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The evaluation of validity and reliability of substance abuse subtle screening inventory (SASSI-3)

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Abstract

The aim of this study is to survey of validity and reliability of substance abuse subtle screening inventory (SASSI - 3). 680 students from universities of Tehran and 102 addicted patients of clients of substance abuse treatment centers in Tehran were included. Chronbach's alpha for SASSI-3 obtained 0.74. This relatively high level of Chronbach's alpha showed relatively high level of reliability. Correlation results, between SASSI–3 scales and also SASSI–3 show convergence of SASSI-3 at measurement of single phenomenon. The positive correlation of SASSI-3 and AAS show opportune convergent validity. the difference of t-test scores of students and addicted patients on SASSI-3 and the difference of main effect of group variable on SASSI-3 scales between students and addicted patients according to (MANOVA) show opportune discriminant validity and A_z (discriminant index) of 0.97 for SASSI - 3 show opportune diagnostic validity.

1. Introduction

SASSI-3 was published 1988. It is a brief, objective screening tool for human service practitioners who work in a variety of settings. The SASSI -3 was designed to identify individuals who have a high probability of having a diagnosable substance –use disorder, so that they may be further evaluated regarding specific diagnostic criteria and specifiers (e.g., status in regard to physiological dependence and remission). A related goal in developing the SASSI-3 was to create an instrument that would be able to identify people with substance –use disorders regardless of whether they are able or willing to acknowledge relevant symptoms. There is ongoing research regarding the extent to which individuals are accurate in their self- reports of substance misuse (e.g., Otto & Hall, 1988; Otto, Lang, Megargee & Rosenblatt, 1988; Sinnett, Benton & Whitfill, 1991; Sobell&Sobell, 1990). Given the possibility that some substance misusers may not be able or willing to acknowledge all relevant behaviors it is of value to have

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an addictions assessment tool that does not relay exclusively on clients to be fully forthright in reporting symptoms. Alcohol dependency inventory (CAGE), Mac Andrew Alcoholism Scale-R (MAC-R), Michigan Alcohol Screening Test (MAST) and SASSI-3 are the most relevant inventories that uses in universities but SASSI-3 is the newest one (Clements, 2002, Lazowski et al.1998, Miller et al. 2003). Although prior research on old version of SASSI-3, in student samples has gained primary supports (Cooper, Robinson, 1987, Myerholtz & Rosenberg 1998) but little research on SASSI-3 has been done until now. (Clements, 2002, Laux et al, 2005). Clements (2002) has evaluated, psychometric characteristic of SASSI-3 on a population of 254 students. Internal consistency coefficient (Chronbach's alpha) for SASSI-3 and it's subscales was calculated between 0/03 (RAP scale) to 0/92 (FVOD scale). Higher coefficient has belonged to scales with formal validity (FVOD &FVA) and SYM scale. Laux et al. (2005) have assessed, SASSI-3, MAST, CAGE, MAC-R, on a population of 230 students, and it's results show that psychometric characteristics of SASSI-3 are equal or better than others. Teslak (2000), have assessed, MAST, DAST (Drug Abuse Screening Test), SASSI-3, CAGE on a population of 70 psychotic outpatients, he found that diagnostic accuracy of SASSI-3 isn't significantly higher than others. Pearson (2000), has evaluated the ability of SASSI-3 to diagnose of substance abuse in chronic psychotic patients and he has stated SASSI-3 isn't adequate for using only as a screening tool. Arenth et al (2001), has evaluated the function of SASSI-3 on population of mental injured people and didn't confirm SASSI-3 for diagnose of them, but it presented as a valid and reliable tool for diagnose of substance dependency in normal population. Of course, it worth's mentioning that, even with such few researches, high psychometric criteria of SASSI-3 on students, can be approved. Frequent and increasing use of SASSI-3 on students and inadequate experimental information about psychometric characteristic of it is expressive to urgent need for purposive researches in this area. So with attention to increasing problems that addiction makes in society, this research will be productive to addiction evaluation and control.

We considered two questions: 1-Does SASSI-3 have opportune reliability for evaluating substance abuse in students of university? 2-Does SASSI-3 have opportune validity for evaluating substance abuse in students of university?

