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## Measurement of Mental Health in Substance Use Disorder Outpatients

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### Abstract

Few studies have examined mental health (MH) attributes of substance use disorder (SUD) patients. The present study examines the internal consistency, concurrent validity, and comparative level of MH attributes (i.e., optimism, life attitudes, spirituality/religiousness, social support, positive mood, hope, and vitality) in SUD patients compared to the instrument development group. The internal consistency of optimism, spirituality/religiousness, positive mood, hope, and vitality were similar in both groups. Some subscales of the social support and life attitude measures had lower internal consistency than was found for the original samples, although internal consistency of more global constructs were comparable. SUD patients had higher positive mood, spirituality/religiousness, and hope scores, while social support, life attitudes, and optimism scores were lower than in the original sample. Correlations between MH attributes and recent life problems of SUD patients generally supported the concurrent validity of the MH measures.

### Keywords

Mental health measurement; SUD patients; psychometric properties

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Positive psychology is a greatly expanding field with increased numbers of positive attributes being considered, delineated, and researched (Lopez & Snyder, 2009). There is currently no fully agreed upon conceptual framework to describe the various dimensions of mental health (MH). One system that has begun to gain support was formulated by Keyes (2005, 2007) and includes three primary dimensions – emotional, psychological, and social. Keyes (2005, 2007, 2009) has argued that MH is a distinctive dimension from mental illness (MI) and in a confirmatory factor analyses (CFA) of MH and MI (Keyes, 2005) measures found them to be relatively independent dimensions. A recent study by our group (Alterman, Cacciola, Ivey, Coviello, Lynch, Dugosh, & Habing, submitted paper) in outpatients with substance use disorders (SUD), using both exploratory factor analysis (EFA) and CFA, obtained findings consistent with this conclusion. Importantly, literature has shown that MH attributes such as

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optimism, positive mood, and social networks have important positive implications for physical illness independent of the effects of MH states such as depression, anxiety, or hostility (Carver, et al., 2009; Cohen & Janicki-Deverts, 2009; Pressman & Cohen, 2005; Taylor & Stanton, 2007).

While the burgeoning field of positive psychology has developed measures and examined the characteristics of an increasing number of attributes of MH (Lopez & Snyder, 2009), measures of MH have been utilized relatively infrequently in clinical research on SUD patients. In one study, Strack, Carver, and Blaney (1987) found that optimism, as measured by the Life Orientation Test (LOT; Scheier & Carver, 1985), was a significant predictor of completion of an aftercare program in alcohol dependent patients. In another, Nicholson and colleagues (Nicholson, Higgins, Turner, James, Stickle, & Pruitt, 1994) compared various measures of life attitudes, including personal meaning, as measured by the revised Life Attitude Profile (LAP-R; Reker, 1992), and found that SUD inpatients generally scored lower than a non-substance abusing control group. Booth et al (Booth, Russell, Yates, Laughlin, Brown, & Reed, 1992a) used the Social Provisions Scales (SPS; Cutrona & Russell, 1987) to measure social support and found that reduced Total Social Support among male alcoholic patients significantly predicted depression during treatment. In a later study, Booth and colleagues (Booth, Russell, Sousek, & Laughlin, 1992b) found that 1 of the SPS subscales, Reassurance of Worth, was predictive of time to readmission in male alcoholic patients. Booth et al (1992a) also reported alpha coefficients ranging from 0.52–0.85 for the 6 SPS subscales and an alpha of 0.86 for the Total score. The Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988) was used by Davidson et al. (Davidson, Palfai, Bird, & Swift, 1999) to assess positive mood in alcoholic patients. They found that positive mood was significantly lower when research participants were medicated with naltrexone as compared to placebo. Thus, there is some indication that MH attributes of SUD patients may have implications for their treatment response.

