

Convergent Validity of Self-Administered Addiction Severity Index in a Sample of Nigerian Patients in a Residential Treatment Facility

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Abstract

Background: Substance use disorders present with multiple drug-related problems that need to be evaluated with a view to planning and administering holistic interventions that could potentially improve addiction treatment outcomes. Many valid instruments are available for assessing the problems that occur in addiction but most of them require some training and they take a lot of time to administer. This study validates a shorter self-administered version of the Addiction severity Index (ASI) against the Clinician-administered ASI with a view to cutting the time needed to administer the instrument. **Methods:** The study recruited 142 patients in a residential treatment center. Correlation coefficient and t-test were used to assess for the convergence of the two version. **Results:** The correlation coefficients ranged from 0.52 to 0.97 for the different domain of the ASI with higher endorsement of problems in the self-administered than clinician administered version in most domains. **Conclusion:** The self-administered ASI is a valid alternative to the clinician-administered ASI and it saves valuable time especially in resource-constrained settings.

Keywords: Addiction severity index, convergent validity, Nigeria, residential treatment facility, self-administered

INTRODUCTION

The use of psychoactive substances is a ubiquitous problem globally with alcohol and substance use disorders accounting for over 20 per cent of Disability Adjusted Live Years caused by mental and substance use disorders, next only to depressive and anxiety disorders.¹ Substance use disorders are common problems in Nigeria, and the most commonly used substances include alcohol, cannabis, tobacco, and sedatives.²⁻⁴ A hospital-based study in northeast Nigeria suggests that tramadol is also commonly abused with up to about 50% of patients using it.⁵

Substance use disorders are chronic and relapsing conditions because of which patients with addiction may develop various complications and problems that require comprehensive evaluation and assessment.^{6,7} Medical problems affecting many organ systems as well as psychiatric disorders have been documented among patients with substance use disorders.⁸⁻¹¹ Patients with these disorders have problems in

various areas including physical and mental health, legal and employment domains that are associated with drug and alcohol abuse. Evaluating patients for these problems is an invaluable aspect of addiction treatment that allows for various domains of problems to be elicited with a view to giving patients a holistic treatment. Indeed evidence is unequivocal in suggesting that identifying, evaluating, and attending to these myriad problems improve the outcomes of addiction treatment.^{12,13}

A number of instruments are currently in use for the evaluation of patients with substance abuse such as Addiction

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Severity Index (ASI),¹⁴⁻¹⁶ Global Appraisal of Individual Needs,¹⁷ and Maudsley Addiction Profile.¹⁸ The ASI is the most widely used worldwide for treatment planning and outcome evaluation. It is a clinician-administered (CA) multidomain instrument consisting of seven domains (legal status, family/social status, drug use, alcohol use, medical status, psychiatric status, and employment status). It has been validated in different languages and it is being used in addiction treatment in many countries of the world including Nigeria.¹⁹⁻²²

Other formats of the ASI, which include the self-report form and the computer-based or telephone-based interactive voice response, have been validated as alternatives to the CA ASI.^{23,24} The CAASI, although very useful in the evaluation of patients with substance use disorders, has a number of limitations. For instance, it takes about 45–60 min to administer the interview and another 10–15 min to score which is often time that is unavailable given the number of patients seeking addiction treatment and relative dearth of mental health work force. The CA ASI also provides for and requires copious documentation of information and notes elicited under each domain of the instrument during the interview. While this provides for a rich understanding of the patient's problems it is potentially time-consuming especially in resource-poor settings such as Nigeria. The paucity of mental health workforce has been documented extensively, especially in scarce-resource settings of low- and middle-income countries like Nigeria.²⁵⁻²⁸ There is also the issue of the need for adequate training to administer the CA ASI interview which is obviously a requirement that would be obviated by the use of a self-administered (SA) instrument. Furthermore, although some evidence seem to suggest that computer-assisted forms of self-report are often better than paper-and-pencil questionnaires, there is a tendency, nonetheless, for patients to readily report drug and alcohol use and related problems in SA formats because of the anonymity and confidentiality it provides compared with one-to-one interviews as in the case of CA ASI.²⁹⁻³¹

