VALIDATION OF THE ALCOHOL USE DISORDERS IDENTIFICATION TEST (AUDIT) AS A SCREENING TOOL FOR ALCOHOL-RELATED PROBLEMS AMONG NIGERIAN UNIVERSITY STUDENTS

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Abstract — Aims: To investigate the screening properties of the alcohol use disorders identification test (AUDIT) in the detection of alcohol-related problems among Nigerian university students. **Methods:** Eight hundred and ten students completed the AUDIT. A percentage of them were assessed for alcohol-related diagnosis with structured clinical interview. **Results:** The AUDIT at cut-off of 5 and above could clearly identify participants with alcohol-related problems with sensitivity of 0.935 and specificity of 0.915. **Conclusions:** The AUDIT is a valid instrument for screening for alcohol-related problems in Nigerian university students.

INTRODUCTION

Alcohol-related problems are a major public health issue. A review of the studies on alcohol use in Nigeria shows that there has been a rapid increase in alcohol availability and consumption in recent times with young adults in universities and colleges being those mainly concerned (Abiodun, 1991). Most alcohol-related problems appear in non-alcoholic dependent individuals who fall into the categories of hazardous or harmful drinkers according to the WHO (2000) terminology. Studies have shown that drinking above the WHO recommendations (Dawson and Archer, 1993; Anderson, 1996), raises the risk of alcohol-related physical and psychosocial problems.

Studies in Nigeria have focussed on lifetime and current prevalence rates of alcohol use (Odejide *et al*., 1987; Adelekan *et al*., 1992) without exploring alcohol-related problems. There is an urgent need to encourage extensive epidemiological and longitudinal studies of alcohol-related problems in Nigeria in order to accurately determine the populations at risk. Early detection of people with hazardous alcohol intake and time bound interventions aimed at decreasing alcohol consumption and thus the likelihood of harm and dependence is warranted. This first step in doing this is to validate an appropriate screening instrument for the detection of alcohol-related problems among the targeted population in Nigeria. Such an instrument is the alcohol use disorders identification test (AUDIT).

The AUDIT (Saunders and Aasland, 1987; Saunders *et al*., 1993) was developed as part of the WHO collaborative project on the detection and management of alcohol-related problems in Primary Health Care, to identify hazardous and harmful alcohol use. Several screening instruments have been developed that are fairly short and easily administered, but they tend to detect severe alcohol disorders such as dependence and overlook hazardous drinking. Literature supports the use of AUDIT for less severe alcohol-related problems (Fiellin *et al*., 2000).

This study aims to investigate the screening properties of the AUDIT in the detection of alcohol-related problems among Nigerian university students.

SUBJECTS AND METHODS

Study population

The study group consist of students of Obafemi Awolowo University, Ile-Ife, in South-western Nigeria. It is a federal university offering both undergraduate and postgraduate degrees with ∼30 000 students from various cultural groups. There are 10 faculties and 12 halls of residence. Eight of the halls of residence are located inside and four outside the university campus.

Sample size and sampling technique

Because some of the halls have more blocks of flats and more rooms than the others, a multistage sampling technique was adopted. In the first phase, the blocks of flats in each hall were mapped out. The flats with even numbers were then selected. After that, even-numbered rooms in each flat were subsequently selected. In the third stage a student was selected at random from each of the even-numbered rooms for the interview. A final sample of 822 was therefore obtained. Out of this number, 12 refused to participate leaving a sample size of 810.

Procedure

The Ethics and Research Committee of the university approved the study protocol and informed consents were obtained from the participants after the aims and objectives of the study had been explained. Previously trained research assistants who are medical students explained the size of a standard drink to those agreeing to participate. A standard drink was defined as equivalent volumes containing an average of 13.5 g ethanol.

The participants then complete the AUDIT questionnaire. The AUDIT is a self-rated 10-item questionnaire with each item scored 0–4, giving a total score of 40. Several studies have shown its validity and reliability in the detection of hazardous drinking, alcohol misuse, and alcohol dependence. (Bohn *et al*., 1995; Piccineli *et al*., 1997). Depending on the cut-off and the criterion standards used, studies have reported

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sensitivities between 51 and 97%, and specificities between 78 and 96%. (Fiellin *et al.*, 2000).