2. Method

2.1.Participants

statistic population of this research are 680 students from universities of tehran, and 102 addicted clients of substabnce abuse treatment centers in tehran, were included in this study. Student's sampling was multi-staged. First, we randomly selected a number of Tehran's universities; Beheshti, Tehran, Allameh, IAU science &research campus (olum tahghighat) universities. In them, we've chosen, psychology, Humanitarian, Technical, Medicine, Social science, Art, Management, Economics & Foreign language faculties. Students of these faculties were sampled randomly from available classes. Addicted samples selected from available clients in substance abuse treatment centers in Tehran.

2.2.Measures

2.2.1. Substance Abuse Subtle Screening Inventory (SASSI-3)
SASSI-3 has developed at 1997 for distinguishing people who will have high probability to being substance abusing and specially substance dependent that are 18 years and over. (Clements, 2002, Lazaw ski et al.1998, Miller, 2005). SASSI-3 has 93 items and 10 scales, 8 scales are true /false and 2 scales are likert with four grades.

2.2.2. Addiction Admission Scale (AAS)
AAS scale developed in 1992 for evaluating participant's tendency to presenting report from problems that are resulted from substance abuse. (Clements & Heintz, 2002) Test-retest, internal consistency, content validity and criterion (predictive, concurrent) validity was evaluated. The AAS scale has opportune psychometrics properties. (Weed, N., Butcher, S., Mckenna, T. & Ben-povath, Y. 1992).

2.3. Procedure

This research is a survey research, one kind of descriptive (non-experimental) research. In this research in order to evaluate the data we use descriptive and inferential statistic methods. Descriptive statistic consists of mean, standard deviation (SD) and frequency. In order to examine research question, we use inferential statistic indexes such as independent group's t-test, multivariate analysis of variance (MANOVA), receiver operating characteristics analysis (ROC), sensitivity analysis (SA), correlation and chronbach's alpha. We have utilized, SPSS & MEDCALC in order to increasing the accuracy of the data processing and it's analysis.

3. Results

3. 1. Descriptive statistic results

Table 3. The results of descriptive statistic for SASSI-3 and also AAS in student sample (Left) and addicted sample (Right).

Scales	Mean	SD	Scales	Mean	SD	Scales	Mean	SD	Scales	Mean	SD
SASSI	22/79	0/37	OAT	4/86	0/08	SASSI	43/66	1/44	OAT	5/86	0/22
COR	4/41	0/09	SYM	1/75	0/08	COR	6/03	0/26	SYM	4/95	0/20
FAM	8/57	0/08	FVOD	1/14	0/18	FAM	7/50	0/21	FVOD	13/63	0/80
RAP	0/67	0/04	FVA	0/93	0/14	RAP	1/04	0/11	FVA	2/83	0/60
SAM	6/08	0/07	AAS	2/43	0/08	SAM	7/73	0/16	AAS	4/90	0/23
DEF	4/80	0/07	SAT	2/44	0/05	DEF	4/27	0/18	SAT	3/20	0/15

3.2. The results of reliability

Table 4.The results of chronbach's alpha for SASSI-3 and it's scales and also AAS for students' sample (Left) and addicted sample (Right)

Scale	N (Total, women, men)	α (Total, female, male)	Questions	Scales	N (Total, women, men)	α (Total, female, male)	Questions
SYM	600,233,365	0/78,0/80,0/77	11	SYM	93	0/52	11
OAT	614,230,382	0/46,0/53,0/42	12	OAT	90	0/48	12
SAT	616,232,382	0/19,0/27,0/14	8	SAT	96	0/23	8
DEF	627,232,393	0/40,0/43,0/38	11	DEF	92	0/37	11
SAM	616,230,384	0/21,0/33,0/10	14	SAM	91	0/12	14
RAP	650,242,406	0/55,0/57,0/54	6	RAP	96	0/33	6
FVA	602,227,375	0/95,0/96,0/94	12	FVA	102	0/93	12
FVOD	603,226,376	0/96,0/98,0/94	14	FVOD	102	0/82	14
FAM	610,235,373	0/39,0/38,0/40	14	FAM	92	0/29	14
COR	597,231,364	0/61,0/60,0/61	15	COR	92	0/58	15
SASSI	323,124,199	0/74,0/62,0/77	93	SASSI	102	0/81	93
AAS	560,220,339	0/67,0/62,0/68	13	AAS	102	0/55	13

3.3. The results of validity
3.3.1. Convergent validity

Table 5. Correlation between results of SASSI-3 scales and also SASSI-3 and AAS scale in student sample.

