Published in final edited form as:

J Psychoactive Drugs. 2015 ; 47(3): 187–196. doi:10.1080/02791072.2015.1053556.

Exploring the Factor Structure of a Recovery Assessment Measure among Substance-Abusing Youth

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Abstract

To date, the measurement of recovery in the field of substance abuse is limited. Youth recovery from substance abuse is an important area to consider given the complexities of such issues. The Recovery Assessment Scale (RAS) has been validated with mental health patient populations, however its measurement characteristics have not been examined for individuals in substance abuse treatment. The current study explored the factor structure of the RAS with a sample of 80 substance abusing youth who participated in a pilot aftercare study ($M_{\text{age}} = 20.5$, $SD = 3.5$; 71.3% male). Reliability analysis showed an internal consistency of $\alpha = .90$ for the entire RAS measure among the youth sample. Results of exploratory factor analysis identified the following four factors: personal determination, skills for recovery, self-control in recovery, and social support/moving beyond recovery among the substance abusing youth sample. The RAS also demonstrated sound convergent and divergent validity in comparison to other validated measures of functioning, sobriety, and wellbeing. Collectively, results support that the RAS has adequate psychometric properties for measuring recovery among substance abusing youth.

Keywords

Recovery Assessment Scale; Substance Abuse; Recovery; Psychometric Testing; Youth

INTRODUCTION

The recovery of substance abuse among youth, defined broadly as adolescents and young adults from age 10 to 25 (CDC 2010), is complex. In light of the chronic nature of substance

use disorders, understanding the process of recovery and its complexities among youth populations has been a growing interest. Traditionally, recovery within the field of addiction (for both adults and youth) has been understood as a function of abstinence or relapse outcomes; however outcome-based research with substance abuse populations has characterized recovery as a more complex process than just abstinence or relapse (Hser & Anglin 2011; Kaminer & Godley 2010; Substance Abuse Mental Health Services Administration-SAMHSA 2011).

Recent definitions of recovery have expanded to include other aspects of functioning and improvement. The Betty Ford Institute Consensus Panel (2007) has characterized the recovery concept as a lifestyle process encompassing not only sobriety, but also personal health and citizenship domains. SAMHSA (2011) has defined recovery more broadly, encompassing a subjective assessment of life in terms of the burden and impact of disease and treatment across physical and psychological functioning. Others have conceptualized recovery more as a function of strengths rather than pathologies (White & Cloud 2008) and as a process of stages or recovery paths (Groshkova, Best & White 2013). Research among substance abusing youth supports these latter views. For example, recent work by Gonzales et al. (2012a; 2012b) found that youth in substance abuse treatment tend to endorse recovery as a process of lifestyle change, asserting personal control to improve one's lifestyle using wellness-based approaches to getting healthy/healing, and having confidence in oneself to change.

The measurement of recovery within the field of mental health is more aligned with these latter views of recovery being a process of lifestyle improvement, well-being, and healing via self-management (Harding & Zahnheiser 1994; Wells, Hawkins & Catalano 1988). A commonly used measure of recovery within the mental health field is the Recovery Assessment Scale (RAS) (Giffort et al. 1995). Research on the RAS has identified a five-factor structure measuring recovery as a process of lifestyle improvement, including: personal confidence and hope, willingness to ask for help, being goal and success oriented, reliance on others, and not being dominated by symptoms (Law et al. 2012; Corrigan et al. 1999; Corrigan et al., 2004). The RAS has been shown to have strong psychometric properties for internal consistency, test-retest reliability, and inter-rater reliability across several studies measuring recovery for populations suffering from mental health disorders (Salzer & Brusilovskiy 2014).

There is no current recovery measure that has been validated with substance abusing youth. Given that the recovery of substance abuse among youth shares similarities with the RAS measurement of recovery, the current study explored the psychometric utility of the RAS for assessing recovery among a sample of substance abusing youth who participated in a recovery support aftercare pilot project.

