Factor Structure of the Alcohol Use Disorders Identification Test (AUDIT) in a Mental Health Clinic Sample

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ABSTRACT. Objective: To examine the factor structure of the Alcohol Use Disorders Identification Test (AUDIT) and to identify the implications of this structure for its clinical use. Method: The AUDIT was administered to mental health clinic outpatients (N = 197; 86% men) at high risk for alcohol-use disorders. Confirmatory and exploratory factor analyses were used to determine the underlying factor structure of the AUDIT for this high-risk population. Results: Confirmatory analyses indicated that the a priori three- and one-factor solutions did not fit the observed data. The exploratory analyses supported a two-factor solution that included level of alcohol consumption and drinking problems, with both factors explaining substantial variance in AUDIT scores. These findings contrast the original three-factor design of the AUDIT and the conventional use of the AUDIT as a one-factor screening device with a single cutoff score. Conclusions: Other screening methods that incorporate this two-factor model may be important for mental health patient populations. Replication of these findings among other mental health samples is needed. (J. Stud. Alcohol 61:751-758, 2000)

THE Alcohol Use Disorders Identification Test (AUDIT) (Babor et al., 1992) contains 10 items created to tap multiple domains associated with problematic alcohol use. Items were selected for inclusion on the basis of face validity, factor analysis and empirical reliability criteria to measure four areas related to alcohol use. The four areas (see Appendix) are: alcohol consumption (Items 1-3), alcohol drinking behaviors that are symptoms of dependence (Items 4-6), adverse psychological reactions to alcohol use (Items 7, 8) and alcohol-related problems (Items 9, 10) (Saunders et al., 1993). The latter two constructs, adverse psychological reactions and alcohol problems, were combined into a single alcohol-related problems construct, apparently to conform the AUDIT to the World Health Organization and ICD-10 concepts of hazardous use, dependence and harmful use (Saunders et al., 1993). It is, therefore, conventionally thought that the AUDIT measures the three domains of alcohol consumption, dependence and alcohol-related problems. However, studies of the empirical validity of this three-factor model in clinical populations are rare. A recent literature review of the utility of the AUDIT called for factor analysis of the instrument to evaluate whether the test items reflect the originally intended constructs (Allen et al., 1997).

Research on the AUDIT has focused heavily on establishing its utility for detecting hazardous or harmful drinking in different populations (Barry and Fleming, 1993; Claussen and Aasland, 1993; Conigrave et al., 1995a,b; Fleming et al., 1991; Hays et al., 1995; Volk et al., 1997). Few studies have examined the factor structure of the AUDIT or the relative contribution of the different item domains in distinguishing between hazardous and nonhazardous drinking. Skipsey et al. (1997) conducted a principal components analysis on the AUDIT among a sample of 82 patients diagnosed with drug dependence. Approximately half of their sample was also diagnosed as alcohol dependent. They found that all items loaded significantly on a single factor, suggesting that the AUDIT is unidimensional for patients with a drug or alcohol disorder. In contrast, Bohn et al. (1995) used item clusters from the AUDIT to predict harmful drinking among a mixed sample of 252 general medical patients and patients diagnosed with alcohol abuse or dependence. Their study found that alcohol consumption (AUDIT Items 1-3), dependence symptoms (Items 4-6) and harmful drinking (Items 7-10) each explained unique variance in differentiating harmful and nonharmful drinkers. Although Bohn et al. (1995) did not factor analyze the AUDIT, their results suggest that all three content areas contributed independently to the identification of alcohol problems among a general medical population.

