Published in final edited form as:
Pers Individ Dif. 2010 December 1; 49(8): 880–884. doi:10.1016/j.paid.2010.07.022.

Relationship of Mental Health and Illness in Substance Abuse Patients

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Abstract

This study examined the latent structure of a number of measures of mental health (MH) and mental illness (MI) in substance use disorder outpatients to determine whether they represent two independent dimensions, as Keyes (2005) found in a community sample. Seven aspects of MI assessed were assessed - optimism, personal meaning, spirituality/religiosity, social support, positive mood, hope, and vitality. MI was assessed with two measures of negative psychological moods/states, a measure of antisociality, and the Addiction Severity Index's recent psychiatric and family-social problem scores. Correlational and exploratory factor analyses revealed that MH and MI appear to reflect two independent, but correlated, constructs. However, optimism and social support had relatively high loadings on both factors. Antisociality and the family-social problem score failed to load significantly on the MI factor. Confirmatory factor analysis supported the existence of two obliquely related, negatively correlated dimensions. Study findings, although generally supporting the independence of MH and MI, suggest that the specific answers to this question may be influenced by the constructs and assessments used to measure them.

BACKGROUND

Until recently mental illness (MI) and mental health (MH) have been considered to be bipolar extremes of the same underlying dimension (Insel & Scolnick, 2006; Keyes, 2007; Pressman & Cohen, 2005). This viewpoint has begun to be questioned. There is now some indication that positive and negative aspects of psychological experience are mediated by different psychological systems (Keyes, 2007, 2009; MacLeod & Moore, 2000; Pressman & Cohen,

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2005). Negative and positive emotions, attributes, and cognitions have been found to be only moderately correlated (Keyes & Lopez, 2001; MacLeod & Moore, 2000). Thus, low levels of a MI characteristic such as depression does not guarantee high levels of an MH characteristic such as optimism. Various combinations of both MI and MH are possible (Keyes & Lopez, 2001; Keyes, 2007). Thus, the psychological treatment of clients may need to take into account the level and characteristics of MH as well as those of MI.

There has also been increased focus on the relationship between MH attributes and medical illness (Cohen & Janicki-Deverts, 2009; Pressman & Cohen, 2005; Taylor & Stanton, 2007). Literature has shown that MH attributes such as optimism, positive mood, and social networks have important positive implications for physical illness independent of the effects of MI states such as depression, anxiety, or hostility (Carver, et al., 2009; Cohen & Janicki-Deverts, 2009; Pressman & Cohen, 2005; Taylor & Stanton, 2007).

Increased numbers of MH attributes are being delineated and researched (Lopez & Snyder, 2009). There is currently no agreed upon conceptual framework to describe the various dimensions of 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 MI. In support of this conceptualization, he conducted the first latent structure analysis of MH and MI (Keyes, 2005) using data of 3032 participants in the Midlife in the United States survey (MIDUS). The psychological dimension of MH was measured using Ryff's (1989) scales of psychological well being; the social dimension by Keyes' (1998) scales of social well-being, and the emotional dimension by a brief instrument developed for the study. Measures of MI were confined to the psychological dimension and included the number of depression, generalized anxiety, panic attack, and alcohol dependence symptoms derived from the Composite International Diagnostic Interview –Short Form (Kessler, et al., 1998). Confirmatory factor analyses (CFAs) indicated that a two factor oblique model provided the best solution. Keyes (2007, 2009) has affirmed his conceptualization of MH and MI as being independent dimensions in subsequent reports. Nonetheless, no further latent structure analyses have been conducted to support this conclusion. Importantly, the independent dimensionality of MH and MI has not been demonstrated in a clinical population (Keyes, 2010).

Measures of MH have been utilized relatively infrequently in clinical research on substance use disorder (SUD). In the current study we assessed a number of MH dimensions shortly after treatment intake in a group of SUD outpatients. The dimensions included optimism, personal meaning, spirituality/religiosity, social support, positive mood, hope, and vitality. Based on Keyes' (2005, 2007) conceptualization, positive mood and vitality sample the emotional dimension, optimism, personal meaning, spirituality/religiosity, and hope the psychological dimension, and social support the social dimension. MI was assessed with measures of negative mood, psychological illness, and social interaction problems. Applying Keyes' dimensional framework, negative mood was considered to tap the emotional dimension, measures of psychological illness the psychological dimension, and social interaction problems the social dimension. The primary objective of this study was to determine whether Keyes' (2005) findings that MH and MI represent two independent dimensions could be replicated in our clinical sample.