METHOD

Participants

The sample consisted of 80 substance abusing youth who completed the RAS at admission to a recovery support aftercare pilot program called Project ESQYIR (Educating &

Supporting Inquisitive Youth in Recovery). This aftercare program consisted of a randomized, controlled pilot trial investigating a mobile-based texting aftercare intervention compared to aftercare as usual standard practice for youth transitioning out of substance abuse treatment. Study inclusion criteria included youth (identifying as adolescent or young adult) in treatment for substance abuse, completing treatment for substance abuse, willing to comply to study procedures, and providing parental consent (if under 18). Study exclusion occurred if individuals exhibited severe medical and psychiatric impairment that warranted hospitalization or further specialty treatment.

Procedures

Study procedures were approved by the Institutional Review Board (IRB) of Azusa Pacific University. Recruitment for Project ESQYIR occurred between January 2012 and July 2013 at community-based substance abuse treatment programs located in Los Angeles County, California. Research Associates (RAs) recruited youth using in-person advertisement during treatment groups and by leaving study information fliers with RA contact information with treatment staff. Youth who contacted the RA about study participation were screened for eligibility. Consent and baseline measures were administered upon completion from treatment.

Measures

The Recovery Assessment Scale (RAS) is a 41-item scale that was developed to assess recovery outcomes from mental illness disorders (Corrigan et al. 1999) using Likert scales ranging from 1 (strongly disagree) to 5 (strongly agree) (see online Supplement 12). Corrigan et al. (2004) found the RAS to have a five factor structure in a sample of adults with a mental health diagnosis, consisting of only 24 out of the 41 items: (1) personal confidence and hope, (2) willingness to ask for help, (3) goal and success orientation, (4) reliance on others, and (5) no domination by symptoms to measure recovery (see online supplement 2___ for specific items under each factor). The RAS was adapted for the pilot aftercare project such that the language related to mental illness was replaced to better reflect recovery from substance abuse. For example, questions such as “coping with my mental illness is no longer the main focus of my life” was changed to “coping with my alcohol/drug use is no longer the main focus of my life”.

Other measures used for construct validation procedures included the Brief Addiction Monitor (BAM), a measure developed to monitor patient progress of recovery from substance abuse (Cacciola et al. 2013). The BAM includes substance use, risk, and protective dimensions. The substance use dimension includes items that measure continued alcohol and drug use; the risk factor dimension measures craving, sleep problems, mood issues, risky situations, and interpersonal problems; and the protective dimension measures aspects of self-help, spirituality, work, school, and income. Research has reported strong test-retest reliability for the BAM ($ICC=0.7$) and excellent predictive validity for the substance use and risk factor dimensions ($Wald\ chi-square = 4.261; p < .05$; Cacciola et al. 2013). The Global Assessment Inventory of Needs-Short Screen (GAIN-SS) modified from the full GAIN (Dennis, Chan & Funk 2006) was also used for construct validation. The GAIN-SS includes 20 items that measure behavioral health issues (internal mental distress,

behavioral complexity, substance use problem severity, and crime/violence). The total lifetime disorder scale of the GAIN-SS is used to screen for individual severity across all behavioral health issues. Research has validated the factor structure of the GAIN-SS, showing a satisfactory fitness index in terms of GFI (.87) and a good Root Mean Square Error of Approximation (.06) (Dennis, Chan & Funk 2006). The total disorder scales (for past month and lifetime) have been shown to be highly correlated with the full GAIN scale ($r = 0.94$) (Dennis, Chan & Funk 2006). Additionally, the Drug Abstinence Self-Efficacy scale (DASE), modified from the Alcohol Abstinence Self-Efficacy scale's (AASE) (DiClemente, Fairhurst & Piotrowski 1995; DiClemente et al. 1994) was used for construct validation. The DASE includes 20-items that assess individual self-efficacy/confidence of not using alcohol or drugs in high-risk relapse situations. The reliability estimates in terms of internal consistency for both the DASE and AASE have been shown to be excellent (Cronbach's alphas = .98 and .99, respectively). Research using binary logistic regression found that the prediction percentage between self-efficacy (measured by the DASE/AASE) and avoiding substance use was 66.1% (Chavarria et al. 2012). Lastly, the Short-Form (SF-12) measure, adapted from the SF-36 (Ware, Kosinski & Gandek, 2001) was used in construct validation. The SF-12 is designed to assess perceived health status (quality of life) in terms of physical and mental health functioning using 12 items that factor into two composite scales (Physical Composite Scale-PCS and Mental Composite Scale-MCS) (Gandhi et al. 2001). The SF-12 has been validated with mental health patients, with the PCS and MCS explaining 55% of the variance in the item responses (Salyers et al. 2000).

