

An Empirical Study of Cut-Off Points for the Persian Version of Alcohol Use Disorders Identification Test

SIMASADAT NOORBAKHSH^{1,2,*}, JAMAL SHAMS², REZA LOTFI-LELAHLOO³, PETER WENNBERG⁴, HAKAN KALLMEN⁵

¹Department of Psychiatry, Universite de Montreal, CHU Ste Justine Hospital, Montreal, Canada.

²Behavioral Sciences Research Center of Shahid Beheshti University of Medical Sciences, Tehran, Iran.

³M.A. in Clinical Psychology, Department of Psychology and Educational, Faculty of Psychology, Islamic Azad University of the South Branch

⁴Professor, Department of Public Health Sciences, Stockholm University, Stockholm, Sweden.

⁵Associate Professor, STAD, Centre for Psychiatry Research, Department of Clinical Neuroscience, Karolinska Institute & Stockholm Health Care Services, Stockholm County Council, Sweden.

Abstract

Background: AUDIT is constructed to be able to identify hazardous drinking and less severe alcohol-related problems. The original AUDIT was shown to have a cut-off score of 8 and above for identifying hazardous or harmful alcohol consumption. The aim of this study was to establish the optimal cut-off point of the Persian version of Alcohol Use Disorders Identification Test (AUDIT) in psychiatric out-patients.

Methods: Participants were a sample of consecutive patients at Imam Hossein Hospital (Tehran/Iran). They consisted of 99 patients, 49 of them diagnosed with alcohol dependency and 50 patients randomly selected from a sample of patients using alcohol but with other primary diagnoses. All statistics including means and standard deviations as well as medians and interquartile range were calculated in SPSS 24 software environment.

Results: A Receiver Operating Curve analysis showed that by using a 20-point cut-off, the AUDIT had an optimal combination of sensitivity (.92) and specificity (.74). The rate of discrimination was .88.

Conclusions: Given the high sensitivity and acceptable specificity of the AUDIT, the test can be used as an effective instrument for identification of alcohol use disorders in the Persian psychiatric out-patient population. Furthermore, the receiver operating curve found in this study resembles the one found in previous studies despite the differences in alcohol cultures between Iran and countries with higher alcohol consumption.

Keywords: Alcohol Use Disorder; Alcohol Use Disorders Identification Test (AUDIT); Cut-Off Point; Iranian Version

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INTRODUCTION

With the aim of identifying hazardous and harmful alcohol use foremost in Primary Health Care, the World Health Organization (WHO) commissioned an international consortium in six countries to develop the Alcohol Use Disorders Identification Test (AUDIT). Although there are screening tools, as for example CAGE (acronym for Cut-down, Annoyed, Guilt and Eye-opener), and Michigan Alcoholism Screening Test (MAST), which are adequately short and quickly administered, they primarily focus on dependence and alcoholism (1, 2). However, AUDIT is constructed to be able to identify hazardous drinking and less severe alcohol-related problems (3).

The original AUDIT was shown to have a cut-off score of 8 and above for identifying hazardous or harmful alcohol consumption, so that a person scoring 8 or more was classified as an alcohol drinker with increased risk of alcohol

Problems (4). Based on an old study from Project MATCH, Babor et al. (2001) suggested a tentative AUDIT score of 20 or more as indicating alcohol dependence according to DSM-IV (5, 6). However, in a screening among alcohol dependent out-patients, Donovan et al. showed that some out-patients diagnosed as alcohol dependent according to DSM-IV had an AUDIT score as low as below 8 (7).

This was corroborated by a Spanish study that found an optimal cut-off of 6 AUDIT points for indicating an alcohol diagnosis (abuse or dependence) according to DSM-IV (8). Hagman (2016) found that AUDIT discriminated well between adolescents with an alcohol diagnosis and those without it according to DSM-IV (Area Under the ROC=0.78) and DSM-5 (AUROC=0.80) at a cut-off 8 for women and 9 for men. Coulton et al. (2018) screened nearly 5400 adolescents at 10 emergency departments in England for alcohol dependence by using ICD-10 criteria and found an optimal AUDIT cut-off 7 and AUDIT-C cut-off 5 to identify dependence.

*Correspondence to: Dr. Hakan Kallmen; PhD. Associate Professor, STAD, Centre for Psychiatry Research, Department of Clinical Neuroscience, Karolinska Institute and Stockholm Health Care Services, Stockholm County Council, Sweden

Email: hakan.kallmen@ki.se, Tel: +1 514 792 57 14

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This difference in the suggested cut-offs may indicate difficulties in correctly diagnosing the dependence. A sociological phenomenon proposed to be valid for alcohol consumption is the Collectivity of Drinking cultures that propose high correlation between the average alcohol consumption in a population and the proportion of individuals in the same population drinking a great amount of alcohol (2, 9). This collectivity of drinking has been shown to be valid even among a sub-group as Swedish adolescents (10).