In the current study we assessed a number of attributes of MH in a relatively large group of inner city SUD outpatients shortly after their intake to treatment. These attributes included the 4 just described (i.e., optimism, life attitudes, social support, and positive mood), and 3 others - spirituality/religiousness, hope, and subjective vitality. The choice of measures for the current study was based on their prior use with SUD samples as well as their coverage of attributes such as spirituality/religiousness or hope which are associated with the dominant self help group treatment emphasis typically found in most programs. Based on Keyes' (2005, 2007) conceptualization of MH as having 3 dimensions, positive mood and vitality reflect the emotional dimension; optimism, personal meaning, spirituality/religiousness, and hope reflect the psychological dimension; and social support taps the social dimension. The present study addressed 3 questions in attempting to evaluate the psychometric integrity of the range of MH measures in SUD patients. First, does the internal consistency of the measures of MH in SUD patients compare favorably with that obtained for the sample(s) on which the instrument was developed? In selecting this latter comparison group, our objective was not to provide a definitive characterization of the relative psychometric characteristics of the study measures in SUD patients, but to provide some general guidance concerning their suitability for use in SUD patients. Second, how does the level of MH in SUD patients compare with that found in the sample(s) on which the instrument were developed. Given the manifest problems of SUD patients, it was anticipated that they generally would report lower levels of MH. Finally, would there be evidence for concurrent validity of the MH measures? Concurrent validity was evaluated by comparing the measures against recent alcohol, drug, psychiatric, and family/social problems with which they were expected to bear some relationship, and legal, employment, and medical problems where lower relationships were anticipated.

## Methods

### Participants

The research participants were 484 SUD patients who had entered intensive outpatient treatment in 4 publicly funded community substance treatment programs within the past week. Few exclusionary criteria were applied. Only those candidates clearly unable to provide reliable information based on inadequate reading ability, cognitive problems, or active psychosis were excluded. The project was approved by both the University of Pennsylvania and City of Philadelphia Internal Review Boards (IRBs) and full informed consent was obtained from all participants. The average age of participants was in the late 30s ( $M = 38.35$ ;  $SD = 9.39$ ) and they had completed an average of 11.61 ( $SD = 1.88$ ) years of education. About 70% were male (69.4%), and 65.4% were African American, 26.2% Caucasian, and 7.1% were of Hispanic background. The primary substances of abuse reported in this sample were a combination of alcohol and other drugs (60.5%), polydrug (19.2%) and cocaine (8.3%) abuse. The large majority of patients (77.7%) had prior treatment for drug abuse and nearly half (47.5%) had prior treatment for alcohol abuse. About 5 in 6 (83.5%) had not been employed in the past 30 days, 43.2% were on probation and only 10.1% were currently married.

### Assessments

The MH measures included in the study were administered in conjunction with a number of other measures. The full battery of assessments took about 90 minutes to complete while administration time for the MH measures was approximately 20–30 minutes. The MH assessments were administered via self-report paper-and-pencil questionnaires under the supervision of a trained research technician. The Addiction Severity Index (ASI; McLellan, Luborsky, Cacciola, Griffith, Evans, Barr, & O'Brien, 1985) semi-structured interview was administered during the same session by a trained research technician and yielded measures of the recent problem severity (called composite scores or CSs) of a number of areas of life functioning.

### MH Measures

These measures assessed a range of attributes including optimism, life attitudes, spirituality/religiousness, social support, positive mood, hope, and subjective vitality.

### Life Orientation Test (LOT)

Optimism as defined in the LOT is a mental attitude or life orientation (e.g., 'I always look on the bright side of things.'). The 12-item LOT instrument, developed by Scheier and Carver (1985), consists of 8 active and 4 filler items. The 5-point response scale ranges from Strongly Agree (4) to Strongly Disagree (0). Higher scores on this measure indicate greater optimism. There is considerable data supporting the validity of this instrument (Scheier & Carver, 1992). People higher in optimism have better physical health (Scheier & Carver, 1992) and respond more favorably to physical illness (Scheier, et al 1989; Taylor, 1983).

### Life Attitudes

Reker's 48-item Life Attitude Profile-Revised (LAP-R; 1992) was used to assess a 6 life attitude dimensions (8 items each). These 6 dimensions include Purpose (PU), Coherence (CO), Choice/Responsibility (CR), Death Acceptance (DA), Existential Vacuum (EV), and Goal Seeking (GS). Several composite indices can be derived including the Personal Meaning Index (PMI) which is the product of the combination of the PU and CO scales and was used as a summary measure in some of the study's analyses.

The psychometric characteristics (internal reliability, stability, factorial) of the LAP-R are strong (Reker, 1992). For example, the internal consistency of the CO scale ranged from 0.81–0.84 for different age groups and men versus women and 4-to-6 week reliability (stability) was 0.85. Its validity has been demonstrated in a number of studies (Reker, 1992).

