ISSN: 2754-4907

Journal of Drugs Addiction & Therapeutics

SCIENTIFIC Research and Community

Research Article

Open Access

The Use of the Severity Dependence Scale (SDS) as an Outcome in Studies of Alcohol and Other Drug Use a Systematic Review

Kyumin Jang[1]*, Erinn Gallagher[2] and Anh Dam Tran[1,2]

[1]The University of Sydney, Sydney, Australia

[2]National Drug and Alcohol Research centre, University of New South Wales, Sydney, Australia

ABSTRACT

Introduction: The Severity Dependence Scale (SDS) is a validated measure of the severity of dependence on alcohol or drugs. SDS scores can be used to guide treatment planning, monitor progress, and evaluate treatment outcomes.

Objectives: We aimed to review studies that analysed SDS as an outcome in studies of alcohol and drug use (AoD), with a particular focus on the methodology used to examine the changes in SDS.

Methods: The search was performed using the literature databases Embase, PubMed and Medline. Articles were included when the outcome was SDS in AoD. Studies that examined SDS, but not among the AoD population, studies that reported SDS as predictors, qualitative research, study protocols, conference papers, and studies in non-English language were excluded.

Results: Among 179 articles identified, 15 were included in the systematic review. Two studies conducted cannabis research, two for methamphetamine, one for cannabis and amphetamine, one for cocaine, one for ketamine, one for ecstasy and seven for general illicit drugs. Out of 15 studies, ten used the t-test for statistical analysis of the SDS, one used a generalised estimating equation, one used a Spearman non-parametric test, and one used a linear mixed model, one reported the baseline score for the SDS and did not report the SDS at follow-up, one reported a descriptive analysis of the SDS.

Conclusions: In the absence of a standardised cut-off score and a minimal important difference, more attention should be paid in analysing the discrete scale of the SDS to ensure analysis accuracy.

***Corresponding author**

Kyumin Jang, The University of Sydney, Sydney, Australia.

Received: April 08, 2024; **Accepted:** April 16, 2024; **Published:** May 06, 2024

Keywords: Drug Use, Alcohol, SDS, Severity Dependence Scale

Introduction

Patient Reported Outcome Measures (PROMs) assess health status and health-related quality of life from the patient perspective. PROMs have gained increased attention in medicine and public health. In alcohol and other drug (AoD) use, Teesson and colleagues suggest outcomes of AoD treatment cover six areas, including (1) Screening for problematic use/quantity/frequency, (2) Diagnosis (dependence/harmful use), (3) Relapse, (4) Functioning, (5) Satisfaction with services and (6) Multidimensional [1].

The Severity Dependence Scale (SDS) was developed in 1995 by Gossop at the National Addiction Centre, Maudsley Hospital, London, UK [2]. The SDS consists of five items to assess the degree of dependence of using alcohol and drugs including: (1) Did you think your use of [named drug] was out of control?; (2) Did the prospect of missing a fix (or dose) or not chasing make you anxious or worried?; (3) Did you worry about your use of [named drug]?; (4) Did you wish you could stop?; (5) How difficult would you find it to stop or go without [named drug]?. Each item is measured on a 4-point scale, scoring from 0 to 3, including (1) Never/almost never (scoring 0), (2) Sometimes (scoring 1), (3) Often (scoring 2), and (4) Always/Nearly always (scoring 3) [2]. The total SDS score can be determined by adding the points of all five items, with higher scored suggesting greater severity of dependence on using the identified substance [2]. The SDS is a methodologically reliable indicator for healthcare professionals worldwide to identify alcohol and drug dependence [3-6]. It also allows the degree of dependence for designing early and tailored interventions to minimise disorder progression [3]. The SDS could be used as a measurement of the severity of dependence in the absence of standardised research interviews [4].

The SDS has been validated for alcohol cannabis benzodiazepines opioids (codeine, heroine) khat cocaine and amphetamines [5-12]. The cut-off score for the SDS varies for different substances. For example, a cut-off of 3 has been defined for alcohol and ecstasy and 4 for amphetamines[13-14] [12]. For cannabis, the cut-off score could be 2 4 or 3 and 5 [15] [9,16,17]. For cocaine, the cut-off score could be 3 or 4 [18]. For benzodiazepines, it could be 3 or 7 [19,4]. For heroin, it could be 3 or 5 [18,20].

As a self-reported scale, the SDS has advantages – it is inexpensive, easy to interpret and quick and efficient [21,22]. In AoD, self-reports have been widely proven to be sufficiently reliable and

valid to provide descriptions of drug use, drug-related problems, and the natural history of drug use [23-28]. The SDS also has sufficient content, construct and criterion (for validity), has adequate item and test-retest (for reliability), and is a sensitive measurement (for sensitivity) [1] (Table S1). Given the high sensitivity of the SDS to diagnose AoD dependence the scale has been used for routine monitoring and screening of substance use, or as a variable to examine the correlation with other measures [3,4,6,11,15,4].