Given these conflicting findings, a better empirical understanding of the constructs underlying the AUDIT is needed. It is not clear that the distinctions between content areas are
empirically valid and contribute differently to detecting hazardous drinking in different populations. Therefore, the purpose of the present study was to explore the factor structure of the AUDIT. The AUDIT was designed for use in health care facilities to detect hazardous or harmful alcohol use among people at risk for alcohol dependence, rather than to detect the presence of established dependence. For this study, it was administered to a sample of outpatients currently in treatment at a mental health clinic in a Veterans Affairs Medical Center. The risk of alcohol-use problems is high among patients with mental disorders (Regier et al., 1990); therefore, the need for adequate screening tools for this population is great. The primary hypothesis of this study was that items on the AUDIT would fit a three-factor solution, conforming to the original item domains of alcohol consumption, dependence symptoms and alcohol-related problems, and consistent with the work of Bohn et al. (1995).

In light of the one-factor solution observed by Skipsey et al. (1997), this study also sought to test the goodness-of-fit of the one-factor model. Results on the optimal factor structure may have implications for using the AUDIT in clinical practice with psychiatric patients.

Method

Participants

Participants for this study were mental health outpatients (N = 197) seeking treatment at an outpatient mental health clinic at the Veterans Affairs San Diego Healthcare System (VASDHS) between October 1996 and October 1997. The only inclusionary criterion was that patients complete the AUDIT. There were no exclusionary criteria. Of the original total of 263 patients, 66 did not complete the AUDIT, resulting in a sample size of 197 and a corresponding completion rate of 75%. Patients who completed the AUDIT had an average (SD) age of 42 (12.3) (range from 18 to 86). Men accounted for 86% of the sample. Information on the ethnic background and education level of participants was not available. On the basis of chart reviews, 48% were diagnosed with a depressive disorder, 15% were diagnosed with an anxiety disorder, 13% were diagnosed with bipolar disorder and 11% were diagnosed with schizophrenia or schizoaffective disorder. No clear chart diagnosis could be identified for the remaining 13% of the participants. Chart evidence of substance-use disorders existed for 5%.

Procedure

The AUDIT was administered to both new and continuing patients at an outpatient mental health clinic to help determine the extent of alcohol problems among the patients. University of California, San Diego, Institutional Review Board approval was obtained to use the results of the AUDIT for research purposes. For new patients, the AUDIT was incorporated into the intake assessments and was, therefore, completed as part of a battery of questionnaires. Continuing patients were asked by the receptionist at the clinic to complete the AUDIT upon their arrival for a scheduled appointment. The AUDIT appeared on the front side of a two-sided questionnaire; the CAGE Questionnaire (Mayfield et al., 1974), modified to ask about alcohol and drug use, was on the back. At the top of the questionnaire was the following statement: “The purpose of this questionnaire is to help determine whether you might have a problem with the use of alcohol (beer, wine, or liquor like vodka, whiskey, rum, etc.) or drugs (cocaine, amphetamines, heroin, marijuana, etc.). If you might have a problem and want help, the VA can offer you treatment alternatives.” Continuing patients were asked to return the AUDIT to the receptionist when completed. New patients submitted the AUDIT to an intake interviewer along with other intake materials. For all patients, the AUDIT was self-administered. The AUDIT was scored according to the standard procedures (Saunders et al., 1993).

Instrument

The AUDIT has demonstrated good internal consistency in previous work (Cronbach’s alpha = 0.85-0.94) (Barry and Fleming, 1993; Skipsey et al., 1997). It has adequate criterion validity, with sensitivity for alcohol-misuse diagnoses generally ranging from 0.60 to 0.95 and specificity ranging from 0.84 to 0.96 at the most commonly recommended cutoff score of 8 (Cherpitel, 1995; Saunders et al., 1993; Skipsey et al., 1997).