Data Analysis

Initial analyses included reliability testing of the RAS measure to provide an overall estimate of internal consistency of the 41 items. We then used exploratory factor analysis (EFA) to determine the number of factors to be retained from the adapted RAS with the substance abusing youth sample. An EFA with varimax (orthogonal) rotation was run using the Statistical Package for Social Sciences (SPSS), version 22.0, since it is believed that the latent factors embedded in the subscales are distinct constructs. Given that Mundfrom, Shaw and Ke (2005) suggest that the minimum sample size needed to run EFA is 180, parallel analysis (PA) was performed using a syntax developed by O'Connor (2000) to compensate for the high variability of the small sample.

Although different criteria and methods have been used to identify the factor structure of a factor model (i.e., such as the Kaiser criterion (>1), the scree plot (inflection point), and PA), PA has been verified as the most accurate method (Velicer et al. 2000; Glorfeld 1995; Buja & Eyubuglu 1992; Hubbard & Allen 1987; Zwick & Velicer 1986; Humphreys & Montanelli 1975; Horn 1965). The logic of PA is similar to bootstrapping in resampling, such that the existing sample is regarded as a proxy population. The algorithm generates a set of random data correlation matrices by bootstrapping from the pseudo-population (resampling with replacement), and then the average eigenvalues and the 95th percentile eigenvalues are computed. The observed eigenvalues are then compared against the re-sampled eigenvalues. The decision criterion used is that the number of factors extracted should have eigenvalues greater than those in the random matrix (Yu et al. 2007). Using the 95th percentile of the resampled eigenvalues is equivalent to setting the alpha level to .05 in

hypothesis testing (Cho, Li & Bandalos 2009). Reliability analyses of the factors were performed. By convention, a Cronbach's alpha of more than 0.70 was used to determine the extent to which the scales are acceptable (Nunnally 1978).

Additional construct validation statistical procedures were utilized to examine convergent and discriminant validity of the RAS measure against other commonly used validated instruments that measure treatment outcomes among substance abusing populations, described in the Measures including the BAM, GAIN-SS, DASE, and SF-12. All analyses are based on an alpha level (2-tailed) set at $p < .05$ for statistical significance.

RESULTS

Participant Characteristics

Of the 80 substance abusing participants, most were male (71.3%) and identified as Caucasian (42.5%), Hispanic (37.5%), Asian/Pacific Islander (8.8%), African American (10%), and Native American/Alaskan Indian (1.3%). The mean age was 20.47 ($SD = 3.49$) years. The majority were unemployed (63.7%) and 53.2% were currently enrolled in school (half or full time). Primary drugs in treatment included: marijuana (36.3%), methamphetamine (28.7%), cocaine (16.3%), heroin (11.3%), prescriptions drugs (5.0%), and alcohol (2.5%).

Psychometric Analyses

Reliability analysis revealed a high internal consistency for the RAS as a whole ($\alpha = .90$). Figure 1 shows the results of the PA, which indicated that a four-factor structure was sufficient since the observed eigenvalue (2.38) was greater than the mean resampled eigenvalue (2.17) and the 95th percentile eigenvalue (2.29). Given these results, another EFA with varimax rotation and four-factor extraction was run. See online Supplement 3 for further detail on PA results.

Analyses from EFA resulted in a four-factor RAS structure. As shown in Table 1, Factor 1 ($\alpha = 0.86$), "Personal Determination," consists of twelve items that include hopefulness about the future, desire to succeed, and purpose in life. Factor 2 ($\alpha = 0.80$) measures "Skills for Recovery" through agreement with seven statements such as willingness to ask for help and being able to identify triggers. Factor 3 ($\alpha = 0.83$), "Self-Control in Recovery," is composed of ten items including having a plan to stay or become well, being able to handle stress, and understanding how to control one's alcohol or drug use. Factor 4 ($\alpha = 0.77$) measures "Social Support and Moving beyond Recovery" through agreement with seven items that have to do with having people to count on and personal lifestyle change (i.e., having healthy habits).