Table S1: Validation Studies for Severity of Dependence Scale

First Author	Cronbach's Alpha	Drugs	Population
Bastiani, L	74%	Cannabis	Italian adolescents aged 15–19 who reported cannabis last year use.
Cuevas, C	81.3%	Benzodiazepine	Regular benzodiazepine users in Spain.
Deluca, P	92%	Codeine	Respondents (66% women) who had used codeine containing medicines in the last 3 months and were living in the UK.
Gu, J	78%	Heroin	Chinese heroin users.
Hides, L	81%	Cannabis	Participants in Australia, who were cannabis dependent in the past 12 months.
Kassim, S	76%	Khat	UK-resident adult Yemeni male khat chewers, aged 18 years and above.
Kaye, S	86%	Cocaine	Cocaine users in Sydney, Australia.
Manzar, D	58%	Khat	Polysubstance users with khat chewing habit in Mizan, Ethiopia.
Martin, G	83%	Cannabis	Community sample of 14–18-year-old adolescent cannabis users in Australia.
Steiner, S	79.6%	Cannabis	Sample of 18-to 64-year-old cannabis users in Germany.
Ferri, P	83% (powder cocaine), 73% (crack cocaine), 78% (cannabis), 85% (alcohol)	Alcohol, cocaine (snorted), crack cocaine (smoked), cannabis and alcohol	Brazilian drug users.
Gossop, M	94%	Alcohol	People seeking treatment for drug misuse problems, who were current (last 90 days) drinkers.

The SDS is also considered as one of the routine Client Outcome Measures (COMS) to be collected [29]. It is, however, unclear how the SDS has been analysed. We aim to review literature which analysed the SDS as an outcome in studies of alcohol and drug use, with a particular focus on methodology used to examine the changes in the SDS.

Methods

Prospero Registration

This study is registered with PROSPERO under the number CRD42022169669.

Search Strategy

We reviewed studies that used the SDS as a study outcome among people with AoD dependence. The search was performed using the literature databases Embase, PubMed and Medline as those three databases were the most relevant to the research topic. Searches of each database were conducted using the search terms included in Table 1. The literature search was performed between the 10th of December 2022 and the 28th of February 2023.

Table 1: Database and Search Terms

Database	Search strategy and Mesh terms
Embase	(The Severity of Dependence Scale) OR (SDS) AND (Alcohol) OR (Drug)
PubMed	(The Severity of Dependence Scale) OR (SDS) AND (Alcohol) OR (Drug)
Medline	(The Severity of Dependence Scale) OR (SDS) AND (Alcohol) OR (Drug)

Eligibility Criteria and Screening

Articles were included when the outcome (primary or secondary) was the SDS in AoD. Studies that examined the SDS, but not among the AoD using population were excluded. Studies that reported the SDS as a predictor were excluded. Qualitative research, study protocols and conference papers were excluded. Articles were also excluded if the primary language of the article was not English.

Screening of the retrieved documents was carried out in two stages: screening of the titles and abstracts for inclusion of all relevant studies and assessment of the full texts for eligibility criteria. Two different reviewers (KJ and ADT) conducted both stages independently, and inconsistencies were resolved by a third reviewer (EG).

Screened articles were entered into an Excel spreadsheet for further full text screening and analysis. The Excel spreadsheet was used to classify each article by first author of article, year of publication, country, study design, intervention or treatment, sample size, characteristics of population, follow-up time, method, and main outcome of study, the SDS reported (mean and SD) and conclusion. In the methods and conclusion sections, only content related to drug dependence and conclusions were reported.

Results

Literature Search Results

Figure 1 depicts the PRISMA diagram of the literature search. After using the relevant MeSH terminology in three databases (Table 1), 179 articles were identified. Four articles were removed due to duplication, and 175 articles remained for the initial screening with titles and abstracts, 54 articles were determined as irrelevant to the research topic and 121 articles were eligible for the full-text assessment. After conducting full-text screening, 106 articles were removed because the articles did not meet the inclusion criteria. Of the 106 articles excluded at this stage, 100 did not consider the SDS as an outcome. Three non-English studies and three conference papers were also excluded. Finally, 15 articles were included in the systematic review.