Data analysis

Confirmatory factor analysis (CFA) was used to evaluate the three- and one-factor models of the AUDIT. The three-factor CFA tested the item domains of the AUDIT suggested by Saunders et al. (1993) (i.e., Items 1-3, 4-6 and 7-10; see Appendix) and allowed for correlated factors (i.e., oblique solution). The one-factor CFA loaded all 10 AUDIT items onto a single factor, consistent with the findings by Skipsey et al. (1997). Three absolute fit indices were used to evaluate the adequacy of each model. These indices included the chi-square (χ²) test statistic, the standardized root mean squared residual (SRMR; Bentler, 1995) and Gamma Hat (Steiger, 1989). The χ² statistic was selected because a probability test of its value is available and it is a widely used summary measure of model fit. A critical p level of .05 was selected for the chi-square test. SRMR and Gamma Hat were selected on the basis of empirical work by Hu and Bentler (1999) in which these two absolute indices were the best measures of model fit for a sample size < 250. Hu and Bentler (1999) found that
the sum of Type I and Type II error rates was minimized when the criteria for rejecting a model was set at SRMR > 0.09 and Gamma Hat < 0.96. In the present study, the same cutoff values were used. Each CFA was conducted using SAS software with proc calis and the maximum likelihood estimation method (SAS, 1993).

Subsequent to the findings from the confirmatory analyses, three types of exploratory factor analysis were employed in an effort to identify a factor solution more consistent with the observed data. Since Principal Components Analysis (PCA) was used by Skipsey et al. (1997) in their study of the AUDIT, we incorporated the same approach here to determine if we could replicate their findings. Principal Axis Factoring (PAF) and Maximum Likelihood Factoring (MLF) were also selected to provide additional data on the factor structure. Given that these were exploratory analyses, the number of factors to be extracted was not specified a priori.

Following each exploratory factor analysis, an orthogonal rotation was used in order to replicate the procedure used by Skipsey et al. (1997) and to facilitate interpretation of the factor loadings. We chose not to use oblique rotations in the exploratory analyses to ensure that methodology would not confound the comparison of our results with those of Skipsey et al. In evaluating the results of these analyses, the cutoff for determining whether an item significantly contributed to a specific factor was set at a loading of 0.5. The standard convention of an eigenvalue > 1 was used to determine whether a factor was a significant construct. Because the AUDIT has 10 items, an eigenvalue of 1 corresponded to 10% of the overall variance being explained by a factor. All exploratory analyses were conducted using SPSS software procedure FACTOR, extraction types PCA, PAF and MLF, and rotation VARIMAX (Norusis, 1990).

In all the procedures, the AUDIT items were analyzed as continuous variables. Although the AUDIT has Likert-scale (i.e., ordinal) items, we chose not to use polychoric correlations because of the fairly small sample size. Researchers have observed that, with small sample sizes, polychoric correlation matrices do not provide stable factor solutions (Gustafsson and Stahl, 1997, p. 209). We have, instead, followed Gustafsson and Stahl’s recommendation to treat the data as continuous and to use the maximum likelihood estimation method in the confirmatory and exploratory factor analyses.

Results

Reliability checks

The AUDIT demonstrated high internal consistency for the entire mental health sample (Cronbach’s alpha = 0.89). This finding parallels other research on the AUDIT that has found alpha reliability coefficients of 0.85 to 0.94 (Barry and Fleming, 1993; Skipsey et al., 1997). In the present sample, internal consistency was high for patients diagnosed with anxiety disorder (alpha = 0.95), bipolar disorder (alpha = 0.89), depressive disorder (alpha = 0.88) and psychotic disorder (alpha = 0.86). Pearson correlations are provided in Table 1. Interitem correlations ranged from 0.10 (Item 1 and Item 9) to 0.79 (Item 4 and Item 5). Correlations between individual items and the total AUDIT score tended to be high, ranging from a low of 0.39 (Item 9 and total score) to a high of 0.84 (Item 4 and total score).