### **Ironson-Woods Spirituality/Religiousness Index –Short Form (S/R Index)**

This 25-item instrument assesses 4 dimensions of S/R – Sense of Peace, Faith in God, Religious Behavior, Compassionate View of Others (Ironson, Solomon, Balbin, O’Clerigh, George, Kumar, Larson, & Woods, 2002) and was developed using a group consisting of 200 people who were HIV+ and 79 long term AIDS survivors. All items are descriptive statements (e.g., My beliefs give me a sense of peace) are worded positively and measured on a 5 point (1- Strongly Disagree; 5- Strongly Agree) response scale with higher scores indicative of greater S/R. A total score can also be computed based on the sum of the scores of all of the items.

The internal consistency for the entire instrument was determined to be quite high (0.96) as were those for each of the 4 subscales (0.85–0.94). Test-retest reliability (stability) after 18 months was found to be 0.88 for the entire instrument and ranged from 0.54 to 0.78 for the subscales. The scale’s validity has been demonstrated in a number of ways (convergent, discriminant, construct). To our knowledge, this instrument has not been used with SUD patients.

### **Social Support**

The Social Provisions Scales (SPS; Cutrona & Russell, 1987) consists of 24 items in total, 4 items (2 positively worded and 2 negatively worded) tapping each of 6 dimensions – Guidance, (advice or information), Reliable Alliance (assurance that others can be counted on in times of stress), Reassurance of Worth (recognition of one’s competence), Opportunity for Nurturance (feeling needed by others/providing assistance to others), Attachment (emotional closeness), and Social Integration (a sense of belonging to a group of friends). A Total Social Support score can also be computed. A 4-point response scale is used throughout – 1 = Strongly Disagree; 5 = Strongly Agree. Coefficient alphas for the 6 subscales range from 0.65 to 0.76 and that for the total instrument was 0.92. The factor structure of the instrument was supported by confirmatory factor analysis and discriminant validity of the instrument has been demonstrated in a number of studies with different populations and with samples exposed to different experimental conditions (Cutrona & Russell, 1987). The SPS is unique in yielding a measure of positive social functioning not limited to specific social relationships, e.g., spousal, familial, etc.

### **Positive Mood**

Positive mood was assessed using the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). The PANAS is a 20-item self-report questionnaire which taps both positive mood (10-items) and negative mood (10-items). The items ultimately included in both the positive and negative subscales of the PANAS were those which were determined to load exclusively on either the positive or negative mood dimension in exploratory factor analyses. The PANAS has been shown to have strong psychometric properties (internal consistency; stability). The correlation between the positive and negative subscales was reported as ranging between –0.12 to –0.23 (for different rating time periods). The PANAS’ validity has been demonstrated in a number of studies (MacKinnon, Jorm, Christensen, Korten, Jacomb, & Rodgers, 1999). The reference timeframe used in the current study was the ‘past few days’.

## State Hope

This instrument consists of 12 items (8 active and 4 fillers). Both internal consistency and temporal stability have been found to be good. The instrument has been shown to encompass 2 factors, Pathway (belief in ability to generate workable routes to goals and Agency (motivation to move along the imagined route to a goal). This factor structure has been supported in 8 independent studies and convergent, discriminant, and construct validity have been demonstrated (Snyder, Harris, Anderson, Holleran, Irving, Sigmon, et al., 1991; Snyder, Sympton, Ybasco, Borders, Babyak, & Higgins, 1996). A total Hope score can also be derived. This measure has not been previously used with SUD patients.

## Subjective Vitality

This attribute was measured by a 6-item scale (Bostic, Rubio, & Hood, 2000). The instrument has been shown to have good internal reliability and its factorial integrity has been demonstrated (Bostic, et al., 2000; Ryan & Frederick, 1997). It has been found to be appropriately related to other measures of well being such as self esteem or self-actualization, and inversely related to psychopathology (e.g., depression). This measure has not been previously used with SUD patients.