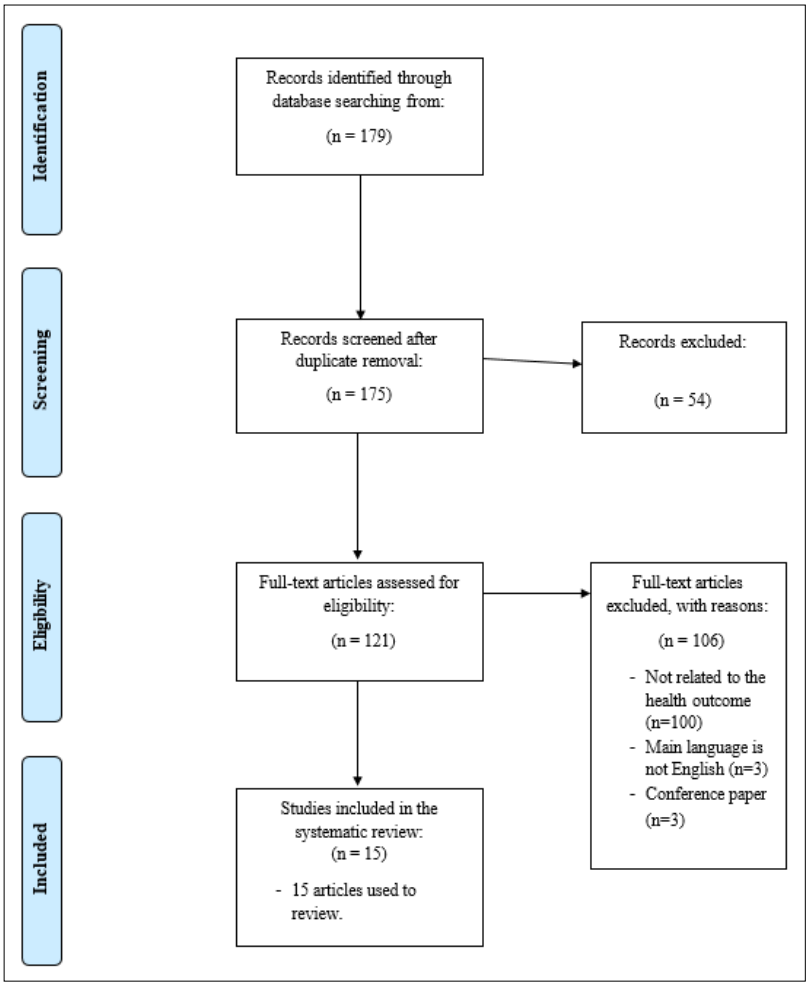

Figure 1: PRISMA Flowchart of Systematic Search of SDS

Characteristics of the Literature

Among the 15 eligible articles for the systematic review, 14 studies were published after 2004, demonstrating recent valid results [30-43]. Five articles were from Australia four articles from Europe and six articles from Asia [30-44].

Seven articles conducted randomised controlled trials two were cross-sectional studies two were cohort studies one was an observational study one was a prospective study one was a retrospective study and one was a longitudinal study [30-44]. Eleven studies were about non-pharmacotherapy interventions and four articles were about pharmacotherapy approaches for substance use disorder [30-44].

Substance of Interest

Two studies conducted cannabis research two studies for methamphetamine one study for cannabis and amphetamine one study for cocaine one study for ketamine one study for ecstasy and seven studies for general illicit drugs [30-44].

Methodology Used to Investigate SDS

Ten studies used the t-test for statistical analysis of the SDS, one study used a generalised estimating equation, one study a used Spearman non-parametric test and one study used a linear mixed model. One study only reported the baseline score for the SDS and did not report the SDS at follow-up. One study only reported a descriptive analysis of the SDS [30-44].

Association of AoD Treatment and Improved SDS

Ten studies concluded that SDS improved, and five studies concluded that SDS did not improve. Among the 10 studies that showed the improvement in SDS, nine were residential rehabilitation interventions or therapeutic approaches and one involved a pharmacotherapy. Five studies did not demonstrate improvements in SDS with regard to detoxification and pharmacotherapy [30-44].

Discussion

The SDS has been validated and recognised as an acceptable and feasible measure of the severity of substance dependence [6,11,45]. The SDS has high diagnostic utility with high specificity and sensitivity [6,11,45]. However, most studies only reported the SDS as descriptive data and/or a predictor. These may be attributed to SDS being self-reported. Using self-reported data as a study outcome remains controversial. While self-reported data in AoD have proven reliable, doubts about response bias among researchers persist [22,24,46,47]. A disadvantage of SDS is that it does not include signs of physical dependence, such as tolerance and withdrawal caused by neuroadaptation, which may limit its use as a study outcome [2].

There is a lack of standardisation in the SDS cut-off score. If the SDS is used to describe data, the cut-off score is not as important as if it is used as a study outcome. Because of the latter, an intervention could be regarded as "improved" with the chosen cut-off but could be "no improvement" if a different cut-off score was used. There have also been no cut-off scores determined for newly emergent substances, which dramatically decreases the standardisation of the SDS [34].

In the absence of a standardised cut-off score, most of the studies in our review examined SDS as a continuous variable. We found that most studies conduct the t-test without checking the normal distribution assumption of the SDS [30,32,34,41-44,48]. To assist researchers in interpreting and reporting on the SDS, the minimal important difference (MID) needs to be reported. The minimal important difference is the difference that corresponds with a change that is regarded as valuable to respondents and significant by researchers and clinicians [49]. However, we found no study reporting the MID for SDS.

Strengths and Limitations

A major strength of our study is that we conducted a rigorous systematic review. We reviewed the application of the SDS in the published literature as a study outcome. A limitation of our systematic review is that we did not conduct the reporting quality assessment. Studies included in the systematic review have different designs, including randomised control trials, cross-sectional, case-control, cohort, retrospective, prospective and longitudinal studies, which require different checklists. Secondly, we did not examine if the study interventions were associated with the improvement in the SDS, e.g., pharmacotherapy or therapeutic approach; this requires an intensive examination of the statistical analysis (bias, confounding) and study design (sample size), which was not the aim of our study. Thirdly, we excluded pharmaceutical opioids in other populations, such as those with cancer or those who were pregnant, because we wanted to focus on alcohol and illicit drugs only.

