

The role of substance assessment tools in treatment planning and monitoring: a narrative review

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Abstract Psychoactive drugs including alcohol and tobacco products can be considered as substances that lead to various negative physical and psychological consequences. On the other hand, socioeconomic deterioration also comes along with harmful substance usage. Substance addiction is a complex condition characterised by a compulsive and harmful pattern of substance use despite the adverse consequences it may comprise, and the risk of developing substance addiction is influenced by a combination of genetic, environmental, and psychological factors and relapse is the recurrence of substance use after a period of abstinence or successful treatment. Hence, healthcare professionals, educational experts, and legal officers are required to get a broader idea regarding the factors associated with substance use. Assessment tools are the most efficient way of identifying the associated factors of substance use, customising specific treatment plans, and monitoring the progress of addiction intervention. By implementing modifications and enhancements to the pre-existing tools, researchers and clinicians able to improve the accuracy of participant responses and findings, leading to a more precise identification of causal links within the context of substance use disorders. The primary focus of this study lies in the comprehensive review of the Alcohol Use Disorder Identification test, Michigan Alcohol Screening Test, Alcohol Dependency Scale, Self-administered Alcoholism Screening Test, Drug Abuse Screening Test, Tobacco, Alcohol, Prescription Medication, and Other Substance Use Tool, Alcohol, Smoking, and Substance Involvement Screening Test, Substance and Choice Scale, Screening to Brief Intervention, Adolescent Alcohol and Drug Involvement Scale, and Severity of Dependence Scale play crucial roles in identifying substance use disorders, assessing severity, guiding treatment decisions, and facilitating interventions to promote recovery and well-being.

Keywords: Assessment tools, Clinical applicability, Reliability Substance, Validity

Introduction

Both legal and illegal drugs including alcoholic beverages fall under substances that are causing various issues in human lives. Depending on the frequency level of alcohol use, individuals' resilience to the intoxication will be decreased (Dumain, 2022). As per the 0.5% to 42.8% (v/v) alcohol concentration, the intoxication mechanism is activated inside the body (Jain and De, 2019). Apart from that, heroin, cocaine, Marijuana, opioids, and other addictive prescription medications such as Amphetamine, Benzodiazepines and Barbiturates can be considered addictive substances (Pottle, 2023). The long-term usage of substances will affect individuals' central nervous system and damage the liver (Kalant, 2010).

The addictive properties of substances (Compton and Volkow, 2006) have affected the brain reward system and dysregulated the normal dopamine function (Sherer, 2016; Thennakoon, 2024). A study conducted by Roba et al. (2019), revealed that 52.5% of the sampled students, encompassing both secondary school and university students, were identified as lifetime substance users in Ethiopia. Specifically, the analysis disclosed that 46.2% of students had a history of alcohol use, 24.7% had engaged in the use of Khat, and 14.7% had reported using cigarettes. A cohort study conducted at Khartoum State University in Sudan highlights that the susceptibility of young individuals to consume substances is attributed to curiosity and psychosocial issues (Osman et al., 2016).



Kamaladshan et al. (2018) conducted a cross-sectional study on the factors associated with substance abuse among A/L students in the Nallur educational division in Sri Lanka. The study found that 14.4% of students experienced sleep disturbances, 22.8% faced relationship failures, 40.9% were driven by curiosity, 27% sought to reduce shyness, and 75% were prone to using substances to seek pleasure. The National Dangerous Drugs Control Board [NDDCB], (2023) denoted a substantial prevalence of cannabis and heroin-related offenses in Sri Lanka in 2022. Further, a majority (59%) of them reported from the Western Province, and due to outcomes of a recent study, 36.5% of substance-using Advanced Level students were reported in Western Province (Thennakoon et al., 2023). Hence, the advantage of the current study is to reveal the various substance assessment tools that are essential to get more effective insights into the negative consequences of substance use.

Methodology

Articles were gathered using Google Scholar, PubMed and Elsevier data bases. As per the validity and reliability often using tools were filtered to construct this review.