METHODS

Participants

Participants were 484 SUD patients recently admitted to intensive outpatient treatment in four community substance abuse treatment programs. Few exclusionary criteria were applied. Only those candidates clearly unable to provide reliable information - inadequate reading ability,

cognitive problems, active psychosis - were excluded. The project was approved by the University of Pennsylvania and City of Philadelphia IRBs and full informed consent was obtained. The average age of participants was late 30s (M = 38.35; SD = 9.39) and they averaged 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 Hispanic. The primary substances of abuse were alcohol and other drugs (60.5%), polydrug (19.2%) and cocaine (8.3%). The large majority of patients (77.7%) had prior treatment for drug abuse and nearly half (47.5%) had prior treatment for alcohol abuse. Over forty percent (42.1%) had a prior psychiatric hospitalization. About five in six (83.5%) were unemployed, 43.2% were on probation, and only 10.1% were married.

Assessments

The measures of MH are described first followed by MI measures. The assessment battery took about 90 minutes to complete and was administered by a research technician via self-report questionnaires, with the exception of the Addiction Severity Index (ASI) interview.

Measures of MH

Life Orientation Test (LOT)—Optimism was assessed using the 12-item LOT instrument (Scheier & Carver, 1985). It includes eight active and four filler items. The 5-point response scale ranges from Strongly Agree (4) to Strongly Disagree (0). Higher scores indicate greater optimism. There is considerable data supporting the LOT's validity (Scheier & Carver, 1992). People higher in optimism have better physical health (Scheier & Carver, 1992) and respond more successfully to physical illness (Scheier, et al., 1989; Taylor, 1983). The LOT has been used with SUD patients. Strack et al. (1987) found that optimism in alcohol dependent patients significantly predicted aftercare treatment completion.

Personal Meaning—Reker's Life Attitude Profile-Revised (LAP-R; 1992) was used to assess personal meaning and other life attitudes. This 48-item instrument includes six subscales of eight items each and two composite indices. This study focuses on the Personal Meaning Index (PMI) composite consisting of the purpose (PU) and coherence (CO) subscales.

The psychometric characteristics of the LAP-R are strong (Reker, 1992) and its validity has been demonstrated. Internal reliability for the PMI was 0.91 (Reker, 1992) and four-to-six week reliability (stability) was 0.91.

Nicholson and colleagues (Nicholson, et al., 1994) compared the LAP-R scores of SUD inpatients and nonsubstance abusing controls and generally found lower scores for the SUD group.

Ironson-Woods Spirituality/Religiousness Index –Short Form (S/R Index)—This 25-item instrument assesses four dimensions of S/R (Ironson, et al., 2002). 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 and was used in this study.

The internal consistency for the entire instrument was determined to be quite high (0.96). and test-retest reliability after 18 months was 0.88. The scale's validity has been demonstrated in a number of ways (convergent, discriminant, construct). To our knowledge, this instrument has not been previously used with SUD patients.

Social Support—The Social Provisions Scales (SPS; Cutrona & Russell, 1987) consists of 24 items, four items (2 positively worded and 2 negatively worded) tapping each of six

dimensions. A total Social Support score can also be computed. A four point response scale is used throughout − 1 = Strongly Disagree; 5 = Strongly Agree. Coefficient alpha for the total instrument was determined to be 0.92. The factor structure was supported by confirmatory factor analysis and discriminant validity has been demonstrated in a number of studies with different populations (Cutrona & Russell, 1987).

Booth et al. (Booth, et al., 1992b) showed that a lower Total SPS score predicted depression during treatment in male alcoholic patients and also found (Booth, et al., 1992a) that one of the SPS subscales, Reassurance of Worth, predicted time to readmission in male alcoholic patients. The Total SPS score was used in the study.