Table 2: Characteristics of Studies Used SDS as a Study Outcome

First Author and Year of Publication	Country	Study design	Intervention/ Treatment	Follow up time	Sample size	Population	Main outcome/Method	Mean SDS at baseline	Mean difference after intervention/ exposure group	Conclusion
Ahlers et al 2022.	38.1% Switzerland 36.5% Austria 24.7% Germany	Randomised controlled trial subgroup analysis	CANreduce 2.0 Self-guided web-based intervention (6 weeks duration) consists of modules grounded in motivational interviewing and cognitive behaviour therapy	3 months follow up	367	Cannabis use in adults who screen positive for attention deficit/ hyperactivity disorder	Main outcomes: Number of days cannabis was used in the preceding 30 days, the cannabis use disorder identification test score (CUDIT) and the SDS at baseline and the 3-months follow-up. Method: SDS with a score >4 indicating cannabis dependence. Main outcomes of interest were compared between baseline and 3-months follow-up using paired t tests.	With attention deficit/ hyperactivity disorder: 9.1 (3.0) Without attention deficit/ hyperactivity disorder: 7.1 (3.1)	With attention deficit/ hyperactivity disorder: 5.55 (2.86) Without attention deficit/ hyperactivity disorder: 4.63 (3.02)	Both adults with and without positive attention-deficit/ hyperactivity disorder screening reported significantly reduced in SDS with CANreduce 2.0.
Alammehrjerdi et al 2019.	Iran	Randomised controlled trial	Brief cognitive behavioural therapy	4 and 12 weeks follow up	120	Regular methamphetamine uses among methadone-maintained women	Main outcomes: frequency of methamphetamine use, severity of methamphetamine dependence, number of days of methamphetamine use, motivation to change, psychological well-being, social functioning. Method: Independence sample t-test was used to examine the association between the SDS and the BCBT	Treatment group: 9.9 (2.2) Control group: 9.9 (2.52)	4 weeks: Treatment group: 3.8 (2.09) Control group: 9.8 (2.59) 12 weeks: Treatment group: 3.7 (2.15) Control group: 9.9 (2.65)	BCBT was efficacious in reducing in SDS among the regular methamphetamine used women with methadone treatment.
Alharbi et al 2022.	Saudi Arabia	Cross-sectional study	Detoxification	21 days of treatments	90	Group I: control group Group II: amphetamine users Group III: amphetamine plus cannabis users	Group I: control group Group II: amphetamine users Group III: amphetamine plus cannabis users	Amphetamine user group: 10.86 (2.47) Amphetamine and cannabis use group: 10.06 (2.30)	Not reported	Not clear if the SDS was improved after detoxification.
Amini-Lari et al. 2017	Iran	Randomised controlled trial	Cognitive-Behavioural Therapy	3 months follow up	118	Opiate users in methadone treatment	Main outcomes: Opiate treatment index, contemplation ladder, SDS, Method: Association between the SDS and CBT was examined by independent samples t-test	Treatment group: 9.55 (9.13 - 9.98) Control group: 9.56 (9.65 - 9.46)	Treatment group: Intervention: 5.56 (4.77 - 6.48) Follow-up: 5.27 (4.32 -6.23) Control group: Intervention: 9.81 (9.28 - 10.35) Follow-up: 10.55 (9.30 -11.08)	SDS was improved among the opiate users in methadone treatment with CBT.