Results

Alcohol Use Disorder Identification Test (AUDIT)

The alcohol use disorder identification test is an oral or written interview test that has been developed by the World Health Organization to identify alcohol dependence and harmful and hazardous drinking patterns of alcohol (De Meneses-Gaya et al., 2009). This test includes 10 items regarding recent alcohol usage, symptoms of alcohol dependence, and alcohol-related issues where the participation rate is from 0 to 4 (Shevlin and Smith, 2007). According to the total score, four different risk zones included as follows: 1st low-risk level (0-3), 2nd risky level (4-9), 3rd harmful level (10- 13), and 4th severe level (14+). After getting the response level, relevant management methods are also included in the manual of this test. This test has been cross-validated among six countries namely Norway, Australia, Kenya, Bulgaria, Mexico, and the United States (Lawford et al., 2012). As per the sensitivity

of AUDIT, the countries that have been priorly used to analyse the validity denoted that AUDIT can be used to correctly identify individuals who exactly have alcohol-related problems or alcohol use disorder (Lundin et al., 2015). This tool measures the proportion of true positive cases correctly identified by the test and high sensitivity indicates that the test has a low rate of false negatives, meaning it effectively captures most cases of alcohol-related issues. Further, this measures the ability of the AUDIT to correctly identify individuals who do not have alcohol-related problems or alcohol use disorder. It indicates the proportion of true negative cases correctly identified by the test (Higgins-Biddle and Babor, 2018).

Michigan Alcohol Screening Test (MAST)

This is a structured interview-type quantifiable instrument developed by Selzer in 1971 to detect alcohol-dependent drinkers (Martin et al., 1990). The self-centred, social, occupational, and family problems related to heavy drinking were mainly focused on this questionnaire. This questionnaire comprises 25 items and responses need to be stated saying “Yes or No” (Selzer, 1971). It takes approximately ten minutes to complete this test. Subsequently, the test was modified into a brief version of the Michigan Alcohol Screening Test (MAST) including 10 items that are reliable in both clinical and non-clinical settings (Levine et al., 2005). Furthermore, healthcare professionals, researchers, and counsellors employ this tool to identify individuals who may require further assessment or intervention for alcohol-related problems. Depending on the obtained score, an individual may be referred for a more comprehensive evaluation to determine the extent of their alcohol use and whether they need treatment or support (Laux et al., 2004). Evoking the overall advantages of this tool, The MAST provides a standardized method for assessing alcohol-related problems, making it easier for clinicians to evaluate and compare results, and it can be quickly administered, which is beneficial for both clinicians and patients (Minnich et al., 2018). Moreover, the test consists of a set of structured questions that cover various aspects of alcohol consumption, enabling clinicians to gather comprehensive information about a patient's drinking habits and

aids identify individuals at risk for alcohol-related problems early on, facilitating interventions and preventive measures to address potential issues before they escalate (Greenberg and Naegle, 2012).

Denoting the disadvantage of this test, The MAST primarily focuses on alcohol-related problems and may not adequately assess other substance abuse issues or underlying mental health conditions. On the other hand, the questions in the MAST may not be culturally sensitive or relevant to certain populations, potentially leading to inaccurate assessments for individuals from diverse cultural backgrounds (Levine et al., 2005). Unlike some other assessment tools, the MAST does not provide a severity grading for alcohol-related problems, which could limit its usefulness in determining the level of intervention needed (Laux et al., 2004).

Alcohol Dependency Scale (ADS)

The alcohol dependency tool has been developed to assess the severity of alcohol dependency to meet the Diagnostic Statistical Manual of Mental Disorders (DSM) IV criteria for alcohol use disorders. This is a 25-item self-administered questionnaire that has rated 0 to 47. Individuals who are not presenting alcohol dependency indicate zero scores in the questionnaire. The reliability of the questionnaire has been indicated as a good score ($\alpha = 0.81$) according to the internal consistency value (Mejldal et al., 2019). This scale has been analysed by a three-factor model including loss of behavioural control and heavy drinking, Obsessive-Compulsive drinking style, Psychoperceptual and psychophysical withdrawal (Doyle and Donovan, 2009). The ADS provides a structured format for evaluating alcohol dependence, allowing for consistent assessment across different individuals and settings and offers a numerical score that quantifies the severity of alcohol dependence, enabling clinicians and researchers to track changes over time and compare across populations (Kahler et al., 2003; Doyle & Donovan, 2009). On the other hand, the ADS also relies on self-reporting, which can be subject to biases such as social desirability or recall errors. Additionally, this tool may not be equally valid or reliable across different cultural or linguistic groups, necessitating caution in its application in diverse populations (Kahler et al., 2003).