Prevalence of harmful drinking

Average scores for each item and the total score are displayed in Table 1. The average (SD) total score for the sample was 4.87 (7.24), with a range from 0 to 37. A total AUDIT score of greater than or equal to 8 was used as the cutoff to determine the prevalence of problem drinking. Among the total sample (N = 197), 23% of patients scored in the problem-drinking range; 24% of patients diagnosed with an anxiety disorder, 19% of patients with a psychotic disorder and 16% of patients with bipolar disorder or a depressive disorder scored 8 or above.

| Table 1. Means (standard deviations) and correlations of the AUDIT items |
|---------------|---------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Item no.      | Mean (SD) | 1.  | 2.  | 3.  | 4.  | 5.  | 6.  | 7.  | 8.  | 9.  | 10. |
| 1.            | 1.20 (1.40) | 1.00 |     |     |     |     |     |     |     |     |     |
| 2.            | 0.56 (1.11) | 0.51 | 1.00 |     |     |     |     |     |     |     |     |
| 3.            | 0.57 (1.06) | 0.67 | 0.77 | 1.00 |     |     |     |     |     |     |     |
| 4.            | 0.37 (1.00) | 0.46 | 0.58 | 0.66 | 1.00 |     |     |     |     |     |     |
| 5.            | 0.29 (0.78) | 0.38 | 0.49 | 0.58 | 0.79 | 1.00 |     |     |     |     |     |
| 6.            | 0.23 (0.81) | 0.38 | 0.43 | 0.40 | 0.61 | 0.62 | 1.00 |     |     |     |     |
| 7.            | 0.38 (0.96) | 0.44 | 0.44 | 0.55 | 0.73 | 0.64 | 0.44 | 1.00 |     |     |     |
| 8.            | 0.20 (0.65) | 0.35 | 0.43 | 0.40 | 0.47 | 0.52 | 0.71 | 0.29 | 1.00 |     |     |
| 9.            | 0.22 (0.72) | 0.10 | 0.33 | 0.19 | 0.21 | 0.23 | 0.15 | 0.26 | 0.23 | 1.00 |     |
| 10.           | 0.83 (1.46) | 0.45 | 0.50 | 0.51 | 0.57 | 0.55 | 0.41 | 0.63 | 0.33 | 0.33 | 1.00 |
| Total         | 4.87 (7.24) | 0.71 | 0.77 | 0.82 | 0.84 | 0.78 | 0.68 | 0.76 | 0.61 | 0.39 | 0.77 |
Confirmatory factor analysis (CFA)

Results from the CFA indicated that the three-factor solution specified a priori was significantly different from the pattern of observed data ($\chi^2 = 172.23$, 32 df, $p < .001$; SRMR = 2.07; Gamma Hat = 0.88). Item-to-factor loadings from the analysis are provided in Table 2. The loadings did appear to support an Alcohol Consumption factor comprised of the first three AUDIT items and a Dependence factor comprised of Items 4-6. Item 9 (someone injured as a result of drinking, an alcohol problem) did not load significantly on the Alcohol-Related Problems factor (loading = 0.31). The inadequate fit of the three-factor model appeared to be related to the between-factor correlations; specifically, a very high correlation ($r = 0.95$) was observed between the Alcohol Dependence and Alcohol-Related Problems factors. This finding suggests extensive overlap between these content areas in which individual items may load highly on both factors. Smaller, yet still strong, correlations were also observed between the Alcohol Consumption factor and the Dependence and Alcohol-Related Problems factors ($r = 0.73$ and $r = 0.75$, respectively).

The one-factor solution tested by CFA also did not provide a good fit to the observed data ($\chi^2 = 293.44$, 35 df, $p < .001$; SRMR = 2.41; Gamma Hat = 0.65). Item-to-factor loadings from the one-factor analysis are provided in Table 2. The loadings ranged from a low of 0.29 for Item 9 (someone injured as a result of drinking, an alcohol problem) to a high of 0.89 for Item 4 (unable to stop drinking, a dependence symptom). Although neither the three-factor nor the one-factor models adequately reflected the observed data, a comparison between the models was conducted to determine if one model was superior. Results indicated that the three-factor solution provided a better fit than the one-factor solution ($\chi^2$ difference = 121.21, 1 df, $p < .001$).