Cruickshank et al 2008.	Australia	Randomised controlled trial	Placebo versus Mirtazapine	Measures recorded on days 0, 3, 7, 14	31	Methamphetamine users	Main outcomes: the Athens Insomnia Scale, the Brief Symptom Inventory, the Depression – Anxiety – Stress Scale (DASS), SDS. Method: Mean values were compared between treatment groups using Student's t-test for independent samples t-test Not significant, the exact p-value is not reported. Effects of time on combined means were examined using repeated-measures analysis of variance (ANOVA) across days 0, 3, 7 and 14.	Day 0: Mirtazapine: 11.3 (0.9) Placebo: 11.2 (0.6) Total: 11.2 (0.5)	Day 3: Mirtazapine: 8.2 (1.2) Placebo: 10.2 (0.9) Total: 9.3 (0.8) Day 14: Mirtazapine: 8.3 (1.6) Placebo: 8.0 (1.2) Total: 8.1 (1.0)	There is no difference in SDS scores between Mirtazapine and placebo groups day 0, 3, 7, 14. There is no difference in SDS scores by time for the whole sample.
Garvey et al 2021.	United Kingdom	Cohort study	Breaking Free Online computer-assisted therapy (BFO) and Pilars of Recovery intensive group therapy (PoR)	Follow-up time varied due to various factors such as attrition, moving prisons, or being released from prison	466	Individuals who used illicit substances within the criminal justice system	Main Outcomes: WHO Quality of Life assessment, SDS and Rapid recovery progression measure Method: T-tests were used to examine the effects of the interventions and SDS.	BFO pre: 9.42 (3.98) PoR pre: 9.80 (4.40)	BFO post: 5.96 (4.42) PoR post: 7.31 (4.93)	SDS scores decreased significantly among the substance involved clients within the criminal justice system with the interventions.
Jonas et al 2018.	Germany	Randomised Factorial Trial	Factor 1: real-time -counselling via text-chat: Yes vs No Factor 2: intervention duration: 50 days vs 28 days	3, 6 and 12 months follow up	135	Cannabis users	Main outcomes: cannabis-use days during the past 30 days using a Timeline Followback procedure. cannabis quantity, cannabis-use events, cannabis dependency (SDS), treatment satisfaction (Client Satisfaction Questionnaire), and working alliance (Working Alliance Inventory-short revised). Method: Generalised estimating equations were used to examine the effects of the experimental factors on all cannabis-related study outcomes.	Factor 1: Chat-based communication No: 9.9 (2.8) Yes: 10.0 (2.7) Factor 2: Treatment length 28 days: 10.1 (2.5) 50 days: 9.8 (2.9)	3 months Factor 1: Chat-based communication No: 7.2 (3.5) Yes: 6.8 (3.6) Factor 2: Treatment Length 28 days: 7.0 (3.5) 50 days: 6.9 (3.6) 6 months Factor 1: Chat-based communication No: 5.4 (3.4) Yes: 5.1 (3.8) Factor 2: Treatment Length 28 days: 5.4 (3.6) 50 days: 5.1 (3.7) 12 months Factor 1: Chat-based communication No: 5.5 (3.6) Yes: 5.4 (3.8) Factor 2: Treatment Length 28 days: 5.7 (3.6) 50 days: 5.2 (3.8)	Both treatments decrease the SDS score after 3-, 6- and 12-months follow-up. As chat-based counselling shows higher user ratings, it should be provided for those users who prefer to be supported that way.

Kapoor et al 2019.	India	Observational study	Buprenorphine treatment	1, 3 and 6 months follow up	202	Patients with opioid dependence	Opiate Treatment Index (Drug use and crime index), and SDS, WHO Quality of Life scale Method: Spearman non-parametric test	Baseline Heroin abuser: 11.75 (1.36) Opium/doda abuse: 4.52 (1.86) Capsule Proxyvon abuser: 4.0 (0.71)	1st month Heroin abuser: 0.71 (0.45) Opium/doda abuse: 0.46 (0.16) Capsule Proxyvon abuser: 0.21 (0.13) 3rd month Heroin abuser: 0.52 (0.33) Opium/doda abuse: 0.32 (0.29) Capsule Proxyvon abuser: 0.19 (0.14) 6th month Heroin abuser: 0.41 (0.23) Opium/doda abuse: 0.21 (0.19) Capsule Proxyvon abuser: 0.14 (0.12)	There is a significant improvement in heroin abuser 1 month onward. Scores have also decreased in opium and capsule Proxyvon abuser, but results are not significant.
Kelly et al 2021.	Australia	Non-randomised, prospective, single-arm trial	Mobile health app for routine outcome monitoring and feedback in SMART recovery mutual support groups	8 weeks follow up	72	Individuals with drug additive behaviour	Main outcome: SDS, Drug and alcohol use, Kessler 10+, WHO quality of life 8, BTOM-C items on arrests, BTOM-C items on risky drug using practices, Substance use recovery evaluator, Client service receipt inventory, Method: Paired sample two-tailed t-test were used to compare participant reported outcomes on the SDS	Not reported	Not reported	There was a significant reduction in SDS between baseline and 8-week follow-up for the SDS (mean difference 1.93, SD 3.02; 95% CI 1.12 to 2.73)
Marceau et al 2021.	Australia	Cohort study	Dialectical bevhaviour therapy	6 weeks, 12 weeks, 6 months, and 12 months follow up	202	Young individuals in residential substance use disorder treatment receiving group dialectical behaviour therapy.	Main outcomes: Global psychiatric symptoms, SDS, Brief Situational Confidence Questionnaire, World Health Organisation Quality of Life-8, Group session rating scale, Treatment integrity checklist Method: Linear mixed model was used to examine the effect of the intervention.	Baseline: 9.5 (3.0)	6 weeks: 7.7 (3.3) 12 weeks: 8.6 (4.0) 6 months: 5.0 (3.5) 12 months: 5.7 (5.0)	SDS scores improved over time for young people in residential substance use disorder treatment receiving dialectical behaviour therapy
Martin et al 2010.	Australia	Randomised controlled trial	Single motivational and cognitive behavioural intervention	3 months follow up	50	Individuals used ecstasy at least once in the past month	Main outcome: percentage abstinent for 90 days, days of ecstasy use in the 90 days, mean pills used, dependence symptoms, SDS score. Method: T-test was used to examine the association between SDS and intervention for the groups at follow-up.	Baseline: Regular ecstasy users: 2.3 (2.6) Delayed treatment control group: 2.6 (2.2)	3 months: Regular ecstasy users: 3.0 (2.6) Delayed treatment control group: 1.6 (1.8)	SDS did not improve with single motivational and cognitive behavioural intervention.