Given this problem with CA ASI and the advantages of the SA ASI, it becomes pertinent to validate the latter which takes much shorter time to answer. The automated telephone or internet-based ASI, although self-report instruments, are associated with the potential limitation of lack of internet or other digital infrastructures in low resource settings making a pencil-and-paper form more suitable. The SA ASI was developed based on the CAASI.^{24,32} It has similar domains but with fewer items than the CAASI and with some modifications in the reporting of the problems in some domains such as reporting in a dichotomous yes or no answers instead of number of days a problem was experienced. The self SA ASI allows for structured assessment and evaluation of the multifaceted problems that patients with addiction have.

This study's main aim was to validate the SA format of ASI against the established CA ASI.

MATERIALS AND METHODS

Study sample

The study sample consisted of 142 participants who were admitted into the residential drug abuse treatment facility of a federal tertiary hospital in northeastern Nigeria. The hospital has drug detoxification unit that constitutes the first phase of treatment and an intensive rehabilitation ward where biopsychosocial interventions are instituted. Successive inpatients were recruited for the study if they (1) gave informed consent, (2) were 18 years and older, (3) could read and write in English, and (4) conscious and alert and otherwise cognitively stable enough to interact in the interview and respond to the self-report questionnaire. Ethical clearance from the research ethics committee of the Federal Neuropsychiatric hospital Maiduguri was obtained, and all participants gave informed consent.

Procedure

After informed consent procedures and participants were deemed to meet inclusion criteria, a sociodemographic questionnaire was given to all participants to elicit demographic data. A random allocation of the form of questionnaire to be given first was made by a simple balloting where participants blindly picked a folded piece of paper out of an envelope from many pieces that were labeled "S" for self-report and "I" for interview format. The "S" group received the SA ASI first followed by the CA ASI version. The reverse order was followed for the "I" group. The time between administering the two formats was between 6–24 h. This was based on a similar study by Rosen *et al.* (2000) The CA ASI interviews were conducted by a senior registrar in psychiatry who has had training in the use of ASI and has many years' experience using ASI as part of the preintake evaluation of patients into the drug rehabilitation stage (Phase 2) of addiction treatment. Composite scores were used to compare the two versions of the ASI. To arrive at the composite score, a weighting procedure is usually done, and each composite score is the sum of answers to several questions within an ASI problem area or domain. The developers of the instrument argued that since there was no evidence to suggest that one item should not count more than any other one in the determination of the composite scores, they intended to give equal weighting to all questions in the composite scores. However, there is a great variability in the range of possible answers to the question in each composite and that would not result in equal contribution of questions to the composite score of a domain or problem area. For instance, in a case where a question having a maximum answer of 4 (i.e. a patient rating scale) is combined with a question with a maximum answer of 20,000 (i.e. how much money have you earned in the past 30 days?), there would be a glaring inequality in the contribution to the composite score of the different questions. To correct this, each composite was adjusted for the answer range of each item and for the total number of items in the composite. This is done mathematically through two division steps. For example, the composite score on the medical problem area is composed of three ASI items:

A. How many days have you experienced medical problems in the last 30 days?

Maximum value = 30.

B. How troubled or bothered have you been by your medical problems in the past 30 days? Maximum value = 4 (Rating).

C. How important to you now is treatment for these medical problems?

Maximum value = 4 (Rating).

Each question is divided by the value of the maximum answer and the total number of the items (questions) in the domain or problem area.

Therefore, to compute the medical composite score of a hypothetical patient who has had medical problems for 20 days in the past 30 days ($A = 20$), considerably bothered by the medical problems ($B = 3$), and extremely in need of treatment for the problems ($C = 4$). The medical composite score = $20/30 \times 3 + 3/4 \times 3 + 4/4 \times 3 = 0.22 + 0.25 + 0.33 = 0.8$.

The composite scores range from 0 to 1 with higher values approaching 1 indicating higher problems and vice versa. The composite score for this hypothetical case would suggest a high level of medical problems. The same mathematical computations go for the calculation of the composite scores of the other domains with the exception of the employment/support domain. In the employment domain, the score obtained is subtracted from 1 to give the final composite score. This is because the questions in the domain are measures of assets, resources, and support base of the patient, and a higher score on this domain is actually showing less problems, which would be inconsistent with the composite scores in other domains where the higher the scores, the higher the problem in the domain.