The participants were then divided into two groups based on their AUDIT scores. The first group consists of those scoring 4 ($n = 186$) and above, and the second group consists of those scoring below 4 ($n = 624$). A psychiatrist blind to the AUDIT scores then used the Composite International Diagnostic Interview (CIDI) to assess all participants in the first group and a randomly selected 10% ($n = 62$) of those in the second group (making a total of 248) for alcohol-related problems. There is no significant difference in the age, sex, and AUDIT scores between the randomly selected 10% and the remaining 90% in the groups with scores below 4. The CIDI (Smeets and Dingemans, 1993) is a structured interview developed by the WHO and based on the National Institute of Mental Diagnostic Schedule and the Present State Examination. It was designed for use by trained interviewers who are not clinicians. The CIDI assesses mental disorders according to the ICD-10 (WHO, 1992). Alcohol dependence and harmful use were diagnosed according to the ICD-10 criteria. All participants whose weekly alcohol consumption was above the WHO recommendation (280 g for men ad 168 g for women) and/or who fulfilled the criteria for hazardous drinking (WHO, 2000) were diagnosed as having hazardous alcohol intake.

Data analysis

The Statistical package for the Social Sciences 11(SPSS.11) program was used for statistical analysis. Cases were defined according to their ICD-10 diagnosis. Results were calculated as frequencies (%), means, and standard deviations. Screening parameters including sensitivity, specificity, and predictive values were calculated for the AUDIT scores. Spearman correlation was used to establish concurrence between the ICD-10 diagnosis and the AUDIT scores. The psychometric performance of the AUDIT was compared with the ICD-10 diagnosis using the receiver operating characteristic (ROC) curve. The area under the curve (AUC) was also calculated. All tests were 2-tailed, and the level of significance was set at $P < 0.05$.

RESULTS

A total of 248 participants completed both the AUDIT questionnaire and the clinical interview. This group include 181 (73.0%) males. There were 225 (90.7%) undergraduates and 229 (92.3%) were single. The mean age in years was 22.5 (SD = 5.2), 107 (43.1%) of the participants were diagnosed to be having alcohol-related problems. The participants' score on the AUDIT questionnaire correlated well with the clinical diagnosis with correlation co-efficient of 0.780 ($P < 0.001$). The mean AUDIT scores for participants with each of the clinical diagnoses are outlined in Table 1.

Table 1. The mean AUDIT scores of participants according to their clinical diagnosis

Diagnosis	Number	Mean AUDIT scores	Range of AUDIT scores
No alcohol-related problem	141	3.08 (SD = 1.92)	0–9
Hazardous alcohol use	76	6.09 (SD = 1.52)	1–12
Harmful alcohol use	25	9.12 (SD = 2.79)	4–18
Alcohol dependence	6	16.67 (SD = 5.79)	9–24

When the psychometric properties of the AUDIT were tested against the diagnostic criteria with ROC analysis, it was found that the questionnaire performed well in detecting subjects with alcohol-related problems. For participants with diagnosis of hazardous alcohol use, the AUC was 0.933 (95% CI 0.900–0.967); for participants with diagnosis of harmful use the AUC was 0.948 (95% CI 0.904–0.992), and for participants with alcohol dependence diagnosis, the AUC was 0.985 (95% CI 0.961–1.008). Figure 1 shows the ROC curve of the AUDIT in screening for alcohol-related problems.

The performance of the AUDIT against the clinical diagnoses is shown in Table 2. From the table it was clear that a cut-off of 5 and above will be most appropriate for hazardous alcohol use with sensitivity (ability of the AUDIT to identify correctly all screened participants who actually had alcohol-related problems) of 0.935, specificity (ability of the AUDIT to identify correctly all screened participants who were not
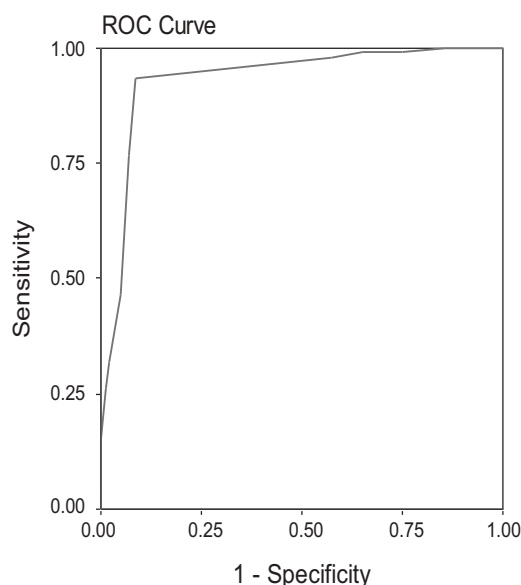

Fig. 1. The receiver operating characteristic (ROC) curve of the AUDIT in screening for alcohol-related problems.