Shearer et al 2003.	Australia	Randomised controlled trial	Dexamphetamine vs placebo for cocaine dependence	14 weeks follow up	30	Cocaine-dependent injecting drug user	Main outcomes: cocaine use, cocaine craving, SDS, crime. Method: Association between SDS and treatment was examined by independent samples t-test for equality of means (two-tailed) between groups at follow-up.	Dexamphetamine group mean SDS: 9.7 Placebo group mean SDS: 10.7	Dexamphetamine group: mean SDS: 7.6 Placebo group mean SDS: 9.0	While the improvements were not significant between groups, within-group analysis revealed that the treatment reduced severity of cocaine dependence (P<0.01) with no within-group improvements found in the placebo group.
Szerman et al 2020.	Spain	Retrospective study	Once-Monthly Long-Acting Injectable Aripiprazole	3 and 6 months follow up	40	Patients with schizophrenia with a coexisting substance use disorder	Main outcomes: Clinical Global Impression (CGI) severity scale for schizophrenia, World Health Organisation Disability Assessment Scale (WHODAS-2.0), and the SDS. Method: Changes after treatment initiation in the outcome measures were analysed using a paired Student's t test.	Tobacco: 12 Alcohol: 10.6 Caffeine: 10.1 Cannabis: 10.5 Heroin: 11.3 Sedatives: 11.4 Cocaine: 11.2	Tobacco: 11.2 Alcohol: 8.9 Caffeine: 8.9 Cannabis: 9.6 Heroin: 9.6 Sedatives: 9.8 Cocaine: 8.4	No significant reduction in the severity of the dependence scale was observed in patients with substance use disorders.
Tang et al 2019.	Longitudinal study	Longitudinal study	residential drug rehabilitation services	12 weeks follow up	292	Ketamine users	Main outcomes: Cognitive assessment: Beck Depression Inventory (BDI), Anxiety Subscale of the Hospital Anxiety Depression Scale (HADSA).	8.5 (2.9)	Not reported	Chronic ketamine users improved verbal and visual memory and executive functions after 12 weeks of abstinence at baseline SDS 8.5.
Yasin et al 2020.	Jordan	Cross-sectional Study	Two public addiction rehabilitation centres in Jordan	5 months follow up	93	Patients at two public addiction rehabilitation centres in Amman	Main outcomes: quality of life, quality of sleep, SDS. Method: Descriptive analysis only.	Mean SDS score of 11.43 (SD ± 3.48). Around 90% of the respondents scored >6 and 60% scored >10 suggesting a high level of dependence, 23% scored 15 (maximum) suggesting a severe dependence.	NA	Pattern of substance use changed significantly in Jordan with synthetic cannabinoids. being of the top substances used and heroin use dropping.

Conclusion

In the absence of a standardized cut-off score and a minimal important difference (MID), more attention should be paid in analysing the discrete scale of the SDS to ensure analysis accuracy.

Author Contribution

KJ: searched literature, wrote the manuscript; EG: searched literature, wrote part of the manuscript; ADT: designed the aims, method, searched literature, wrote the manuscript, supervised the team.

Acknowledgement

We thank Dr Jaleh Gohlami, Dr Mark Chambers for their help editing the manuscript.