We provide comparisons of the RAS factor structure for youth in recovery from the present study (i.e., four-factor structure 36 out of 41 items) and the mental health sample by Corrigan et al. (2004) (i.e., five-factor structure consisting of 24 out of 41 items) in Table 2. As shown, items in Factor 1 of the four-factor RAS (Personal Determination) with substance abusing youth corresponded well with items from both Factor 1 (Personal Confidence and Hope) and Factor 3 (Goal and Success Orientation) of the five-factor RAS. Items from

Factor 2 (Willingness to ask for help) of the original five-factor RAS fit into Factor 2 of the four-structure RAS; however it also included five additional items (not part of the original three item factor) that had to do with skills for recovery (i.e., identifying triggers, early warning signs, knowing about services, etc.). Factor 3 of the four-factor RAS (Self Control in Recovery) corresponded well with Factor 5 of the original five-factor RAS (No Domination by Symptoms); however it also included additional items beyond two of the original items) that were also specific to symptom improvement and self-control in recovery. Lastly, Factor 4 of the four-factor RAS (Social Support and Moving beyond Recovery) corresponded well to Factor 4 of the original five-factor RAS (Reliance on Others); however it also included additional items that measured relational aspects of recovery support and did not include certain items about friends (i.e., it is important to have a variety of friends).

In evaluating convergent validity of the four-factor RAS with other standardized measures in the field commonly used to measure recovery-related outcomes (i.e., BAM – measures substance use and risk dimensions, DASE measures self-efficacy using a total score, GAIN-SS measures monthly and lifetime disorder status using total scores, and the SF-12 measures physical and mental functioning via the PCS and MCS total scores). Initially scatterplot and correlation matrices were used to observe inter-relationships. A high degree of positive correlation should be observed between measures of similar constructs, whereas in evaluating divergent validity no correlation or a high level of negative correlation should be found between measures of dissimilar constructs. When bivariate outliers were present, a density ellipse was superimposed on the scatterplot to cover 95% of the data. Overall, because bivariate outliers were present in all pairwise relationships, robust fit was employed as a remedial tool. In addition, robust parameter estimates portray the direction of the relationship (positive or negative).

We display convergent analyses using robust fit and estimates of the RAS factor structure compared to other measures (BAM, GAIN, DASE, and SF-12) among the youth sample in Table 3.

RAS & BAM Measures—All four RAS factors were negatively correlated with the BAM substance abuse domain (measuring substance use issues) ($p < .05$), showing that the RAS recovery factors and the BAM substance abuse domain are diverse constructs. However, results for the BAM risk domain (measuring problems of physical health, sleep, stress, mood, delusions, violent behavior, and cravings) with the RAS were not as clear cut. Specifically, there were negative correlations between all of the RAS factors and the BAM risk domain, however the association was only statistically significant for RAS factor 1 (personal determination).

RAS & DASE Measures—The RAS factors that were positively correlated ($p < .05$) with the DASE self-efficacy total score included Skills for Recovery (Factor 2) and Self-Control in Recovery (Factor 3), showing that the RAS recovery factors and the DASE self-efficacy total score construct are convergent constructs. Results did not yield significant associations between the DASE self-efficacy total score construct and RAS recovery factors of Personal determination (Factor 1) and Social Support (Factor 4).

RAS & GAIN-SS Measures—Results showed negative correlations between all of the RAS factors and the GAIN total disorder scales (for both past month and lifetime use, $p < .05$), indicative that the RAS recovery factors and the GAIN total disorder construct are diverse constructs.

RAS & SF-12 Measures—Results for the RAS factors and the quality of life (SF-12) physical (PCS) and mental (MCS) health measures were in the expected direction. Specifically, a higher score in perceived recovery was associated with a lower score in PCS (less perceived physical pain or hindrance) and a lower score in MCS (less perceived mental impairment). These results were significant for the MCS construct with all of the RAS factors, however for the PCS construct, only RAS factor 1 (personal determination) was significant ($p < .05$).

DISCUSSION

There is growing interest in the substance abuse treatment field with understanding recovery and how to measure it as an outcome beyond abstinence/relapse (Laudet 2011) and more as a process (White 2007), including components of well-being (Best et al. 2012), and stages of lifestyle change/improvement (White 2007), that more adequately represent diverse subgroups of substance abusers, like youth populations (Gonzales et al. 2012a). Given that research related to youth recovery show recovery to be more about improving one's behavioral lifestyle, asserting personal control, having confidence, maturity, discipline, and will power over their lives (e.g., Gonzales et al. 2012a; 2012b), we explored the psychometric properties of a recovery measure that taps into the latter definitions of recovery – using the RAS, which has been commonly used with mental health populations.