Self-administered alcoholism screening test (SAAST)

To distinguish alcoholism in the general population, 37 items included a self-administered alcoholism screening test that has been developed as a modification of the MAST (Davis et al., 1989). It takes 10 minutes to administer. According to the scoring system, six or less than six indicates an absence of significant drinking problems, 7 to 9 indicates possible alcoholism, and 10 or more than 10 indicates problematic alcoholism. Vickers-Douglas et al. (2005) conducted a study that revealed a 0.94 Cronbach alpha value for the reliability of SAAST and after reconsidering the DSM IV criteria on alcoholism and alcohol dependence items of the SAAST has been revised and re-established the 31-item revised version of SAAST. This test can be easily administered by individuals without the need for professional training, making it accessible for self-assessment and the results are typically obtained immediately after completing the test, allowing individuals to promptly assess their alcohol use patterns (Smith and Pristach, 1990). Despite the SAAST being widely used, it may not have undergone rigorous validation in all populations or settings, raising concerns about its reliability and validity. Further, it may not provide sufficient guidance or support for individuals who screen positive for problematic alcohol use, potentially delaying or hindering access to appropriate interventions or treatment (Davis and Morse, 1991).

Drug Abuse Screening Test (DAST)

This test has been designed to measure various categories of prescribed, over-the-counter drugs or any nonmedical drugs excluding alcoholic beverages that are mainly used for clinical screening and evaluate the treatment progress. Measurement properties have been evaluated by using clinical substance abuse clients and 0.92 of substantial internal consistency reliability has been indicated (Skinner, 1982). Initially, the test consisted of 28 items but has since evolved into a 10-item tool. Respondents can provide answers based on their experiences, choosing between “Yes” or “No”. Most healthcare professionals are using this to quickly screen individuals for potential drug-related issues (Skinner, 1982). Thus, DAST

can help identify individuals who may have a substance abuse problem or who are at risk of developing one. Early detection can lead to timely interventions and treatment. Whereas, while the DAST assesses a range of substances, including alcohol, marijuana, and illicit drugs, it may not capture all types of substance abuse or dependence. For example, it may not adequately assess for the abuse of prescription medications or specific substances that are less commonly used. The DAST is a screening tool and is not intended to provide a diagnosis of substance abuse or dependence. Further assessment by a qualified healthcare professional is typically needed to confirm a diagnosis and determine appropriate treatment. Concomitantly, this may not be culturally sensitive or appropriate for individuals from diverse cultural backgrounds or those who speak languages other than the one in which the assessment is administered. This could lead to misunderstandings or misinterpretations of the questions and responses.

Tobacco, Alcohol, Prescription Medication, and other Substance Use (TAPS) tool

TAPS is a self-administer interview tool that is used to assess the risk level of tobacco, alcohol, illicit drugs, and inappropriate utilisation of prescription medicines. This tool is derived from WHO established ASSIS Tool (Carter et al., 2022). The initial phase of the screening tool internalises four items that are accessing severity level of a particular substance usage during the past 12 months. Scores of the tool have been categorised as 0 as no use in past months, 1 as problem use, and 2+ as a higher risk of substance use. If a responder gives a positive response for TAPS 1, a further a brief assessment (TAPS 2) will be administered regarding the past 3 months' substance-related problems (McNeely et al., 2016). This tool offers a standardised framework for evaluating substance use, which can help healthcare professionals make consistent and reliable assessments across different patients (Carter et al., 2022). By systematically assessing substance use, TAPS may help in the early detection of problematic patterns of use or dependence, enabling timely intervention and treatment. Especially, TAPS can be used in research settings to gather data on substance use trends, prevalence rates, and treatment outcomes, helping

to inform public health policies and interventions. In contrast, While TAPS covers a range of substances, it may not capture all relevant substances or emerging trends in substance use, potentially leading to incomplete assessments and this may be lengthy and complex, requiring trained professionals to administer and interpret accurately (McNeely et al., 2016). As per cultural sensitivity, this tool may not adequately account for cultural differences in substance use patterns and norms, potentially leading to misinterpretation of responses or inaccurate assessments (Recovery Village, 2023).