Exploratory factor analysis

PCA extraction. A two-factor structure resulted from the PCA extraction (see Table 3). All three alcohol consumption items (1-3) loaded on the first factor, along with feeling guilty after drinking (Item 7; a psychological reaction) and having a friend or doctor express concern about drinking (Item 10; an alcohol problem). Inability to stop drinking and role failures (Items 4 and 5; both dependence symptoms) also loaded significantly on this first factor, but these items also loaded on the second factor along with morning drinking/withdrawal (Item 6; a dependence symptom) and unable to remember the night before/blackouts (Item 8; a psychological reaction). Item 9 did not load significantly on either factor. Overall, the PCA factor structure showed consumption and two nonphysiological alcohol problems clustering on the first factor. This factor accounted for 37.1% of the variance. Physiological alcohol problems (blackouts and morning drinking) loaded the highest on a second factor that accounted for 26.4% of the variance. As stated, two alcohol dependence symptoms (Items 4 and 5) loaded on both factors.

PAF extraction. Results of the factor solution for the PAF extraction are presented in Table 3. The analysis showed a two-factor solution that was virtually identical to that seen in the PCA. Again, consumption (Items 1-3) and two nonphysiological alcohol problems (Items 7 and 10) clustered on the first factor, two physiological alcohol problems (blackouts and morning drinking) clustered on a second factor and two alcohol dependence symptoms (Items 4 and 5) loaded on...
both factors. Here the two factors accounted for 34.0% and 22.3% of the variance, respectively.

**MLF extraction.** Consistent with both the PCA and PAF approaches, the MLF extraction also resulted in a two-factor solution. Here, however, a clearer distinction appeared between alcohol consumption and signs of problem drinking. The three AUDIT items that addressed consumption (Items 1-3) loaded significantly on a single factor. This factor accounted for 24.0% of the variance and no other items from the AUDIT loaded significantly on this factor. With the exception of Item 9 (injury as a result of drinking; an alcohol problem), all the remaining items loaded on a second factor that accounted for 31.7% of the variance. The content of this factor appeared to be signs of problem drinking. In contrast to the other two exploratory analyses, the MLF approach did not suggest a distinction between physiological and non-physiological problems. Rather, one factor clearly represented consumption and a second factor clearly represented signs of problem drinking.

### Discussion

The items on the AUDIT were originally intended to tap three dimensions related to risk for hazardous or harmful alcohol use. Although the items on the AUDIT are face-valid indicators of the content areas they were intended to measure, in this study the empirical validity approach using factor analysis did not support the conclusion that the AUDIT is comprised of three factors. Neither do the results replicate prior findings by Skipsey et al. (1997) of a single-factor structure for the AUDIT.

The presence of two factors underlying the AUDIT was supported by the data. The exploratory analyses helped reveal the nature of this alternative model. In the PCA, PAF and MLF analyses, the three alcohol consumption items (Items 1-3) consistently clustered together. The items that seemed to address physiological signs of problem drinking (e.g., withdrawal/morning drinking and blackouts; Items 6 and 8), clustered together on a second factor in all of the exploratory analyses. Thus, the distinction between factors of alcohol consumption and physiological alcohol-related problems was clear.

Less convergence across the analyses was observed for the items that addressed intra- and interpersonal problems (Items 4, 5, 7 and 10). In the MLF analysis, these items (comprising loss of control of drinking, failure to perform as expected by others, feeling guilt or remorse after drinking, and having someone else express concern about the patient’s drinking) clustered with the physiological problem items. In addition, in the confirmatory factor analysis, the dependence and alcohol-related-problems factors that collectively contained all of the problem-drinking items were very highly correlated. Yet in the PCA and PAF analyses, a more complex picture emerged. Item 7 (remorse after drinking) and Item 10 (others expressing concern about drinking) loaded on the consumption factor. Item 4 (loss of control over drinking) and Item 5 (failed to do as expected) significantly loaded on both the consumption and the problem-drinking factors. These results again may suggest that the alcohol consumption and alcohol problem factors were correlated, although the strength of this association was weaker for physiological problems. In other words, whereas high levels of alcohol consumption often resulted in feelings of remorse and in others taking notice of the person’s drinking, high consumption was not necessarily accompanied by such physiological problems as blackouts or withdrawal/morning drinking.