	FAM	COR	SASSI	FVA	FVOD	AAS	SYM	OAT	SAT	DEF	SAM	RAP
FAM	1											
COR	-0/399[**]	1										
SASSI	-0/338[**]	0/457[**]	1									
FVA	-0/201[**]	0/205[**]	0/833[**]	1								
FVOD	-0/202[**]	0/250[**]	0/854[**]	0/874[**]	1							
AAS	-0/389[**]	0/487[**]	0/599[**]	0/484[**]	0/496[**]	1						
SYM	-0/480[**]	0/608[**]	0/594[**]	0/330[**]	0/322[**]	0/547[**]	1					
OAT	-0/433[**]	0/689[**]	0/406[**]	0/128[**]	0/166[**]	0/391[**]	0/353[**]	1				
SAT	-0/386[**]	0/393[**]	0/487[**]	0/245[**]	0/257[**]	0/318[**]	0/400[**]	0/266[**]	1			
DEF	0/361[**]	-0/373[**]	0/028	-0/023	-0/060	-0/165[**]	-0/141[**]	0/400[**] -	-0/019	1		
SAM	-0/233[**]	0/549[**]	0/358[**]	0/084[*]	0/096[*]	0/265[**]	0/425[**]	0/490[**]	0/168[**]	-0/042	1	
RAP	-0/283[**]	0/336[**]	0/358[**]	0/216[**]	0/189[**]	0/300[**]	0/490[**]	0/139[**]	0/305[**]	0/134[**]	0/187[**]	1

Table 6. Correlation between results of SASSI-3 scales and also SASSI-3 and AAS scale in addicted sample.

	FAM	COR	SASSI	FVA	FVOD	AAS	SYM	OAT	SAT	DEF	SAM	RAP
FAM	1											
COR	-0/289**	1										
SASSI	-0/372**	0/484**	1									
FVA	-0/235*	0/292**	0/728**	1								
FVOD	-0/253*	0/319**	0/808**	0/366**	1							
AAS	-0/291**	0/487**	0/697**	0/549**	0/530**	1						
SYM	-0/301**	0/602**	0/566**	0/323**	0/342**	0/566**	1					
OAT	-0/384**	0/670**	0/548**	0/226*	0/376**	0/440**	0/292**	1				
SAT	-0/327**	0/282**	0/456**	0/219*	0/241*	0/250*	0/306**	0/268**	1			
DEF	0/452**	-0/476**	-0/246*	-0/187	-0/363**	-0/387**	-0/356**	-0/295**	-0/058	1		
SAM	-0/167	0/650**	0/419**	0/178	0/240*	-0/292**	0/456**	0/555**	0/181	-0/183	1	
RAP	-0/009	-0/087	-0/072	-0/003	-0/162	0/095	0/062	-0/124	-0/126	0/093	-0/203*	1

** $P < 0/01$ * $P < 0/05$

3.3.2. Discriminant validity

Table 7. T-test of addicted students for SASSI-3 and AAS scale.

Scales	d.f	t	Significance Level	Mean difference	Standard Error of Difference Estimation
SASSI	776	-19/02	0/001	-20/86	1/10
AAS	756	-10/78	0/001	-1/62	0/23

Table 8. T-Hotling test for evaluating linear combination of differences of SASSI-3 in addicted and student's sample.

