAST). Their findings revealed considerable agreement between a computer-administered version of the test and a paper and pencil version. Analagous results were found for the CAGE and Short Michigan Alcoholism Screening Test, where no significant differences in sensitivies and specificities of the tests were found (Barry and Flemming, 1990)

Our experience is that many patients find using the computerized version acceptable. A potential explanation may be the instantaneous feedback given by the computer. This may be an advantage in the context of increasing motivation, as the

provision of non-confrontational feedback is considered a potent component of brief intervention for alcohol-related problems (Bien *et al.*, 1993). A further advantage is that the computer ensures that all questions are completed, which may not be the case in paper and pencil versions of self-rating (Arfwidsson *et al.*, 1974).

In terms of the general acceptability of a computerized format, no objections were raised by patients regarding the restricted choices offered by the computer, despite the fact that a few patients expanded their responses on the paper version.

A limitation of the results may be that of non-applicability to other populations of drinkers, as the study was conducted with attendees at an alcoholism-treatment facility, and it is important to bear in mind that a small minority (seven in this study) considered the use of computers to enquire about drinking habits unacceptable. Benefits on esteem relied upon staff impressions, rather than on systematic assessment; caution must therefore be exercised in interpreting this latter finding. In conclusion, our study suggests that the computerized version of AUDIT is an acceptable alternative to its paper equivalent and that, for the majority of patients, it is neither more difficult to comprehend nor to complete.

REFERENCES

Allen, J. P., Litten, R. Z., Fertig, J. B. and Babor, T. (1997) A review of research on the Alcohol-Use Disorders Identification Test. *Alcoholism: Clinical and Experimental Research* **21**, 613–619.

Anderson, R. V. and Min, D. (1987) Computerization of chemical dependency. *Minnesota Medicine* **70**, 697–699.

Arfwidsson, L., d'Elia, G., Laurell, B., Ottosson, J. O., Perris, C. and Persson, G. (1974) Can a self-rating replace a doctor's rating in evaluating antidepressive treatment? *Acta Psychiatrica Scandinavica* **50**, 16–22.

Babor, T. F., de la Fuente, J. R., Saunders, J. and Grant, M. (1989) *AUDIT — the Alcohol-Use Disorders Identification Test: Guidelines for Use in Primary Health Care.* World Health Organization, Division of Mental Health, Geneva.

Barry, K. L. and Flemming, M. F. (1990) Computerized administration of alcoholism screening tests in a primary care setting. *Journal of the American Board of Family Practice* **3**, 93–98.

Bien, T. H., Miller, W. R. and Tonigan, J. S. (1993) Brief interventions for alcohol problems: a review. *Addiction* **88**, 315–336.

Bohn, M. J., Babor, T. F. and Kranzler, H. R. (1995) The Alcohol-Use Disorders Identification Test (AUDIT): validation of a screening instrument for use in medical settings. *Journal of Studies on Alcohol* **56**, 423–432.

Bradley, K. A., Boyd-Wickizer, J., Powell, S. H. and Burman, M. L. (1998) Alcohol screening questionnaires in women. *Journal of the American Medical Association* **280**, 166–171.

Carr, A. C., Ancill, R. J., Ghosh, A. and Margo, A. (1981) Direct assessment of depression by microcomputer. *Acta Psychiatrica Scandinavica* **64**, 415–422.

Claussen, B. and Aasland, O. G. (1993) The Alcohol-Use Disorders Identification Test in a routine health examination of long-term unemployed. *Addiction* **88**, 363–368.

Conigrave, K. M., Hall, W. D. and Saunders, J. B. (1995*a*) The AUDIT questionnaire: choosing a cut-off score. *Addiction* **90**, 1349–1356.

Conigrave, K. M., Saunders, J. B. and Reznik, R. B. (1995*b*) Predictive capacity of the AUDIT questionnaire for alcohol-related harm. *Addiction* **90**, 1479–1485.

Davis, L. J. and Morse, R. M. (1991) Self-administered alcoholism screening test: a comparison of conventional versus computer administered formats. *Alcoholism: Clinical and Experimental Research* **15**, 155–157.

Griest, J. H., Gustafson, D. H., Strauss, F. F., Rowse, G. L., Laughren, T. P. and Chiles, J. A. (1973) A computer interview for suicide risk prediction. *American Journal of Psychiatry* **130**, 1327–1332.

Levine, S., Ancill, R. J. and Roberts, A. P. (1989) Assessment of suicide risk by computer-delivered self-rating questionnaire: preliminary findings. *Acta Psychiatrica Scandinavica* **80**, 216–220.

Mizutani, A. and Fassler, D. (1985) Computer technology in psychiatric practice: the automated interview in perspective. *Psychiatric Hospital* **16**, 135–140.

Piccinelli, M., Tessari, E., Bortolomasi, M., Piasere, O., Semenzin, M., Garzotto, N. and Tansella, M. (1997) Efficacy of the alcohol-use disorders identification test as a screening tool for hazardous alcohol intake and related disorders in primary care. *British Medical Journal* **314**, 420–424.

Sharkey, J., Brennan, D. and Curran, P. (1996) The pattern of alcohol consumption of a general hospital population in North Belfast. *Alcohol and Alcoholism* **31**, 279–285.

World Health Organization (1992) *International Classification of Diseases*, 10th edn. World Health Organization, Geneva.