Alcohol, Smoking, and Substance Involvement Screening Test (ASSIST)

This tool has been developed by the World Health Organization to identify problematic substance usage and to determine a suitable intervention method for them. ASSIST is a substance screening tool that includes 8 items, and 5 to 10 minutes will be taken to complete (Ali et al., 2002). In this tool, the risk level is assessed regarding 10 different categories of substances (tobacco products, alcohol, cannabis, amphetamine, inhalants, sedatives or sleeping pills, hallucinogens, opioids, and others). Tiburcio et al. (2016) researched to find the validity and reliability of this test which has indicated sufficient reliability, such as tobacco ($\alpha = 0.83$), alcohol ($\alpha = 0.76$), and marijuana ($\alpha = 0.73$). According to test-retest reliability coefficient values, items have indicated the highest kappa across the selected substances Q 2 ($k = 0.76$), Q 3 ($k = 0.73$), and average kappa ranged from 0.90 to 0.58. After getting the scores for this questionnaire Q2 to Q7 scores need to be calculated and categorised as (0 – 3) lower Risk, (4-26) Moderate Risk, and (27+) High Risk of each substance usage except from alcohol. The scale has rated the risk level of alcohol as 0 to 10 Lower Risk, 11 to 26 Moderate Risk, and 27+ High Risk. According to the interpretation of the scores, individuals were rated lower risk, moderate risk, and high risk of substance involvement (Friso et al., 2021). If an individual obtains a moderate score there is a tendency to encounter various health problems including dependency in the future. If an individual obtains a high score on this questionnaire there is a high tendency to experience substance dependency including various health, relationship, social,

financial, and legal issues related to substance involvement (WHO, 2010).

Substance and Choices Scale (SACS)

The substance and choices scale is mainly designed to assess the various health issues about alcohol and other drugs among young populations all around the world (Queensland Health, 2023). This paper-pencil test takes approximately five minutes to administer, and the questionnaire is mainly designed to focus on the aged 13 to 18 population. Two different clinical and community versions are essential to differentiate the issues easily. The questionnaire was divided into three sections. Twelve items were allocated to the first section, ten items were allocated to the second section and two items were allocated to the third section in this questionnaire. The reliability of the questionnaire has indicated a good score ($\alpha = 0.91$) (Christie et al., 2007). This scale provides a comprehensive assessment of substance use behaviour, including frequency, quantity, and consequences of use (Queensland Health, 2023). Thus, results of the scale aid interventions and treatment plans based on the specific needs and patterns of substance use identified. Conversely, SACS may not cover all aspects of substance use behaviours or factors influencing decision-making, potentially missing important shades of meaning (Saunders et al., 2023). However, the scale may not fully account for cultural differences in substance use behaviours and decision-making. Depending on the length and format of the scale, respondents may experience fatigue or frustration, leading to incomplete or inaccurate responses (Christie et al., 2007).

Screening to Brief Intervention (S2BI)

The screening to brief intervention has been designed to assess the risk level of the most frequently used substances among adolescents (Levy et al., 2014). This self-administered questionnaire takes 3 to 15 minutes to administer and mainly focuses on past year usage of tobacco, alcohol, and marijuana. If an individual indicates never for the first three questions, that person will not be continued with CRAFFT questions. The CRAFFT questionnaire is a screening tool utilized to assess the risk level of substance abuse and addiction among adolescents. Each letter of CRAFFT (Car, Relax, Alone, Forget, Family, or

Friends, Trouble) has a question that is used to assess the potential substance use issues responding Yes or No (Borus et al., 2016). This tool allows for the early identification of individuals at risk for various issues such as substance abuse, mental health problems, or risky behaviours, enabling timely interventions before problems worsen. Hence, by providing individuals with information, skills, and support, S2BI empowers them to make positive changes in their behaviour, enhancing their sense of control and self-efficacy. As a disadvantage, some individuals may be resistant to acknowledging or addressing their risky behaviour, leading to poor engagement or adherence to brief interventions, thereby limiting their effectiveness.