Data analysis

Descriptive statistics were used to summarize sociodemographic data. To assess the convergent validity of the SAASI with CA ASI, correlations of the composite scores across the seven domains were used. Paired Student's *t*-test was also used to assess if there was any statistically significant difference in the mean composite scores across the domains of the two versions of the ASI. The statistics was set at 95% confidence interval (95%), $P < 0.05$, two-tailed.

RESULTS

Sociodemographic profile of respondents

Of the total sample of 142 participants, males were 96.5% and Muslims were 84.5% with an average age of 31 years (standard deviation = 8, range = 18–54). Most of the participants (92.3%) had secondary school or higher education. Ninety-four (66.2%) were married and 31.7% were of the Kanuri ethnic group. Table 1 details the sociodemographic characteristics of the participants.

Table 1: Sociodemographic profile of the study participants (n=142)

Variables	Frequency, n (%)
Gender	
Female	5 (3.5)
Male	137 (96.5)
Religion	
Christians	22 (15.5)
Muslim	120 (84.5)
Ethnicity	
Shuwa-arab	11 (7.7)
Hausa	14 (9.9)
Kanuri	45 (31.7)
Fulani	8 (5.6)
Marghi	11 (7.7)
Babur	28 (19.7)
Yoruba	2 (1.4)
Kare-kare	13 (9.2)
Igbo	5 (3.5)
Other	5 (3.5)
Education completed	
Primary	11 (7.7)
Secondary	66 (46.5)
Postsecondary	32 (22.5)
First stage tertiary	33 (23.2)
Marital status	
Married	42 (29.6)
Separated	2 (1.4)
Divorced	4 (2.8)
Never married	94 (66.2)
Occupation	
Armed forces	9 (6.3)
Professionals	8 (5.6)
Technicians	24 (16.9)
Clerks	9 (6.3)
Services/sales	5 (3.5)
Skilled agricultural, workers	1 (0.7)
Crafts and trades	18 (12.7)
Plant operators	17 (12.0)
Elementary occupation	19 (13.4)
Unemployed	32 (22.5)

Table 2: Mean composite scores of the two versions of Addiction Severity Index with their correlation coefficients and mean differences with corresponding P values

ASI domain	SA ASI	CA ASI	r (P)	MD (P)
Medical	0.19	0.16	0.760 (0.000)	-0.03 (0.022)
Employment	0.29	0.25	0.966 (0.000)	-0.04 (0.000)
Alcohol use	0.13	0.12	0.899 (0.000)	-0.01 (0.220)
Drug use	0.29	0.22	0.691 (0.000)	-0.08 (0.000)
Family/social	0.11	0.12	0.519 (0.000)	+0.01 (0.427)
Psychological	0.28	0.17	0.898 (0.000)	-0.11 (0.000)

ASI – Addiction Severity Index; SA – Self-administered; CA – Clinician administered; MD – Mean Difference of composite scores

Convergent validity of self-administered Addiction Severity Index

Table 2 shows the details of the mean composite scores and correlation between CA ASI and SA ASI. Composite scores from SA and CA ASI correlated 0.52–0.97 for all the domains with the exception of the legal domain in which none of the respondents endorsed any problems let alone need for any assistance. The medical domain's composite scores correlated 0.76 across the two formats with a significantly higher mean composite scores in SA ASI than CA ASI (0.19 vs. 0.16, $P < 0.05$). The composite scores for the two formats of the ASI were strongly correlated ($r = 0.97$) for employment status. The SA mean employment composite scores were significantly higher than the interviewer-administered ASI (0.29 vs. 0.25, $P < 0.05$).

The composite score for the drug use domain correlated 0.69 across the two formats of the ASI, and the SA ASI had significantly higher mean composite scores than the CA ASI (0.29 vs. 0.22, $P < 0.05$). Alcohol use domain had high correlation ($r = 0.89$) between the two formats, and the SA had a slightly higher mean composite score than the CA ASI, but the difference was not statistically significant (0.13 vs. 0.12, $P = 0.22$).