## Results

### Data Analysis

The internal consistencies of the 7 measures of MH in our SUD sample and the original instrument development sample(s) were evaluated with regard to guidelines of acceptability described by Nunnally (1978). The absolute values for the different measures and their subscales were compared for the SUD sample and the original sample using a 2-sample t-test. Because the sample size was in most cases quite large, effect sizes ( $d'$  statistic) were also determined to help contextualize the probability findings applying the guidelines described by Cohen (1988). Finally, the Pearson  $r$  correlation was used to evaluate the concurrent relationships between the total score or other global construct representing the 7 MH measures and recent problem severity in the 7 life areas assessed by the ASI.

### Internal Consistency of the MH Measures

The internal consistency of the measures of MH are shown in Table 1 for our SUD outpatient sample and the original sample(s). Nunnally (1978) has suggested that a coefficient of 0.70 be taken as the lower threshold of acceptability for a scale's internal consistency. The LOT measure of optimism had a standardized alpha value of 0.73 for both the original sample of undergraduate college students and our SUD sample.

While all of the alpha coefficients for the 6 LAP-R scales as well as the PMI were quite good in the instrument's original community sample, internal consistency was not as high for several of the LAP-R scales in the SUD sample. Slightly below acceptable values of 0.67, 0.66, and 0.64 for the CR, EV, and GS scales were obtained, respectively, suggesting that the items in these scales were less cohesive in our sample. Internal consistency was excellent for the broader PMI measure.

Spirituality/religiousness, measured by the Ironson-Woods Index, had outstanding and quite similar internal consistency for the 4 subscales and the total score for both our SUD sample and for the original sample of HIV+ and AIDS survivors. Alpha ranged from 0.86–0.94 for SUD patients and 0.85–0.94 for the instrument development sample. The alphas for the Total score of both these samples were 0.96.

Four of the 6 scales in the SPS had internal consistency slightly below acceptability for the original sample of undergraduates (66.0%), teachers (16.9%), and nurses (17.1%). The standardized alpha coefficient was 0.65 for the Reliable Alliance scale, 0.66 for the Reassurance of Worth scale, 0.66 for the Opportunity for Nurturance scale, and 0.67 for the Social Integration scale. However, internal consistency was quite high for the Total instrument (0.92). By contrast, the only scale with fully acceptable internal consistency for SUD sample was the Guidance scale with an alpha of 0.71. The alpha of 0.54 obtained for the Nurturance scale certainly raises questions concerning the cohesiveness of this scale's items for our study sample. At the same time, an excellent alpha coefficient of 0.88 was found for the Total SPS score. The internal consistency findings in our sample were relatively similar to those reported previously by Booth et al (1992b).

Internal consistency was identical (0.88) for the PANAS positive mood scale for the original sample of mostly college undergraduates and our SUD patient sample. Internal consistency for both the Agency scale of the Hope measure and the Hope total score were adequate for both samples; however, that for the Pathways scale were not entirely satisfactory for both the SUD (0.63) and original sample (0.65). Finally, internal consistency was quite excellent for the measure of Subjective Vitality in our sample and was slightly higher than that obtained for 2 samples of college students (Bostic, Rubio, & Hood, 2000).

### Levels of Mental Health (see Table 1)

SUD patients reported less optimism ( $p = .0001$ ) than either male or female college undergraduates on whom the LOT instrument was developed. Using the guideline of a  $d$  value of 0.2 as indication of a small effect, a value of 0.5 as a medium effect, and 0.8 as a large effect (Cohen, 1988), the effect size of  $-0.64$  is in the moderate range.

SUD patients generally also had lower scores on the LAP-R measures. They had significantly lower scores on the PU scale ( $p = .0001$ ) which refers to having life goals and a mission in life, but not on the CO scale ( $p = 0.35$ ). They perceived less freedom to make life choices and control of life events, as reflected by the CR scale, and they had markedly higher scores on the EV scale reflective of boredom, apathy, or feelings of indifference ( $d = 1.34$ ). While their perception of personal meaning, i.e., PMI, was lower in SUD patients than in the original instrument development sample, this effect was relatively small ( $d = -0.23$ ).

SUD patients reported considerably less social support on 6 of the 7 SPS scales: Guidance, Reassurance of Worth, Reliable Alliance, Opportunity for Nurturance, Attachment, and Social. All of these group differences were in the moderate to large effect size range. Subjective Vitality was slightly higher in 1 of the 2 independent control samples of Introductory Psychology students than for the SUD patients ( $p = .007$ ;  $d = -0.21$ ).