In a society like Iran, where any alcohol consumption is forbidden for religious reasons, it could be expected that both the average consumption and the percentage of individuals with heavy drinking is rather low. It seems probable that heavy drinking is considered as incriminating and easily results in an alcohol diagnosis due to the norm-breaking behavior. It is therefore derived that a lower AUDIT score than in other countries will result in a diagnosis.

This study is aimed at investigating the criterion validity and the optimal cut-off point of the AUDIT to detect probable alcohol dependence in psychiatric outpatients referred to governmental clinics in Tehran (Iran).

METHODS

Participants

Participants were a sample of consecutive patients at Imam Hossein Hospital which is a training hospital located in eastern Tehran covering patients from central and eastern part of Tehran and which is under the supervision of Shahid Beheshti University of Medical Sciences. When calculating the cut-off or assessing alcohol dependency, 99 alcohol consuming psychiatric out-patients were used. There were 49 patients, (48 men and 1 woman) with the mean age 35.87 (SD=10.00), diagnosed with alcohol dependency and 50 (37 men and 13 women with the mean age 33.53 (SD=8.21) were randomly selected from a sample of 82 patients consuming alcohol but with other primary diagnoses.

All of the 99 patients filled out the Alcohol Use Disorders Identification Test (AUDIT) and 49 of them were diagnosed with alcohol dependency according to the Structured Clinical Interview for the DSM-IV (SCID) (11).

Measures

Demographic and psychiatric diagnosis

Patients' age, gender, marital status, and educational level were asked for in an interview before the medical examination. The psychiatrist examined the patient and the diagnosis. Moreover, all data were compared and cross-checked with those in the patient's file.

Alcohol Use Disorders Identification Test (AUDIT)

AUDIT is a 10-item questionnaire constructed to consist of 3 dimensions. Items 1-3 assess alcohol consumption, items 4-6 assess alcohol dependency, and items 7-10 assess alcohol related problems. Questions 1-8 are scored on 5-point scales ranging from 0-4, and questions 9 to 10 are scored 0, 2 and 4, respectively. As a result, a total score between 0 and 40 is possible (12). AUDIT has a high correlation with other alcohol screening tools (13). A score above 8 indicates hazardous drinking and a high risk of AUD in psychiatric patients (14-16). A high internal consistency (0.75 to 0.94) has been reported in various studies (13, 14, 17). Three types

of factor solutions, 1 factor, 2 factors and 3 factors have been indicated in factor analytic studies (18).

Statistics

All statistics including means and standard deviations as well as medians and interquartile range were calculated in SPSS 24 software environment. To assess the criterion validity (sensitivity and specificity), a Receiver Operating Curve (ROC) analysis was performed and the area under the curve (AUROC) was calculated to determine the degree of differentiation between the groups. The optimal cut-off when screening can be seen as the maximal trade-off of specificity for sensitivity. However, in diagnosing alcohol dependence the maximal sum of specificity and sensitivity is recommended by using Youden's J calculated as (sensitivity + specificity - 1) (19).

Ethical approval

The study was approved by the ethical review board of Shahid Beheshti University of Medical Sciences (No. 1379).

RESULTS

A Receiver Operating Curve analysis (ROC) showed that using a 20-point cut-off AUDIT had an optimal combination of sensitivity (.92) and specificity (.74) for screening (Table 1). The rate of discrimination was .88 meaning that AUDIT correctly classified 88% of all the respondents (Figure 1).

Table 1 shows the sensitivities and specificities for eligible cut-off scores. As can be seen, there is a trade-off between true positive cases and false negative cases. The largest difference between a point on the curve and the diagonal is optimal. The