Statistic Group	T - Hotling	F	DoF	Significance Level
Group	1 / 33	93 /96	10 – 704	0 / 001

Table 9: The effects between subjects on the base of group on the scales of SASSI-3.

variable	Dependent variable	Type III sum of square	DoF	F	Significance Level
	SYM	887/27	1	207/09	0/001
	OAT	82/30	1	17/82	0/001
	SAT	51/86	1	29/21	0/001
	DEF	25/13	1	7/04	0/001
Group	SAM	230/07	1	73/64	0/001
	RAP	8/93	1	7/78	0/001
	FVA	339/00	1	22/72	0/001
	FVOD	13711/63	1	552/39	0/001
	FAM	95/65	1	20/68	0/001
	COR	225/66	1	36/12	0/001

Table 10. The results of ROC and sensitivity analysis for SASSI-3 and it's scales in student and addicted sample.

ROC analysis

scale	A_z	Standard Error	Confidence interval
SYM	0/95	0/02	0/97 تا 0/92
OAT	0/73	0/03	0/78 تا 0/68
SAT	0/71	0/03	0/76 تا 0/66
DEF	0/64	0/03	0/69 تا 0/58
SAM	0/79	0/03	0/83 تا 0/74
RAP	0/66	0/03	0/72 تا 0/61
FVA	0/60	0/04	0/65 تا 0/54
FVOD	0/99	0/006	0/99 تا 0/98
FAM	0/73	0/03	0/78 تا 0/68
COR	0/78	0/03	0/83 تا 0/73
SASSI	0/97	07/01	0/98 تا 0/94

Sensitivity analysis

Scale	Optimal cut-point	Sensitivity	Specificity	Positive Likelihood ratio	Negative Likelihood ratio
SYM	> 2	%84/3	%92/5	11/28	0/17
OAT	> 4	%74/5	%62/1	1/97	0/41
SAT	> 2	%69/6	%67/3	2/13	0/45
DEF	≤ 5	%75/5	%44/9	1/37	0/55
SAM	> 6	%77/5	%65/4	2/24	0/34
RAP	> 0	%61/8	%67/8	1/92	0/56
FVA	> 2	%23/5	%97/5	9/27	0/78
FVOD	> 1	%98/0	%97/5	38/62	0/02
FAM	≤ 9	%84/3	%49/1	1/66	0/32
COR	>4	%71/6	%73/4	2/69	0/39
SASSI	> 26	%90/2	%94/9	17/55	0/1

4.Discussion

Acording to chronbach's alpha, SASSI-3 show opportune reliability totaly. direct scales(FVOD,FVA&SYM) show higher rate of internal consistency and subtle scalesshow lower rate of internal consistency. This findings are similar to Miller & Lazawsky(1999), Clements(2002) & Laux et al.(2005).

Correlation results between SASSI-3 scales and also SASSI-3 show convergence of SASSI-3 at measurement of single phenomenon.the positive correlation of SASSI-3 and AAS show opportune convergent validity.this findings are convergent with the results Risberg et al.(1995), that has supported SASSI-3 validity by finding strong correlation between the scales of SASSI-3 and MMPI.The difference of t-test scores of students and addicted patients on SASSI-3 and the difference of main effect of group variable on SASSI-3 scales between students and addicted patients acording to multi-variat analysis of variance (MANOVA), show opportune discriminant validity.

A_z (Discriminant index) of 0/97 for SASSI-3 show opportune diagnostic validity because usually, $A_z > 0/90$ consider as approprite index. (A_z FVOD= 0/99, A_z SYM =0/95). Sensitivity and specificity of SASSI-3 was %90.2 and %94/9, thus SASSI-3 show opportune discriminant validity.

This results are consonant with Miller & Lazawski 's researches (1999), that has reported in guidance book of SASSI-3 (Sensivity = %90.2 & specificity =%94/9).

Teslak (2000), Pearson (2000), Arenth et al. (2001), opposite of our research, haven't found, opportune pychometrics properties for SASSI-3. of course, it's justifiable because, they use SASSI-3 in psychotic population. Finally, the results of recent research suggest that, SASSI-3, probably isn't able to assess all problems of patients that receive dual-diagnosis. thus before using SASSI-3 for psychotic populations, it's better to revise it's questions for eliminatting obscuries in questions for psychotics. Acording to our research, SASSI-3 is a powerful inventory for evaluating substance abuse in normal population and it's valid and reliable in Iran.

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