



## Psychometric properties of the AUDIT among men in Goa, India



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### ABSTRACT

**Aims:** The Alcohol Use Disorders Identification Test (AUDIT) is a 10-item screening questionnaire used to detect alcohol use disorders. The AUDIT has been validated in only two studies in India and although it has been previously used in Goa, India, it has yet to be validated in that setting. In this paper, we aim to report data on the validity of the AUDIT for the screening of AUDs among men in Goa, India.

**Methods:** Concurrent and convergent validity of the AUDIT were assessed against the Mini International Neuropsychiatric Interview (MINI) and World Health Organisation Disability Assessment Scale (WHODAS) for alcohol abuse, alcohol dependence, and functional status respectively through the secondary analysis of data from a community cohort of men from Goa, India.

**Results:** The AUDIT showed high internal reliability and acceptable criterion validity with adequate psychometric properties for the detection of alcohol abuse and dependence. However, all of the optimal cut-off points from ROC analyses were lower than the WHO recommended for identification of risk of all AUDs, with a score of 6–12 detecting alcohol abuse and 13 and higher alcohol dependence.

**Conclusions:** In order to optimize the utility of the AUDIT, a lowered cut-off point for alcohol abuse and dependence is recommended for Goa, India. Further validation studies for the AUDIT should be conducted for continued validation of the tool in other parts of India.

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## 1. Introduction

Alcohol Use Disorders (AUD) encompass a range of conditions related to excessive alcohol consumption and is recognized by the World Health Organisation (WHO) as a unique disorder: with hazardous, harmful, and dependent drinking comprising the progressively more serious forms of the disorder (Reid et al., 1999). AUDs account for a significant global burden of disease, injury, economic and social cost (Rehm et al., 2009; WHO and Team, 2014). The large societal cost of AUDs is not limited to healthcare costs, but also include unmeasured costs related to social harm, loss of productivity and direct law enforcement costs. Due to the large societal cost and burden of AUDs globally, appropriate screening tools are required to properly identified AUDs. Screening tools are particularly useful in low resource settings where efficiency is required in time and human resources when it comes to the detection of health problems.

The Alcohol Use Disorders Identification Test (AUDIT), developed by the WHO for the early detection of hazardous and harmful alcohol consumption, is one of the most widely used screening tools for the detection of AUD (Saunders et al., 1993). It is also able to detect patients with alcohol dependence, making it a more versatile and useful screening tool compared to the 4-item CAGE questionnaire (Ewing, 1984), and the 25-item Michigan Alcoholism Screening Test (Selzer, 1971). Whilst acknowledging the cross-national standardization of the AUDIT as a notable strength in the field of cross-cultural psychiatry, we identify with the argument by Altman and Bland that a tool is only valid in the setting in which it is valid (Altman and Bland, 1994).

The AUDIT has been previously validated in only two settings in India; a community-based sample in North India (Pal et al., 2004) and a clinic sample in Bangalore (Carey et al., 2003). However, we identify important concerns with the previous validation studies (Table 1). In the community study the criterion measure was not a diagnostic tool, but another screening tool, Short Michigan Alcoholism Screening Test (SMAST) (Pal et al., 2004). Further to this, in an attempt to increase the psychometric properties of the AUDIT, the authors have only selected participants with hazardous drinking (identified as AUDIT score 8 and above), thereby limiting

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**Table 1**  
Validation studies of the AUDIT in India.

Study	Key psychometrics	Sample	Gold standard criterion	Suggested cut-off scores
Pal et al. (2004)	Internal consistency Interscale correlations Sensitivity (Abuse: 85.3, Dependence: 69.4) Specificity (Abuse: 89.4, Dependence: 87.5) ROC Analysis (AUC = 0.883)	Community outreach sample (n = 200) and de-addiction center sample (n = 97)	Short Michigan Alcoholism Screening Test (13 item questionnaire differentiating between borderline harmful drinking and potential alcohol abuse)	Alcohol Abuse: 16 Alcohol Dependence: 24
Carey et al. (2003)	Feasibility Factor structure Reliability (alpha = 0.94) Validity Utility	Admissions to Psychiatric Hospital in Bangalore (n = 1349)	Clinician diagnosis at discharge, no gold standard criterion	Not applicable