SUD patients reported being somewhat more spiritual/religious than the original sample of HIV+/AIDS survivors, although the effect sizes for the different subscales and total score were in the low range and there were no significant group differences on the Sense of Peace subscale. The scores of SUD patients were also significantly higher on positive mood than the comparison sample of college students or college employees ( $p = .019$ ), although the effect size was quite small ( $d = 0.13$ ). Finally, SUD patients reported markedly higher levels of hope than the college student comparison group. Cohen's  $d$  score for the Total Hope score was 1.41. As previously noted, our hope measure assesses the motivation and perceived ability to achieve goals.



## Concurrent Validity Findings

Table 2 shows the correlations between the various measures of MH and the 7 ASI-based measures of recent problem severity in 7 areas of life functioning. As would be expected, higher negative correlations were found between the various MH measures and alcohol, drug, psychiatric, and family-social problems than for their relationships with legal, employment, or medical problems. These findings provide some support for the validity of the MH health measures in the study's SUD sample. It is of interest that the highest correlation for all 7 MH measures was found with the ASI's psychiatric CS. Of the 7 MH measures, lower vitality and optimism appeared to be most highly associated with recent alcohol, drug, psychiatric, and family-social problems.

## Discussion

This study compared the internal consistency and score levels of 7 measures of MH in SUD patients with that of the instrument development samples. These measures included optimism, reflected in the LOT measure as a mental attitude or life orientation, a life attitudes profile (LAP-R), i.e., purpose, coherence, etc., spirituality/religiousness (S/R index), social support (SPS), positive mood (PANAS), hope, operationalized as the motivation and perceived ability to achieve goals, and vitality.

Reliability, measured by Cronbach's alpha coefficient (i.e., internal consistency), was found to be as satisfactory in SUD outpatients as in the original instrument development sample for spirituality/religiousness, vitality, positive mood, hope, and optimism. It was clearly not as adequate for SUD outpatients for some of the SPS social support subscales. We would recommend using the Total score of the SPS when using this instrument with SUD patients. Although the reliability of several of the individual LAP-R subscales were slightly below 0.70, their use still appears to be justified in SUD patients. Another alternative is using a more reliable composite measure such as the PMI for SUD patients. In general, the study findings on instrument reliability supported the use of MH measures for SUD patients.

The level of spirituality/religiousness was somewhat higher in our SUD sample than in the original sample of HIV+/AIDS survivors. However, in interpreting the probability findings, it is necessary to take into account the study's large sample sizes since, as noted, the effects sizes were small on this attribute. It is important to also keep in mind that spirituality/religiousness is reinforced by self help groups that play a large role in the treatment and recovery process of SUD patients and also tends to be a significant factor in the lives of African Americans who represented 2/3 of the study sample. Hope was considerably higher and positive mood modestly higher in the study sample than in the college student comparison groups. These latter findings were somewhat surprising, although the patients' involvement in treatment may have served to enhance their motivation and perceived ability to achieve goals.

By contrast, and as might be expected, most of the LAP-R scale scores indicated poorer MH for our sample than for a community sample. The EV scale, a measure of boredom, apathy, or feelings of indifference provided a particularly telling picture of the poor MH of our study sample vis a vis the instrument development sample. Thus, despite higher self reported spirituality/religiousness and the perceived ability to achieve life goals, i.e., hope, our study sample was quite lacking in a sense of self. Social support was uniformly lower for SUD patients than for college undergraduates. Optimism, or a disposition toward seeing a positive side in life, was also lower compared to college students. The findings for these 3 measures are not surprising given the more problematic life histories and current circumstances of many SUD individuals