Results from the EFA and PA showed a four-factor RAS structure to adequately measure recovery outcomes among substance abusing youth, including personal determination, skills for recovery, self-control in recovery, and social support/moving beyond recovery. Previous research on the RAS with mental health populations has identified the following five factors to measure recovery among mental health populations: personal confidence and hope, willingness to ask for help, being goal and success oriented, reliance on others, and not being dominated by symptoms (Solomon et al. 2001; Corrigan et al., 1999). Given that the idea of “recovery” has been put forward as a unifying concept among those suffering from substance abuse and mental disorders, results from this study, which used a measure of recovery from mental illness, reveals that the recovery concept has slightly different meaning for youth recovering from substance abuse.

As displayed in Table 2, the RAS four-factor recovery domains for the youth sample are comparable to the original five-factor structure (with a mental health sample), with slight variations across the domains. First, the original two categories of personal confidence/hope and goal/success combined into one factor for the youth sample, broadly labeled personal determination. Second, the original factor 2 (willingness to ask for help) was important for youth in recovery, however besides “getting help from others,” other items that fit better for the youth included, for example, relying on self for improvement using “recovery skills” like identifying triggers, knowing the early warning signs for relapse, knowing about services.

Third, Factor 3 (Self Control in Recovery) for the youth sample corresponded well with Factor 5 of the original five-factor RAS (No Domination by Symptoms) both of which have to do with controlling symptoms; however other items that were important for youth had to do with exerting personal control over symptoms for recovery improvement that were not included in the original factor. Fourth, Factor 4 (Social Support and Moving beyond Recovery) for the youth sample corresponded well to Factor 4 of the original five-factor RAS (Reliance on Others); however it also included items that had a personal focus of recovery and moving beyond recovery (i.e., “I am the person most responsible for my recovery” or “It is important to have healthy habits) that were not included in the original five factor structure. Interestingly, the original structure of Factor 4 included the item “it is important to have a variety of friends,” that was not important to youth (i.e., not part of the four-factor structure) of Factor 4. This is noteworthy, since youth in treatment are told to “stay away from old friends that may be negative for recovery.”

As supported by convergence testing, the RAS four-factor model is psychometrically sound, hence may be a valid measure of recovery for substance abusing youth. Specifically, the RAS corresponded well to other standardized measures (BAM, GAIN-SS, SF-12, and DASE) that assess important domain areas related to “recovery” (i.e., measure areas of functioning and improvement) that are embedded under commonly used definitions of recovery including sobriety, personal health/wellbeing, and citizenship.

With regards to the BAM and the RAS, results showed that the four RAS factors were negatively correlated with the BAM substance abuse domain. Participants endorsing the RAS measures would perceive themselves to be on the way to recovery (across the four domains), hence more able to stay away from substance abuse behaviors. Items of the RAS Factor 1 (personal determination) reflect having a desire to succeed and having purpose, which is opposite the BAM risk domain (concerned with problems of physical health, sleep, stress, mood, delusions, violent behavior, and cravings). Hence, as individuals have positive feelings about themselves and their future, the problems with such risk factors should be reduced.

The convergence between DASE self-efficacy total score and Skills for Recovery (Factor 2) and Self-Control in Recovery (Factor 3) is logical since RAS Factors 2 and 3 and DASE self-efficacy total score measure personal aspects associated with controlling substance use behaviors. The uncorrelated DASE self-efficacy total score with Factor 1 and 4 is not surprising since these RAS factors measure broad aspects of how people perceive life in terms of recovery and social support for recovery rather than personal confidence in recovery.

The negative correlations between all of the RAS Factors and the GAIN total disorder scales are expected since participants who are in the process of recovery or working on changing one’s lifestyle should perceive fewer symptoms across the GAIN behavioral health issues (internal mental distress, behavioral complexity, substance use problem severity, and crime/violence).