References

1. Teesson MN, Clement J, Copeland, Andrew Conroy, Amanda Reid (2000) The measurement of outcome in alcohol and other drug treatment: a review of available instruments. National Drug & Alcohol Research Centre Medicine https://ndarc.med.unsw.edu.au/resource/measurement-outcome-alcohol-and-other-drug-treatment-review-available-instruments.
2. Gossop M, Darke S, Griffiths P, Hando J, Powis B, et al. (1995) The Severity of Dependence Scale (SDS) psychometric properties of the SDS in English and Australian samples of heroin cocaine and amphetamine users. Addiction Abingdon England 90: 607-614.
3. Bastiani, L, Siciliano V, Curzio O, Luppi C, Gori M, et al. (2013) Optimal scaling of the CAST and of SDS Scale in a national sample of adolescents. Addictive behaviors 38: 2060-2067.
4. Cuevas CDL, Sanz EJ, Fuente JADL, Padilla J, Berenguer JC (2000) The Severity of Dependence Scale (SDS) as screening test for benzodiazepine dependence SDS validation study. Addiction Abingdon England 95: 245-250.
5. Gu J, Lau JTF, Chen H, Zhiming Liu, Zhangquan Lei, et al. (2007) Validation of the Chinese version of the Opiate Addiction Severity Inventory (OASI) and the Severity of Dependence Scale (SDS) in non-institutionalized heroin users in China. Addictive behaviors 33: 725-741.
6. Deluca P, Foley M, Dunne J, Andreas Kimergård (2021) The Severity of Dependence Scale (SDS) for Codeine Preliminary Investigation of the Psychometric Properties of the SDS in an Online Sample of Codeine Users From the UK. Frontiers in Psychiatry 12: 1-7.
7. Gossop MJ, Marsden, Stewart D (2002) Dual dependence assessment of dependence upon alcohol and illicit drugs and the relationship of alcohol dependence among drug misusers to patterns of drinking illicit drug use and health problems. Addiction 97: 169-178.
8. Ferri P, Marcelo de Araujo JM, Ronaldo Laranjeira R, Michael Gossop, Cleusa (2000) Validity and reliability of the Severity of Dependence Scale (SDS) in a Brazilian sample of drug users. Drug and alcohol review 19: 451-455.
9. Martin G, Copeland J, Gates P. Stuart Gilmour (2006) The Severity of Dependence Scale (SDS) in an adolescent population of cannabis users Reliability validity and diagnostic cut off. Drug and alcohol dependence 83: 90-93.
10. Manzar MD, Alamri M, Mohammed S, Mohammed Ali Yunus Khan, Vijay Kumar Chattu, et al. (2018) Psychometric properties of the severity of the dependence scale for Khat (SDS-Khat) in polysubstance users. BMC Psychiatry 18: 1-6.
11. Kaye S, Darke S, (2002) Determining a diagnostic cut off on the Severity of Dependence Scale (SDS) for cocaine dependence. Addiction Abingdon England 97: 727-731.
12. Topp L, Mattick RP (1997) Choosing a cut off on the Severity of Dependence Scale (SDS) for amphetamine users. Addiction Abingdon England 92: 839-845.
13. Lawrinson P, Copeland J, Gerber S, Stuart Gilmour (2007) Determining a cut off on the Severity of Dependence Scale (SDS) for alcohol dependence. Addictive behaviors 32: 1474-1479.
14. Bruno R, Gomez R, Matthews A (2011) Choosing a cut off on the Severity of Dependence Scale for Ecstasy use. The Open Addiction Journal.
15. Hides L, Dawe S, Young RM, Kavanagh DJ (2007) The reliability and validity of the Severity of Dependence Scale for detecting cannabis dependence in psychosis. Addiction Abingdon England 102: 35-40.
16. Steiner S, Baumeister SE, Kraus L (2008) Severity of Dependence Scale Establishing a cut off point for cannabis dependence in the German adult population. Sucht 54: 57-63.
17. Swift W, Copeland J, Hall W (1998) Choosing a diagnostic cut off for cannabis dependence. Addiction, 93: 1681-1692.
18. González Sáiz F, Domingo Salvany A, Barrio G, Albert Sánchez-Niubó, Teresa Brugal M, et al. (2009) Severity of dependence scale as a diagnostic tool for heroin and cocaine dependence. European addiction research 15: 87-93.
19. Ross JE, Darke S (1997) Benzodiazepine dependence and psychopathology among heroin users in Sydney. National Drug and Alcohol Research Centre Sydney https://ndarc.med.unsw.edu.au/sites/default/files/ndarc/resources/TR.050.PDF .
20. Iraurgi Castillo I, González Saiz F, Lozano Rojas O, M A Landabaso Vázquez, J M Jiménez Lerma (2010) Estimation of cutoff for the Severity of Dependence Scale (SDS) for opiate dependence by ROC analysis. Actas Esp Psiquiatr 38: 270-277.
21. Kline P (2013) Personality The psychometric view. Routledge https://www.routledge.com/Personality-The-Psychometric-View/Kline/p/book/9780203168431.
22. Paulhus DL, Vazire S (2007) The self report method. Handbook of research methods in personality psychology 1: 224-239.
23. Darke S (1998) Self report among injecting drug users A review. Drug and Alcohol Dependence 51: 253-263.
24. Carter G, Spittal MJ, Glowacki L, Dimitri Gerostamoulos, Paul Dietze, et al. (2023) Diagnostic accuracy for self-reported methamphetamine use versus oral fluid test as the reference standard in a methamphetamine-dependent intervention trial population. Addiction 118: 470-479.
25. Harrell AV (1985) Validation of self-report the research record in Self-Report Methods of Estimating Drug Use: Meeting Current Challenges to Validity. National Institute on Drug Abuse Research Monograph 1985 https://www.govinfo.gov/content/pkg/GOVPUB-HE20-PURL-gpo118243/pdf/GOVPUB-HE20-PURL-gpo118243.pdf.
26. Rouse BA, Kozel NJ, Richards LG (1985) Self-Report methods of estimating drug use Meeting current challenges. Chicago IL National Institute on Drug Abuse https://www.govinfo.gov/content/pkg/GOVPUB-HE20-PURL-gpo118243/pdf/GOVPUB-HE20-PURL-gpo118243.pdf.
27. Mieczkowski T, Barzelay D, Gropper B, Wish E (1991) Concordance of three measures of cocaine use in an arrestee population hair urine and self-report. Journal of psychoactive drugs 23: 241-249.
28. Magura S, Freeman RC, Siddiqi Q (1991) The validity of hair analysis for detecting cocaine and heroin use among addicts. International Journal of the Addictions27: 51-69.
29. Deady M (2009) A review of screening, assessment and outcome measures for drug and alcohol settings. Drug and Alcohol and Mental Health Information Management Project Sydney NSW Department of Health https://nada.org.au/resources/a-review-of-screening-assessment-and-outcome-measures-for-drug-and-alcohol-settings/.
30. Ahlers J, Baumgartner C, Augsburger M, Andreas Wenger, Doris Malischnig, et al. (2022) Cannabis Use in Adults Who Screen Positive for Attention Deficit/Hyperactivity Disorder CAN reduce 2.0 Randomized Controlled Trial Subgroup Analysis. Journal of medical Internet research 24: e30138.
31. Alammehrjerdi Z, Briggs NE, Biglarian A, Azarakhsh Mokri, Kate Dolan, et al. (2019) A Randomized Controlled Trial of Brief Cognitive Behavioral Therapy for Regular Methamphetamine Use in Methadone Treatment. Journal of