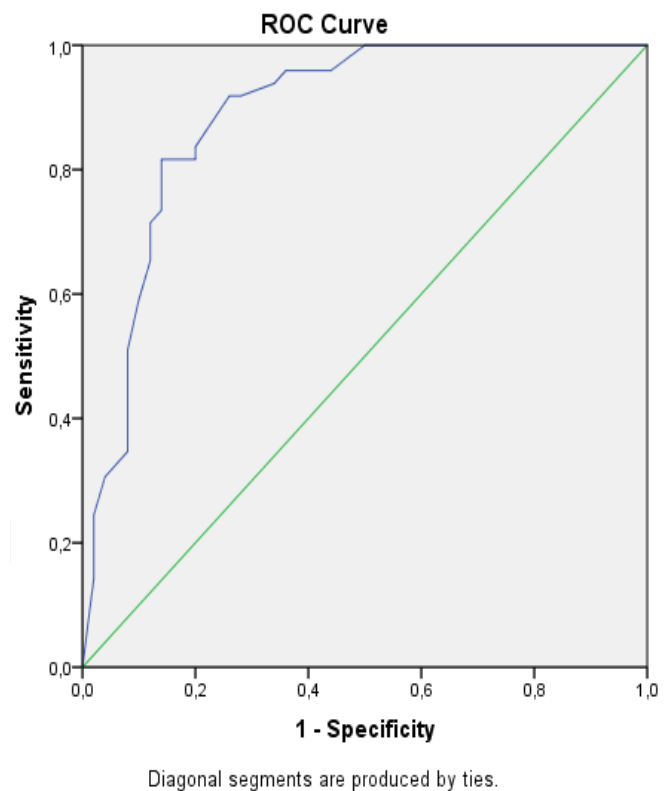


Figure 1. Receiver Operating Curve plotting sensitivity as a function of 1-specificity

Table 1. Sensitivity and specificity for AUDIT to identify alcohol dependent psychiatric patients (N=99).

Cut-Off	Sensitivity	Specificity	Youden's J
1	1.00	0.00	0
2	1.00	0.10	0.1
3	1.00	0.26	0.26
4	1.00	0.32	0.32
5	1.00	0.34	0.34
6	1.00	0.38	0.38
7	1.00	0.42	0.42
8	1.00	0.44	0.44
9	1.00	0.48	0.48
10	1.00	0.50	0.50
11	0.96	0.56	0.52
12	0.96	0.58	0.54
13	0.96	0.62	0.58
15	0.96	0.64	0.60
16	0.94	0.66	0.60
18	0.92	0.72	0.64
20	0.92	0.74	0.66
21	0.84	0.80	0.64
22	0.82	0.80	0.62
23	0.82	0.86	0.68
24	0.74	0.86	0.60
25	0.71	0.88	0.59
27	0.65	0.88	0.53
28	0.59	0.90	0.49
30	0.51	0.92	0.43
32	0.41	0.92	0.33
33	0.39	0.92	0.31
34	0.35	0.92	0.27
35	0.31	0.96	0.27
37	0.24	0.98	0.22
38	0.20	0.98	0.18
39	0.14	0.98	0.12
40	0.14	1.00	0.14

optimal cut-off for screening is 20 points where the sensitivity is .92 and the specificity .74. An increase in the cut-off to 21 is connected with an improved specificity but a numerically larger drop in sensitivity. However, when diagnosing, a higher specificity is reached by using cut-off 23 as indicated by Youden's index.

DISCUSSION

The aim of this study was to find the optimal cut-off point to detect probable alcohol dependency. Cut-off scores for diagnostic classification have not been developed or validated for AUDIT before in an Iranian population. For the

present study, we combined the data from two populations, one with alcohol use disorder and one with all other mental disorders. Overall, our results offer a confirmation of the previous psychometric findings on the Iranian version of the AUDIT. It also provides evidence in support of a cut-off score for diagnostic classification. When screening, a high sensitivity is required to not miss any positive case and a scale core of 20 optimizes the specificity and sensitivity. However, when diagnosing, the specificity is relatively more important and applying the Youden's index; according to which, maximizing the sum of sensitivity and specificity will result in an optimal cut-off on 23 points. The difference is due to an increase in specificity between 20 and 23 AUDIT points. A total scale score of 20 or more that is proposed to be adequate for screening of alcohol dependence is in concordance with the cut-off suggested by Babor et al. (6).

Several studies have examined the psychometric properties of the AUDIT for detection of individuals with Alcohol Use Disorders with a range of 5 in Malaysian population to 24 in North India (20). The result from India was similar to that in the present study; the AUDIT optimal cut-off score was higher than WHO recommendations of hazardous drinking and higher than the findings of other studies (7, 8, 19). Pal et al. found 24 with 69% of sensitivity and 87% of specificity for alcohol dependency (21).

CONCLUSION

This is one of the first studies on alcohol use in recent years in Iran on a psychiatric population. The findings suggest that the AUDIT cut-off scores should be tailored according to Iranian drinking culture. The AUDIT score for screening harmful use in the sample appears to be higher than those previously reported by WHO for hazardous drinking. The benefits of such high cut-offs for screening subjects are evident, but it may increase the chance of losing positive cases.

LIMITATION

This research was carried out at a medical center in Tehran. The study sample included a small number of female alcohol dependents; so, we were not able to calculate separate cut-off points for genders. Future studies should increase the female sample size.

Conflict of interests: None to be declared.

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