Results of convergent testing between the RAS four factor structure and the SF-12 suggest that recovery from substance abuse is more about perceived mental health status than physical health since convergent results were only significant between the RAS and the mental health MCS with only RAS Factor 1 significantly diverging from the PCS measure.

Limitations

Caution should be taken when inferring the psychometric properties of the RAS given the exploratory nature of the study. Since youth self-selected to participate in the aftercare study, the generalizability to other young people is limited. The small sample size also limits the results such that a larger sample would allow for confirmatory factor analysis and also for more sophisticated analyses (e.g., IRT's rating scale model). Additionally, the RAS data are based on self-report, which may be subject to over- or under-reporting. However, because the instrument was self-administered and filled out in private settings, the impact of self-report bias is reduced.

Conclusions

Systematic attempts to understand and measure recovery among youth are lacking. Results from this study may be useful for the mental and behavioral health field as they support the current definitions of recovery being a personal-driven process, focused on lifestyle improvement (Best et al. 2012). Findings suggest that caution should be taken by treatment and recovery-based aftercare programs alike when discussing recovery-goal directed outcomes with youth (i.e., use of traditional-based recovery outcome rhetoric of abstinence and relapse vs. emphasizing recovery as a behavioral process). Further research, with larger samples, may investigate other psychometric properties of the measure, such as establishing cut-points and criterion-related validity.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

This study was supported by grant K01 DA027754 from the National Institute on Drug Abuse (NIDA). The authors acknowledge the contributions of the research team, including faculty mentors, students (Kara Lee and Christina Zavalza), as well as, collaborating treatment agencies.

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Figure 1. Parallel analysis scree plot. This plot shows the results of the parallel analysis in which the line with the diamonds represents the original eigenvalues, the boxed line shows the mean eigenvalues of the resampling, and the triangle line represents the estimated eigenvalues at the 95th percentile.

Table 1

Results from EFA of the RAS among substance abusing youth in recovery

Factor 1: Personal Determination ($\alpha = .855$)	EFA ^J
01: I have a desire to succeed	.656
03: I have goals in life that I want to reach	.607
04: I believe I can meet my current personal goals	.594
05: I have a purpose in life	.623
15: I like myself	.541
16: If people really knew me they would like me	.357
17: I am a better person than before my experience with alcohol/drug use	.522
20: I have an idea of who I want to become	.553
21: Things happen for a reason	.626
22: Something good will eventually happen	.395
24: I'm hopeful about my future	.658
25: I continue to have new interests	.594
Factor 2: Skills for Recovery ($\alpha = .802$)	
09: I can identify what triggers my alcohol/drug use	.617
12: I know that there are alcohol/drug use services that do help me	.697
31: I am willing to ask for help	.323
32: I ask for help, when I need it	.607
34: I know what helps me get better	.699
35: I can learn from my mistakes	.437
38: I can identify the early warning signs of becoming sick	.624
Factor 3: Self Control in Recovery ($\alpha = .833$)	
02: I have my own plan for how to stay or become well	.426
07: I understand how to control my alcohol/drug use	.797
08: I can handle it if I get sick again	.821
10: I can help myself become better	.591
11: Fear doesn't stop me from living the way I want to	.511
14: I can handle what happens in my life	.509
18: Although my symptoms may get worse, I know I can handle it	.549
28: My symptoms interfere less and less with my life	.360
29: My symptoms seem to be a problem for shorter periods of time each time they occur	.374
36: I can handle stress	.373
Factor 4: Social Support and Moving Beyond Recovery ($\alpha = .773$)	
06: Even when I don't care about myself, other people do	.522
19: If I keep trying, I will continue to get better	.401
23: I am the person most responsible for my own improvement	.489
26: It is important to have fun	.498

37: I have people I can count on	.700
39: Even when I don't believe in myself, other people do	.709
41: It is important to have healthy habits	.391

Note. EFA = exploratory factor analysis; RAS = Recovery Assessment Scale.