In all the factor analyses, Item 9 (reporting that you or someone else was injured as a result of your drinking) did not load significantly on any factor. This may suggest that the item does not contribute to the measurement of any important construct on the AUDIT and may not contribute to the sensitivity and specificity of the instrument.
In summary, we view the preponderance of evidence from this study as suggestive that alcohol consumption (Items 1-3) and signs of problem drinking (Items 4, 5, 6, 7, 8 and 10) are separate but related constructs underlying the AUDIT in a high-risk population. We include Items 7 and 10 in the list of alcohol problems on conceptual grounds, although the factor loadings for these items were decidedly mixed. Notably, this two-factor solution is not consistent with a study by Skipsey et al. (1997) that found a single-factor solution for the AUDIT. Skipsey and colleagues (1997) studied diagnostically homogeneous participants who had already developed substance dependence disorders. In contrast, we studied a heterogeneous group of participants with multiple psychiatric disorders who are at risk for developing substance dependence. The single-factor solution found in the Skipsey study may have been related to the diagnostic homogeneity and greater prevalence and severity of alcohol problems in that population. Level of consumption and drinking problem factors may be less distinguishable in homogeneous substance dependent populations. In our high-risk mental health population, some patients may have high consumption without yet experiencing negative consequences of their use. As suggested by Allen et al. (1997), the factor structure of the AUDIT may vary depending on the patient sample.

The two-factor solution supported by the present study is an important finding given that the AUDIT is conventionally scored as a single-factor instrument regardless of the patient population (i.e., the total on all 10 items is used to identify individuals at risk for hazardous drinking). The present findings, from a population at high risk for development of alcohol dependence, suggest a middle ground between the original three-factor design of the AUDIT and its conventional single-factor use. The results suggest that high-risk mental health populations should be assessed along two dimensions of the AUDIT: level of alcohol use (Items 1-3) and signs of problems associated with drinking (Items 4, 5, 6, 7, 8 and 10; again, with the caveat that Items 7 and 10 may ultimately be found to be more associated with consumption than with alcohol problems). The clinical implications of this two-factor screening approach are that individuals with high levels of consumption who have not yet developed problems from drinking may benefit from different interventions than individuals who have already experienced drinking problems. For patients whose alcohol consumption is high but with whom few problems exist, prevention efforts may be indicated. On the other hand, patients with both high consumption and significant problems may be candidates for further evaluation and possibly more intensive treatment.

Another implication of this study pertains to the criterion validity of the AUDIT. In previous research, sensitivity and specificity rates for predicting an alcohol disorder based on an AUDIT score of 8 points or more have varied considerably. This variation appears to be sample-dependent. For example, the AUDIT has demonstrated good criterion validity for medical inpatients (Russell et al., 1993) and emergency room patients (Cherpitel, 1995), yet poor validity for primary care outpatients (Schmidt et al., 1995). The present study raises one hypothesis for this variability, which is that reduced criterion validity may result when consumption and consequences are collapsed into a single score for samples with fairly distinct consumption and consequences factors. An alternative scoring of the AUDIT may improve its ability to predict an alcohol-use disorder among certain patient samples. One such alternative might be the development of a cutoff score based on consequences alone.