Table 2. The performance of the recommended cut-off scores of AUDIT against the three clinical diagnoses of alcohol-related problems

Cut-off	Sensitivity	Specificity	Positive predictive value (PPV)	Negative predictive value (NPV)
Hazardous use				
3	0.991	0.248	0.535	0.980
4	0.981	0.348	0.565	0.968
5	**0.935**	**0.915**	**0.893**	**0.948**
6	0.766	0.925	0.891	0.840
7	0.467	0.950	0.919	0.731
Harmful use				
6	0.933	0.706	0.304	0.987
7	**0.900**	**0.862**	**0.474**	**0.984**
8	0.767	0.968	0.702	0.981
Dependence				
8	1.000	0.872	0.162	1.000
9	**1.000**	**0.941**	**0.200**	**1.000**
10	0.833	0.955	0.313	0.987

NB: Bold values are recommended cut-off scores

having alcohol-related problems) of 0.915, positive predict-ive value (PPV, proportion of participants screened positive by AUDIT who were actually having alcohol-related problems) of 0.893, and negative predictive value (NPV, proportion of participants screened negative by AUDIT who actually were not having alcohol-related problems) of 0.948. Lowering the cut-off to 4 would cause a significant lowering of the specifi-city to 0.348 and PPV to 0.565 without any significant gain in other parameters. Also, raising the cut-off to 6 would cause the sensitivity to fall drastically.

For the diagnosis of harmful use and alcohol dependence, Table 2 shows that it would be appropriate to recommend cut-offs of 7 and 9, respectively.

DISCUSSION

This study has shown that the AUDIT can be effectively used to detect people with formal alcohol disorders and those having hazardous alcohol intake in Nigeria. The recommen-ded cut-off of 5 and above for hazardous alcohol use in this study is in agreement with the recommended cut-off for this questionnaire in Italy (Piccinelli *et al.*, 1997) although lower than the cut-offs of 7 and above among males, and 5 and above among females proposed in Spain (Gual *et al.*, 2002).

These differences may not be too surprising. Although the current psychiatric classificatory systems commonly provide similar criteria for the identification of disorders relating to the use of alcohol, the cultural views of alcohol use disorders are influenced by prevailing norms in the society. It is likely that there is a cross-cultural difference in the threshold for the identification of disorders relating to the use of alcohol. It has been suggested that even though some similarities exist with respect to the definition of problematic use of alcohol in ethnically diverse societies, very substantial differences also exist. A number of core concepts underpinning diagnosis of disorders relating to the use of alcohol have no equivalents in the local languages of the various cultures, while some oth-ers lacked cultural applicability because of their relative 'dis-tance' from cultural and ethnic norms of drinking (Gureje *et al.*, 1996).

This study also showed AUDIT to be useful in screening for harmful use and dependence among Nigerian university stu-dents with cut-offs of 7 and 9, respectively. The PPV when using AUDIT to screen for alcohol dependence was however found to be low indicating a high proportion of false positive result. This could have resulted from the 10 items of the ques-tionnaire being given the same weight in computing the total scores. There are, of recent, studies advocating a shorter form of the AUDIT questionnaire (Gual *et al.*, 2002).

The limitations of this study include the fact that a propor-tion of participants with alcohol-related problems may have under-reported them both on the AUDIT screening question-naire and the clinical interview. This may have raised the validity co-efficient of the AUDIT questionnaire. It was also noticed that some participants complained about the length of the AUDIT, and an increase in the participant's defensive-ness when answering questions 4–10 dealing with alcohol dependence and alcohol-related problems was noticed during

the screening. Suitable short forms of AUDIT may need to be examined and studied for screening properties. This study is also limited by the probability of observer variation, because all the clinical interviews were performed by a psy-chiatrist. Also, reliability indices of the AUDIT were not assessed because it was only administered once.

This study has shown that AUDIT is a valid and useful instrument in screening for alcohol-related problems among university students in Nigeria. A cut-off score of 5 is recom-mended when screening for hazardous use. Cut-off scores of 7 and 9 are equally recommended when screening for harm-ful use and dependence respectively.

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