Finally, the study's findings that the relationships between the 7 MH measures and recent alcohol, drug, psychiatric, and family-social problems was consistently higher than that with recent legal, employment, and medical problems supports the concurrent validity of the 7 MH measures in the study's SUD outpatient sample. In this regard, it should be pointed out that while the relationship between the SPS total score and the ASI's family-social CS was not as high as one might initially anticipate, the two measures are quite different with the former assessing a number of forms of social support unrelated to the nature of the social relationship and the latter specific problems with family and friends. It is of interest also that the MH measures were most highly related (in an inverse direction) to recent psychiatric problems than to any of the measures of recent life problems. This would be anticipated since most of the MH measures tap what could broadly be considered psychological characteristics, psychological and emotional attributes. Although all of the measures of MH were inversely correlated with the severity of recent alcohol and drug problems, the findings revealed that these relationships were not high for a group of individuals in the acute phase of treatment. Whether MH bears a higher relationship to alcohol and drug problem severity in individuals in a latter stage of treatment and recovery is an important question to pursue further. In summary, the study findings revealing generally adequate reliability of the MH measures for SUD patients. The internal consistencies and levels of MH in SUD patients vis a vis the community-based groups on whom the instruments were developed, the concurrent validity evidence found in this study, as well as prior validity data on four of the study measures, appear to support the further investigation of MH measures towards understanding the characteristics of SUD patients that may have clinical utility.

In interpreting the findings, it should be kept in mind that the study's SUD patients and the community comparison groups, against which they were compared differed on a number of background and socio-demographic characteristics such as educational level, economic status, age, racial composition, additional psychopathology and so on which could have influenced the findings in addition to the substance abuse problems and associated treatment which the SUD patients were undergoing. It is also important to emphasize that while the study's SUD sample represents a large subset of those receiving treatment in the United States its findings may not generalize entirely to patients with other background characteristics or to those receiving a form of treatment that does not emphasize the self help group approach.

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**Table 1**  
Mental Health Scores and Internal Consistency in Substance Dependent Patients versus Original Instrument Sample

Variable	SUD Group				Control				Effect Size <sup>b</sup>	SS <sup>*</sup>
	N	Std. Alpha <sup>a</sup>	Mean	SD	Std Alpha	Mean	SD	2 sample t-test		
<b>LOT<sup>*</sup></b>	480	0.73	17.87	5.35	0.73	21.03	4.56	t = 8.99, p = .0001	-0.64	357 male undergraduates
						21.41	5.32	t = 8.68, p = .0001	-0.66	267 female undergraduates
<b>LAP-R<sup>*</sup></b>										
PU <sup>*</sup>	478	0.80	35.91	9.58	0.87	40.32	8.46	t = 5.78, p = .0001	-0.49	age 25-44 community
CO <sup>*</sup>	478	0.81	39.85	8.75	0.84	39.18	8.47	t = 0.94, p = 0.35	0.08	sample of 212 people
CR <sup>*</sup>	478	0.67	42.81	7.65	0.78	45.03	6.09	t = 3.73, p = .0002	-0.30	
DA <sup>*</sup>	478	0.79	35.97	10.28	0.83	35.29	8.89	t = 0.83, p = 0.40	0.07	
EV <sup>*</sup>	476	0.66	36.65	8.16	0.80	25.39	8.75	t = 16.35, p = .0001	1.34	
GS <sup>*</sup>	478	0.64	44.60	6.00	0.77	41.32	7.07	t = 6.26, p = .0001	0.50	
PMI <sup>*</sup>	478	0.88	75.76	16.92	0.91	79.51	15.91	t = 2.73, p = .0064	-0.23	
<b>S/R Index<sup>*</sup></b>										79 AIDS survivors
SOP <sup>*</sup>	481	0.94	36.14	8.48	0.94	35.78	9.35	t = 0.49, p = 0.62	0.04	200 people with HIV+
FIG <sup>*</sup>	483	0.91	25.45	5.53	0.93	23.64	6.75	t = 3.64, p = .0003	0.29	
RB <sup>*</sup>	483	0.86	17.76	5.43	0.85	15.94	6.00	t = 3.86, p = .0001	0.32	
CVOO <sup>*</sup>	482	0.90	20.92	4.43	0.87	19.89	4.31	t = 2.79, p = .0055	0.24	
TTS <sup>*</sup>	480	0.96	100.29	21.19	0.96	95.25	20.77	t = 2.84, p = .0046	0.24	
<b>SFS<sup>*</sup></b>										
G <sup>*</sup>	482	0.71	12.98	2.66	0.76	14.18	2.23	t = 10.05, p = .0001	-0.49	1183 undergraduates,
RA <sup>*</sup>	483	0.66	12.98	2.47	0.65	14.43	1.91	t = 13.85, p = .0001	-0.66	303 teachers,
ROW <sup>*</sup>	483	0.50	11.48	2.30	0.66	13.29	2.02	t = 16.95, p = .0001	-0.84	306 nurses.
OEN <sup>*</sup>	483	0.54	11.54	2.46	0.66	12.82	2.28	t = 10.76, p = .0001	-0.54	
ATT <sup>*</sup>	483	0.63	11.82	2.59	0.75	13.72	2.42	t = 15.08, p = .0001	-0.76	
SI <sup>*</sup>	481	0.64	12.29	2.38	0.67	14.01	1.90	t = 16.66, p = .0001	-0.80	