Positive Mood—Positive mood was assessed using the Positive and Negative Affect Schedule (PANAS; Watson, et al., 1988). The PANAS is a 20-item self-report questionnaire assessing both positive mood (10-items) and negative mood (10-items). It has been shown to have strong psychometric properties (internal consistency; stability). Correlations between the positive and negative subscales have been reported as ranging between −0.12 to −0.23. The PANAS' validity has been demonstrated in a number of studies (Mackinnon, et al., 1999). Davidson, et al. (1999) found that PANAS positive mood was significantly lower in alcoholic patients medicated with naltrexone.

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 two factors (Pathway and Agency). Convergent, discriminant, and construct validity have been demonstrated (Snyder, et al., 1991; 1996). A total Hope score can be derived and was used in the present study. This instrument has not been previously used with SUD patients.

Vitality—This attribute was measured by a 6-item scale. 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 MH such as self esteem, self-actualization, and inversely related to MI (e.g., depression; Bostic, et al., 2000; Ryan & Frederick, 1997). It has not been previously used with SUD patients.

Measures of MI

Antisociality—The California Psychological Inventory- Socialization (CPI-So) scale is a self-report measure of childhood and adolescent socialization, social judgment, and normative behaviors which yields a summary measure of asocial/antisocial dispositions. The CPI-So contains 46 items in a binary, true-false response format, with lower scores reflecting poorer social judgment, less empathy, and less conformity with social norms. The CPI-So's psychometric properties have been shown to be excellent in a number of populations (Gough, 1994; Gough & Bradley, 1996). Several studies have shown it to have good validity in SUD patients (Alterman, et al., 1998; Cooney, et al., 1990; Kadden, et al., 1989).

Negative Mood—As described above, the PANAS also provides a measure of negative mood and served as one of the MI measures.

Profile of Mood States (POMS)—The POMS (McNair, et al., 1992) was used to assess negative moods and psychological states. The POMS is a 65-item, self-report instrument with 6 subscales: tension-anxiety, depression-dejection, anger-hostility, vigor-activity, fatigue-inertia and confusion-bewilderment. Items use a 5-point scale ranging from Not at All (0) to Extremely (4), with higher scores indicating greater negative affect. There is considerable data

to support the psychometric integrity and validity of the POMS (McNair et al., 1992). A total mood disturbance score can be derived and was used in this study.

ASI—(McLellan, et al., 1985). The ASI is a semi-structured interview yielding a multidimensional assessment of past 30 day and lifetime substance abuse problem severity in seven areas of functioning. It is administered in about 45–60 minutes by a trained technician. Summary composite scores (CSs), ranging from 0.00 (no problem) to 1.00 (maximum problem), are calculated in each area to describe problem severity during the prior 30 day period. The ASI provided sociodemographic and background information and the psychiatric and family-social CSs were used to describe recent problem severity in these areas.

Measure Reliabilities for SUD Sample—The internal consistencies of the MH measures (Alterman, Cacciola, Dugosh, Ivey, & Coviello, in press) for the SUD sample were 0.73 (LOT), 0.88 (PMI), 0.96 (S/R Index), 0.88 (SPS), 0.88 (Positive Mood), 0.76 (Hope), and 0.91 (Vitality). Those for the MI measures were 0.72 (CPI-So), 0.90 (Negative Mood), 0.82 (POMS), 0.84 (ASI Psychiatric CS), and 0.58 (ASI family-social CS).

RESULTS

Data Analysis

The relationships between the measures of MH and MI in our SUD outpatient sample were examined in several ways. First, bivariate correlations between the various measures were examined. Second, exploratory factor analysis (EFA) was undertaken to determine whether two separate dimensions would be revealed in our SUD sample. EFA was selected as the initial latent structure analysis, instead of CFA, since the dimensional structure of MH and MI attributes had not yet been established for SUD patients. Finally, CFA was conducted to determine the extent to which the EFA findings could be confirmed as well as to determine the extent of agreement between the findings of the current study and those of Keyes' (2005) CFA based study.