Across both formats of the ASI, the mean composite scores for the psychological problems correlated highly ($r = 0.89$) with a statistically significantly higher mean scores on the SA ASI (0.28 vs. 0.17, $P < 0.05$). The family/social domain was moderately correlated ($r = 0.52$) across the two versions. There was a slight difference between the mean composite scores of the two formats in favor of the CA ASI that was, however, not significant (0.12 vs. 0.11, $P = 0.43$).

DISCUSSION

The mean composite scores of the different domains of the two formats of the ASI show a good enough correlation for the SA ASI to serve as an alternative to the CA ASI. The correlations ranged from 0.52 to 0.97. The employment status had the highest correlation while the family/social domain had the lowest. These correlations are for all the seven domains save the legal domain in which the participants endorsed no problem whatsoever.

These findings of positive correlation between the two formats of the ASI are in keeping with the earlier studies^{24,32} that found similar results of positive correlation in the two versions. There was also a significantly higher mean composite scores for the SA ASI than the CA ASI across all the domains except the family/social domain in which the CA ASI had a higher, albeit insignificant, composite score than the SA ASI version. This is also consistent with the findings of study by Rosen *et al.*²⁴ which found a higher endorsement problems across many domains by the SA ASI than the CA ASI. This is probably because of the anonymity and privacy that a SA instrument provides which perhaps allows patients to express their problems without

any inhibitions that may be engendered by a face-to-face interview. Indeed, evidence already supports this notion of people being more likely to express their problems in a self-report instrument than in an interview.²⁹⁻³¹ Our study however found a slightly higher (but nonsignificant) endorsement of family problems with the interview than the self-report version which is at variance with the Rosen *et al.*'s study.

All the study participants endorsed neither a legal problem nor a need for any legal help. The legal problem in ASI is defined as having been arrested and charged to court for a list of civil and criminal offenses. These negative responses in the legal domain could be as a result of the nature of judicial system and law enforcement practices in Nigeria. The National Drug Law Enforcement Agency has the mandate of reducing drugs demand and supply and mitigating the criminal activities associated with drug abuse. They are however more likely to focus their attention on drug dealers, especially dealers of such so-called "hard drugs" as cocaine, amphetamines, and heroine, most of whom are hardly found in the patient population. In addition, police officers may arrest drug users on charges of using illicit drugs or for drug-related offences such as thefts or assault; but most times, the offenders do not get to courts of law for prosecution. This however is probably not the case as the respondents did not even admit to being arrested for drug use, possession, or drug-related offense perhaps because they may not be fully convinced that divulging such information would be without any consequences.

The concurrence of the SA ASI with the CA ASI has such policy implications as the need for the inclusion and routine use of the SA ASI in all addiction facilities especially in resource-poor settings of sub-Saharan Africa. Additional research is, however, needed to further replicate this study among patients with addiction in different settings such as outpatient treatment facilities.

CONCLUSION

This study adds to the existing evidence for the validity of the SA ASI as an instrument suitable for evaluation of the multidomain problem of patients with drug abuse. It can be administered to patients who can read and write to quickly capture data on their multidomain problems, thereby obviating the need for often unavailable trained interviewers and saves valuable time. Obtaining such data on the problems that patients with addiction have invariable help in treatment planning to tackle their most pressing issues allowing them to present themselves fully for the addiction treatment.

Limitations of the study

The study was conducted among inpatients with drug abuse who probably have a more severe addiction than their outpatient counterparts. This would probably limit generalizing the study to all categories of addiction patients. Language is an obvious limitation as the SA ASI was administered in English. Although all the participants in the study were literate enough

to respond to the SA ASI in English, future studies should consider translating the SAASI into local languages to increase the number of participants that can read and write in their local languages who are unable to read in English. Further, being a SA instrument, the SAASI might not be administrable to some proportion of the population in northern Nigeria even when translated to local languages as the literacy level in this part of the country is below the national average.

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Conflicts of interest

There are no conflicts of interest.

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