One limitation of the study is that, in this sample of convenience, we did not carry out structured diagnostic evaluations. As a result, we could not determine the sensitivity and specificity of different AUDIT cutoff scores for detecting abuse disorders in a mental health clinic sample. The 23% prevalence of harmful drinking found in our mental health clinic sample was similar to the 22% prevalence of any alcohol (abuse or dependence) disorder found for patients with a mental disorder in the Epidemiologic Catchment Area Study (Regier et al., 1990). However, without careful diagnostic evaluations, the prevalence of harmful drinking we reported for different psychiatric disorders should be interpreted cautiously. Another limitation was that 25% of patients in the study did not complete the AUDIT. It is unknown to what extent each patient's alcohol involvement, psychiatric illness, difficulty in reading instructions, or other unknown factors contributed to the likelihood of completing the AUDIT. Many participants simply did not turn the form over to complete the back. Nonetheless, it is of concern that a self-selection bias affected the pattern of scores on the AUDIT and, hence, the observed factor structure. From a clinical standpoint, it is troubling that one quarter of patients given the AUDIT did not complete the entire form when it was self-administered. The utility of the self-administered AUDIT in a mental health clinic population may be questioned if there is only a 75% chance that the form will be completed. Completion rates might be improved if treatment staff assist patients who do not complete the AUDIT; however, this would compromise the convenience and utility value of the instrument.

Several issues for future research arise from the present study. Additional factor analytic work should be undertaken with diverse patient populations to evaluate further how the factor structure of the AUDIT varies, depending on the patient sample. As in the present study, archival clinical data sets of AUDIT scores may provide an ideal testing ground in terms of both time and cost effectiveness. Also, the extent to which the observed two-factor solutions generalize to other mental health outpatients cannot yet be known; future research, using confirmatory factor analysis to test these factor structures in independent patient samples, is necessary to establish the external validity of the findings. Other areas for research include establishing the criterion validity of
alternative scoring procedures (e.g., the use of AUDIT items that measure only alcohol-related problems) and testing the utility of a two-factor screening approach to inform intervention efforts. This approach could be tested by examining: (1) whether scores on the consumption and problem factors relate to other, more rigorous measures of consumption and problem drinking; (2) whether the relationship between these two factors varies as a function of misuse severity; and (3) whether the profile of scores across the two factors can then be used to predict the effectiveness of prevention or treatment strategies.

In conclusion, the present study offers an initial analysis of the AUDIT in a high-risk population and provides evidence that the related constructs of alcohol consumption and problem drinking are most salient. The traditional use of the AUDIT as a one-factor instrument may be responsible for the variability in sensitivity and specificity rates observed across patients who are at high versus low risk for alcohol problems (e.g., Barry and Fleming, 1993; Schmidt et al., 1995). Considering alcohol use and problem drinking as separate but related constructs in the evaluation of AUDIT scores may help to provide a more precise indicator of risk for alcohol abuse and dependence across diverse populations.

Acknowledgments

The authors thank the Brown University Center for Alcohol and Addiction Studies and the Department of Veterans Affairs for providing the environments in which to conduct this research. We also thank Tom Smith, Ph.D., for statistical consultation and Marta LaBelle for assistance with data collection.

Appendix: Content Areas on the Alcohol Use Disorders Identification Test (AUDIT)

**Alcohol consumption**

Item 1. How often do you have a drink containing alcohol?

Item 2. How many drinks containing alcohol do you have on a typical day when you are drinking?

Item 3. How often do you have six or more drinks on one occasion?

**Alcohol dependence**

Item 4. How often during the last year have you found that you were not able to stop drinking once you had started?

Item 5. How often during the last year have you failed to do what was normally expected from you because of drinking?

Item 6. How often during the last year have you needed a first drink in the morning to get yourself going after a heavy drinking session?

**Psychological reactions**

Item 7. How often during the last year have you had a feeling of guilt or remorse after drinking?

Item 8. How often during the last year have you been unable to remember what happened the night before because you had been drinking?

**Alcohol-related problems**

Item 9. Have you or someone else been injured as a result of your drinking?

Item 10. Has an injury resulted from your drinking?

References