Correlational findings

The correlations between the various measures are described in Table 1. Since a correlation of only 0.19 yields a $p<.001$ result for the study sample of 484, statistical significance of the correlations was not provided in the table which instead selected correlations of >0.395 as indication of at least a moderate/meaningful relationship (highlighted in bold in Table 1). The findings indicated that the inter-correlations between the measures of MH generally tended to be higher than their relationships with measures of MI; and those between the measures of MI tended to be higher than their relationships with the measures of MH. However, the CPI-So and family-social CS measures did not appear to be as closely interlinked with the other three MI measures. Thus, the correlational data generally supported the conclusion that measures of MH and MI are not merely inversely correlated with each other and appear to assess somewhat independent dimensions. For example, the correlation between positive and negative mood on the PANAS was −0.20; and personal meaning (PMI) correlated at least moderately with five of the six other measures of MH, with only one moderate inverse relationship to a measure of MI. On the other hand, several of the MH measures did show substantial inverse relationships with a number of the MI measures. That is, although optimism correlated at least moderately with four of the six other measures of MH, it also had moderate inverse relationships with four of the five measures of MI. A similar pattern was shown for the correlations of social support with the other measures.

Factor Analysis of MH versus MI

An EFA was performed on the seven measures of MH and five MI measures to determine whether MH and MI represented relatively independent dimensions. The maximum likelihood (ML) method of extraction and a varimax rotation were employed. The findings revealed two factors with eigenvalues over one, accounting for 53.3% of the total variance (see Table 2). The first factor, comprised of MH measures, had an eigenvalue of 5.08 and accounted for 42.4% of the variance. When a significant loading was defined as 0.40 (i.e., >0.395), six of the seven measures of MH loaded significantly on this factor. However, optimism also loaded significantly on the second factor and as a `double loader' was excluded from the measures comprising each of the factors. Social support had a loading of 0.39 on factor 1, just short of satisfying our criterion for significant loading. However, its loading of −0.35 on the second factor almost equaled its loading on the first factor. The second factor had an eigenvalue of 1.31 and accounted for 10.9% of the total variance. It was comprised of three of the five measures of MI – POMS mood/psychological disturbance, PANAS negative mood and the ASI psychiatric CS. Neither the CPI-So nor the ASI family-social CS loaded significantly on this factor, although their loadings were higher on the second factor than on the first. The alpha coefficients for the two factors were 0.82 and 0.83, respectively. Similar solutions were revealed when the equamax and promax rotations were employed.

As a check on distortions that could occur for the ML extraction due to deviations of response distributions from normality an iterated principal axis factor analysis extraction was also undertaken and yielded findings similar to those found for the ML analysis.

The three measures that did not clearly load on either factor in the EFA were initially not included in the CFA. We considered a RMSEA estimate of 0.05 or less to be excellent and less than 0.08 to be acceptable (Browne & Cudeck, 1993). Our results were consistent with those of Keyes (2005). The model fit for a two factor model was not acceptable when the factors were not allowed to correlate (RMSEA estimate = 0.14). However, the model fit was acceptable when the factors were allowed to correlate (RMSEA estimate = 0.07). The correlation between the two factors was −0.66, again consistent with that of the correlation of −0.53 obtained by Keyes (2005). The inclusion of the three variables that were dropped based on EFA results did not change the results of the CFA significantly (RMSEA = .08, r = −0.69).

CONCLUSIONS

The findings of the current study represent the first evidence of the independent dimensionality of MH and MI in a clinical sample. This may have implications for psychological treatment. However, several limitations to this conclusion were apparent. Although most of the MH measures correlated much more highly with each other than with measures of MI, optimism and social support were generally as highly correlated (in an inverse direction) with measures of MI as they were with the other measures of MH. Similarly, in the EFA, the loadings for these two measures were essentially the same on both factors. Thus, based on these findings, it would appear that optimism and social support behaved as if they were bipolar opposites of MI.