psychoactive drugs 51: 280-289.

32. Alharbi RS, Alhowail AH, Alharbi AG, Ashraf Mahmoud Emara (2022) Evaluation of the health status outcome among inpatients treated for Amphetamine Addiction. Saudi journal of biological sciences 29: 1465-1476.
33. Amini Lari M, Alammehrjerdi Z, Ameli F, Hassan Joulaei, Reza Daneshmand, et al. (2017) Cognitive Behavioral Therapy for Opiate Users in Methadone Treatment A Multicenter Randomized Controlled Trial. Iran J Psychiatry Behav Sci 11: e9302.
34. Cruickshank CC, Montebello ME, Dyer KR, Allan Quigley, Jozef Blaszczyk, et al. (2008) A placebo-controlled trial of mirtazapine for the management of methamphetamine withdrawal. Drug and alcohol review27: 326-333.
35. Garvey M, Elison-Davies S, Weekes J (2021) Examining the Effectiveness of Two Substance Use Interventions Within the Criminal Justice System. The Canadian journal of addiction 12: 59-66.
36. Jonas B, Marc-Dennan T, Tossmann P, Evelin Strüber (2018) Effects of Treatment Length and Chat-Based Counseling in a Web-Based Intervention for Cannabis Users Randomized Factorial Trial. Journal of medical Internet research 20: e166.
37. Kapoor A, Kohli K, Sarma P, Nimmi A Jose (2019) Improvement in quality of life with buprenorphine in opioid dependence. National journal of physiology pharmacy and pharmacology 9: 1-694.
38. Kelly PJ, Beck AK, Deane FP, Briony Larance, Amanda Baker L, et al. (2021) Feasibility of a mobile health app for routine outcome monitoring and feedback in SMART recovery mutual support groups Stage 1 mixed methods pilot study. Journal of medical Internet research 23: e25217-e25217.
39. Marceau EM, Holmes G, Cutts J, Lauren Mullaney, Denise Meuldijk, et al. (2021) Now and then a ten year comparison of young people in residential substance use disorder treatment receiving group dialectical behaviour therapy. BMC psychiatry 21: p1-362.
40. Martin G, Copeland J (2010) Brief intervention for regular ecstasy (MDMA) users Pilot randomized trial of a Checkup model. Journal of substance use 15: 131-142.
41. Szerman N, Basurte-Villamor I, Vega P, Jose Martinez-Raga, Carlos Parro-Torres, et al. (2020) Once Monthly Long Acting Injectable Aripiprazole for the Treatment of Patients with Schizophrenia and Cooccurring Substance Use Disorders A Multicentre Observational Study. Drugs -- real world outcomes 7: 75-83.
42. Tang WK, Lau CG, Ungvari GS, Shih-Ku Lin, Hsien-Yuan Lane, et al. (2019) Recovery of cognitive functioning following abstinence from ketamine. Addictive behaviors 99: 106081-106081.
43. Yasin H, Bulatova N, Wazaify M (2020) Patterns of Substance Use among Patients in Addiction Rehabilitation in Jordan. Substance use & misuse 55: 1035-1044.
44. Shearer J, Wodak A, van Beek I, Richard Mattick P, John Lewis, et al. (2003) Pilot randomized double blind placebo-controlled study of dexamphetamine for cocaine dependence. Addiction Abingdon England 98: 1137-1141.
45. Kassim S, Islam S, Croucher R (2010) Validity and reliability of a Severity of Dependence Scale for khat SDS khat. Journal of ethnopharmacology 132: 570-577.
46. McDonald JD, (2008) Measuring personality constructs the advantages and disadvantages of self-reports, informant reports and behavioural assessments. Enquire 1: 1-19.
47. Lilienfeld SO, Fowler KA, Sellbom, Martin, McCrary, Kristen L (2006) The Self-Report Assessment of Psychopathy Problems Pitfalls and Promises https://psycnet.apa.org/record/2018-14405-010.
48. McGregor C, Machin A, White J (2003) In-patient benzodiazepine withdrawal comparison of fixed and symptom triggered taper methods. Drug and alcohol review22: 175-180.
49. Jaeschke R, Singer J, Guyatt GH (1989) Measurement of health status Ascertaining the minimal clinically important difference. Controlled Clinical Trials 10: 407-415.