Adolescent Alcohol and Drug Involvement Scale (AADIS)

Moberg (2003) introduced the Adolescent Alcohol and Drug Involvement Scale as a modification of the Adolescent Alcohol Involvement Scale. According to a family history of substance abuse, poor parental supervision, lower academic achievement, and peer pressure most of the adolescents are prone to substance use. Hence, the tool internalised two parts asking about the history of substance use during the past 12 months and if a person has answered “yes” they will shift to the part 2 which has been made on CRAFFT questionnaire. Interviewer-administer version and self-administer version of questionnaires are available in this tool. In order to literature, the tool has indicated high reliability ($\alpha = 0.94$) and accuracy to differentiate the non-substance using adolescents from substance use disorders (Mason et al., 2009). According to the scoring of the tool, 0 mark indicates no alcohol or other substance usage, 1 to 36 indicates that despite the alcohol and other drug usage present, DSM criteria has not reached, and above 37 indicates alcohol and other substances present and at the same time they have fulfilled the DSM criteria regarding to substance use disorder (Moberg, 2003).

Severity of Dependence Scale (SDS)

Severity of Dependence Scale is a 5-item self-administered questionnaire that is especially designed to assess the psychological components of psychoactive drug dependence. Less than one

minute is going to complete this scale and without any specific training this can be used easily (Gossop et al, 1995). Hence, this scale can be administered among individuals who are in a high risk of Alcohol, Cannabis, Methamphetamine, Opioids, Heroin, Benzodiazepines, Cocaine and Ecstasy (National Centre for Education and Training on Addiction [NCETA], 2021). Likert scale was used to score to this scale and can be administered in both clinical and research settings (Gossop et al, 1995). Van Der Pol et al. (2013) conducted a study to investigate the validity and reliability of the severity of the dependence scale evoked good criterion validity (Cronbach's $\alpha = 0.70$) (Van Der Pol et al., 2013). Since this scale is used to measure drug dependence in both young and adult people, the paucity of the age range can be reduced (Cheng et al., 2019). This scale is highly beneficial to build up an effective treatment plan (National Centre for Education and Training on Addiction [NCETA], 2021).

Conclusion

Despite the substance, assessments are indispensable tools in assessing substance use and related behaviours about validity, and clinical utility that are essential to healthcare providers and policymakers to design the early intervention plan and improve the existing treatment outcomes. Additionally, finding substance behaviours in the early stage is also beneficial to develop systematic awareness sessions in the school setting which is the place elevating the next generation with full of knowledge and skills. Although certain subjective biases are associated with assessment tools, these are the most convenient way to emerge from various areas related to substance use.

Table 1: Substance Assessment tools with easily accessible links.

Substance assessment tool	Source of the tool
Alcohol Use Disorder Identification Test (AUDIT)	https://www.mhc.wa.gov.au/media/2607/alcohol-audit-screening-tool-mk4.pdf
Michigan Alcohol Screening Test (MAST)	https://nbminnesota.com/wp-content/uploads/2014/01/drinking-problem-test.pdf
Alcohol Dependency Scale (ADS)	https://medicine.yale.edu/intmed/vacs/instruments/alcohol_dependence_scale_4203_284_639_v1.pdf
Self-administered alcoholism screening test (SAAST)	https://www.ncbi.nlm.nih.gov/books/NBK64829/table/A46037/
Drug Abuse Screening Test (DAST)	https://www.bu.edu/bniart/files/2012/04/DAST-10_Institute.pdf
Tobacco, Alcohol, Prescription Medication, and other Substance Use (TAPS) tool	https://cde.nida.nih.gov/sites/nida_cde/files/TAPS%20Tool%20Parts%20I%20and%20II%20V2.pdf
Alcohol, Smoking and Substance Involvement Screening Test (ASSIST)	https://www.who.int/publications/i/item/978924159938-2
Substance and Choices Scale (SACS)	https://wharaurau.org.nz/sites/default/files/2022-07/2022-SACS_Clinical-Form-Questionnaire.pdf
Screening to Brief Intervention (S2BI)	https://www.mcpap.com/pdf/S2BI_postcard.pdf
Adolescent Alcohol and Drug Involvement Scale (AADIS)	https://ocfcpacourts.us/wp-content/uploads/2020/06/Adolescent_Alcohol_and_Substance_Abuse_001005.pdf
Severity of Dependence Scale (SDS)	https://www.promptdoc.com/wp-content/uploads/2019/02/Severity-of-Dependence-Scale.pdf

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Conflict of interest

The author declares no conflicts of interest.

Author contribution

In the process of main scope of the review identifying, article collecting, article filtering and review constructing and comment addressing were done by author of this study.

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