the generalizability of the validated AUDIT, and more importantly defeating the purpose of cross-cultural adaptation of tools, where it is likely that previously ascertained cut-offs may perform differently in different cultural settings. In the clinic based study, apart from the fact that there was no gold standard criterion, we argue that validity studies from high prevalence settings may not generalize to the community as the process of seeking healthcare, the interaction with clinicians, and relatively high proportions of more severe disorders may all lead to bias (Carey et al., 2003). To our knowledge the AUDIT has not been previously validated against an established gold standard measure in a community-based population anywhere in India.

The aim of this study was to determine the criterion and concurrent validity, scale reliability and psychometric properties of the local language (Konkani) version of the AUDIT for the screening of AUDs among men in Goa, India. Despite the sample consisting of only men, the unique context surrounding alcohol use within India justifies this homogeneity, as abstinence rates are high in women, due to the confluence of strong cultural and taboo factors (Benegal, 2005; Rehm et al., 2009).

## 2. Methods

### 2.1. Setting

This sub-study is a part of a large community-based cross-sectional study conducted in Goa, which has a population of just over 1.4 million, 62% of whom live in urban areas (Chandramouli and India. Office of the Registrar General & Census Commissioner., 2011).

### 2.2. Participants and follow up procedures

Participants were adults aged 18–49 years and residing in the following study sites between 2006 and 2008 (baseline survey), and who completed a follow-up survey 6–8 years later: urban (two beach areas popular among tourists and one typical commercial and residential area) and rural areas (six contiguous villages) of Northern Goa (Pillai et al., 2013). A two-stage probability sampling procedure, based on electoral rolls, was employed to determine the population-based sample. The participants were selected at random from those with eligible ages within the randomly selected households. Refusal rates for randomly selected households were 1.5%.

At a follow-up from September 2012 to September 2014, a range of self-reported outcomes were measured on the baseline cohort,

including AUDIT, MINI, and WHODAS. All consenting participants were administered the self-report questionnaire by trained research workers. The research workers were blind to any AUD status gathered from baseline, and the data analyzed here was taken only from the follow-up measurements. Quality control was conducted by re-interviewing 10% randomly selected participants by the research coordinator and random visits by the research coordinator to directly observe the research workers.

### 2.3. Ethics

Ethical approval was obtained from the Sangath Institutional Review Board (IRB), Ethics Committee of the London School of Hygiene and Tropical Medicine (LSHTM) and the Indian Council of Medical Research. Each research worker completed the NIH Protecting Human Research Participant online course. Participants diagnosed with AUD or Common Mental Disorder (CMD defined as depressive and anxiety disorders) were offered further free clinical assessment and treatment by a psychiatrist.

### 2.4. Assessments

#### 2.4.1. Gold standard criterion measure

**2.4.1.1. MINI.** The Mini International Neuropsychiatric Interview (MINI) was used to identify current alcohol abuse and alcohol dependence (Lecrubier et al., 1997). The MINI is a short diagnostic structured interview to explore 17 disorders according to Diagnostic and Statistical Manual IV-TR diagnostic criteria. It allows for administration by non-specialized interviewers. Interviews were conducted using paper and pencil with diagnosis assessed following a structured algorithm. Automatic exclusion of a diagnosis of alcohol abuse or dependence was made if the respondent answered no to the question “In the past 12 months, have you had 3 or more alcoholic drinks within a 3 hour period on 3 or more occasions?” Alcohol abuse was diagnosed if a positive response was given to any one of four questions regarding alcohol consumption; alcohol dependence was diagnosed if a positive response was given to any three of seven questions regarding alcohol consumption.

#### 2.4.2. Concurrent validity measure

**2.4.2.1. WHODAS.** The WHO Disability Assessment Schedule (WHODAS) is a 12-item questionnaire for measuring functional

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