Variable	SUD Group						Effect Size <sup>b</sup>	SS*		
	N	Std. Alpha <sup>a</sup>	Mean	SD	Std Alpha	Mean			SD	2 sample t-test
TSS*	480	0.88	73.09	11.25	0.92	82.45	9.89	t = 17.87, p = .0001	-0.88	
Mood*	478	0.88	34.31	8.70	0.88	33.30	7.20	t = 2.35, p = .0187	0.13	952 college students, 50 college employees
<b>Hope</b>										
PATH*	481	0.63	17.61	4.55	0.65	12.81	1.75	t = 22.69, p = .0001	1.39	955 college students
AG*	481	0.74	16.78	5.10	0.71	12.83	1.69	t = 21.69, p = .0001	1.04	
TS*	481	0.76	34.38	8.29	0.76	25.64	2.93	t = 29.17, p = .0001	1.41	
VIT*	483	0.91	30.38	8.84	0.83	31.98	5.62	t = 2.71, p = .007	-0.22	276 college students
					0.89	31.16	6.29	t = 1.26, p = 0.21	-0.10	259 college students

\* LOT = Life Orientation Test (optimism). LAP-R = Life Attitude Profile Revised; PU = purpose scale; CO = coherence scale; CR = choice/responsibleness scale; DA = death acceptance; EV = existence vacuum; GS = goal seeking; PMI = personal meaning index. S/R index = Spirituality/Religiousness Index; SOP = Sense of Peace scale; FIG = faith in God; RB = religious behavior; CVOO = compassionate view of others; TS = total score. Mood = PANAS positive mood. SPS = Social Provisions Scale; G = guidance; RA = reliable alliance; OFN = opportunity for nurturance; ATT = attachment; SI = social integration. PATH = hope pathway subscale; AG = hope agency subscale; TS = total Hope score. VIT = vitality.

<sup>a</sup> standardized alpha

<sup>b</sup> Cohen's d statistic

**Table 2**

Relationship between Mental Health Measures and Recent Addiction Severity Index (ASI) Problem Severity<sup>c</sup>

Mental Health Measures	ALC	DR	PSY	F-S	LEG	EMP	MED
	CS <sup>a</sup>	CS <sup>a</sup>	CS <sup>a</sup>	CS <sup>a</sup>	CS <sup>a</sup>	CS <sup>a</sup>	CS <sup>a</sup>
LOT*	-0.18	-0.21	-0.40	-0.24	-0.06	-0.02	-0.09
PMI*	-0.13	-0.18	-0.29	-0.24	-0.04	0.08	-0.10
S/R Index*	-0.08	-0.20	-0.24	-0.10	-0.12	0.12	-0.02
SFS*	-0.15	-0.09	-0.31	-0.16	0.08	-0.08	-0.13
PANAS*	-0.14	-0.13	-0.31	-0.18	-0.01	-0.01	-0.12
HOPE	-0.14	-0.15	-0.26	-0.22	-0.02	0.05	-0.12
VIT*	-0.24	-0.20	-0.43	-0.22	0.02	0.06	-0.12

<sup>a</sup>CS = composite score. ALC = alcohol; DR = drug; PSY = psychiatric; F-S = family-social; LEG = legal; EMP = employment; MED = medical.

\*LOT = Life Orientation Test (optimism); PMI = personal meaning index of Life Attitude Profile -Revised; S/R Index = Spirituality/Religiosity Index Total Score; SPS = Social Provisions Scales Total Score; PANAS = Positive and Negative Affect Schedule Positive Mood; VIT = Vitality.

<sup>c</sup>a correlation of .088 = p <.05; r of .115 = p<.01; and r of .19 = p <.001.