To some extent, the differences in the behavior and relationships of some measures of MH versus others may reside in the specific construct or on the measure itself. For example, spirituality/religiosity or personal meaning are not constructs usually represented in the delineation of MI and would therefore not be likely to bear strong relationships to typical measures of MI such as anxiety or depression. On the other hand, the LOT measure of optimism has actually been shown to consist of two separate dimensions – optimism and pessimism (Herzberg, et al., 2006); the latter dimension bearing some kinship to MI constructs such as depression. The construct of social support, on the other hand, may be one that reflects MH

when it exists in adequate amounts, but may also be associated with MI when it is largely lacking. The positive and negative mood measures derived from the PANAS represent another illustration of possible relationships that may or may not exist between MH and MI. The PANAS measure (Watson, et al., 1988) was specifically constructed psychometrically so that the positive and negative mood dimensions would be essentially uncorrelated. The independence of positive and negative mood reflected by the PANAS in this study may therefore provide only limited information about the independence or non-independence of MH and MI. In summary, although our analyses generally supported the conclusion that MH and MI are independent, although correlated, dimensions, we must be cautious in our conclusions, because the findings may be partly tied to the constructs/variables and measures used.

A final finding which appears to bear some relationship to the immediately preceding discussion concerns the relatively low relationship of the CPI-So and recent family-social problem scores to the other measures of MI. While the PANAS negative mood, POMS and ASI recent psychiatric problem scores seem to reside in the domain typically described and considered to reflect MI, antisociality is represented in another dimension of MI, that of personality disorders; and family-social problems are not saliently represented within the domain of MI. These findings provide additional support for the conclusion that the results of latent structure analyses of MH versus MI may in part be influenced by the nature of the constructs and measures utilized. Thus, additional studies with other clinical samples and measures are warranted.

Acknowledgments

This research was supported by grants from the US National Institute on Alcohol Abuse and Alcoholism and the US National Institute on Drug Abuse

The authors wish to express their appreciation to Corey Keyes, Ph.D. for his many helpful suggestions.

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Table 1

Intercorrelations between Study Measures*

Measure	IW S/R	Soc. Supp.	LAP-R PMI	PANAS Pos.	Hope	Vitality	CPI-So	PANAS Neg	POMS Total	ASI Psych.	ASI F-S[b]
LOT Optimism	.36	**.40**	**.46**	**.42**	.38	**.50**	**.41**	**−.45**	**−.57**	**−.40**	−.24
Ironson-Woods (IW) S/R		.25	**.47**	.36	.36	**.52**	.26	−.27	−.34	−.24	−.10
Social Support			.28	.39	.30	**.40**	.30	−.32	**−.45**	−.31	−.16
LAP-R Personal Meaning				**.49**	**.51**	**.58**	.31	−.33	**−.41**	−.29	−.24
PANAS Positive Mood					**.44**	**.60**	.23	−.20	**−.41**	−.31	−.18
Hope						**.54**	.16	−.26	**−.41**	−.26	−.22
Vitality							.30	**−.41**	**−.55**	**−.47**	−.22
CPI-So[a]								−.31	−.38	−.32	−.17
PANAS Negative Mood									**.80**	**.47**	.27
POMS Total Score										**.58**	.32
ASI Psych composite											.33

*Correlations of .40 or higher are highlighted in bold; an r of .19 = p<.001.

[a]A lower score on this measure is indicative of more psychopathology.

[b]ASI family-social composite score

Table 2

Exploratory Factor Analysis Findings for Measures of Mental Health and Mental Illness

	Factor	
Measures	**1**	**2**
LOT Optimism	0.48	−0.48
ASI Psychiatric Composite	−0.28	0.55
CPI Socialization[a]	0.28	−0.33
PANAS Positive Mood	0.68	−0.21
PANAS Negative Mood	−0.14	0.82
POMS Mood Disturbance	−0.31	0.90
Subjective Vitality	0.76	−0.35
Spirituality-Religiousness Index	0.56	−0.18
LAP-R Personal Meaning Index	0.67	−0.24
SPS Social Support Total	0.39	−0.35
Total State Hope Score	0.58	−0.24
ASI Family-Social Composite	−0.18	0.30
Eigenvalue	5.08	1.31
% of variance	42.37	10.94
Alpha coefficient	0.82	0.83

[a]Lower CPI-scores are indicative of more antisociality.