¹Values in this column represent the factor loadings of each item generated by the EFA

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Table 2

Factor Structure of the RAS among Substance abusing youth compared vs. mental health sample

4-Factor RAS Substance Abuse Youth Sample (N = 80)	5-Factor RAS Mental Health Sample (N = 1,750)
Factor 1: Personal Determination ($\alpha = 0.86$)	Factor 1: Personal confidence and hope ($\alpha = 0.87$)
1. I have a desire to succeed	11. Fear doesn't stop me from living the way I want to.
3. I have goals I want to reach.	14. I can handle what happens in my life.
4. I believe I can meet my current personal goals	15. I like myself.
5. I have a purpose in life	16. If people really knew me, they would like me.
15. I like myself	20. I have an idea of who I want to become.
16. If people really knew me they would like me	22. Something good will eventually happen.
17. I am a better person than before my experience with alcohol/drug use	24. I am hopeful about my future.
20. I have an idea of who I want to become	25. I continue to have new interests
21. Things happen for a reason	36. I can handle stress
22. Something good will eventually happen	Factor 3: Goal and success orientation ($\alpha = 0.82$)
24. I'm hopeful about my future	1. I have a desire to succeed.
25. I continue to have new interests	2. I have my own plan for how to stay or become well.
	3. I have goals in life that I want to reach.
	4. I believe I can meet my current personal goals.
	5. I have a purpose in life.
Factor 2: Skills for recovery ($\alpha = 0.80$)	Factor 2: Willingness to ask for help ($\alpha = 0.84$)
9. I can identify what triggers my alcohol/drug use	30. I know when to ask for help
12. I know that there are alcohol/drug use services that do help me	31. I am willing to ask for help
31. I am willing to ask for help	32. I ask for help when I need it
32. I ask for help, when I need it	
34. I know what helps me get better	
35. I can learn from my mistakes	
38. I can identify the early warning signs of becoming sick	
Factor 3: Self-control in recovery ($\alpha = .833$)	Factor 5: No domination by symptoms ($\alpha = 0.74$)
2. I have my own plan for how to stay or become well	27. Coping with mental illness is no longer the main focus of my life
7. I understand how to control my alcohol/drug use	28. My symptoms interfere less and less with my life
8. I can handle it if I get sick again	29. My symptoms seem to be a problem for shorter periods of time each time they occur
10. I can help myself become better	
11. Fear doesn't stop me from living the way I want to	
14. I can handle what happens in my life	
18. Although my symptoms may get worse, I know I can handle it	
28. My symptoms interfere less and less with my life	
29. My symptoms seem to be a problem for shorter periods of time each time they occur	

4-Factor RAS Substance Abuse Youth Sample (N = 80)	5-Factor RAS Mental Health Sample (N = 1,750)
36. I can handle stress	
Factor 4: Social Support and Moving Beyond Recovery ($\alpha = 0.77$)	Factor 4: Reliance on others ($\alpha = 0.74$)
6. Even when I don't care about myself, other people do	6. Even when I don't care about myself, other people do
19. If I keep trying, I will continue to get better	37. I have people I can count on
23. I am the person most responsible for my own improvement	39. Even when I don't believe in myself, other people do
26. It is important to have fun	40. It is important to have a variety of friends
37. I have people I can count on	
39. Even when I don't believe in myself, other people do	
41. It is important to have healthy habits	

Table 3

Convergent Analyses between Measures using Robust Fit and Estimates

Relationship		Robust estimate	P	Validity
RAS Factor 1 &	BAM substance use factor	−0.025	*0.053	Divergent
RAS Factor 2 &	BAM substance use factor	−0.039	*0.014	Divergent
RAS Factor 3 &	BAM substance use factor	−0.044	**0.009	Divergent
RAS Factor 4 &	BAM substance use factor	−0.025	*0.054	Divergent
RAS Factor 1 &	BAM risk factor	−0.019	**0.00048	Divergent
RAS Factor 2 &	BAM risk factor	−0.014	0.064	Divergent
RAS Factor 3 &	BAM risk factor	−0.013	0.081	Divergent
RAS Factor 4 &	BAM risk factor	−0.009	0.192	Divergent
RAS Factor 1 &	DASE Total Score	0.014	0.118	Divergent
RAS Factor 2 &	DASE Total Score	0.022	**0.008	Convergent
RAS Factor 3 &	DASE Total Score	0.025	*0.035	Convergent
RAS Factor 4 &	DASE Total Score	0.004	0.351	Divergent
RAS Factor 1 &	GAIN-SS total severity (month)	−0.04	*0.018	Divergent
RAS Factor 2 &	GAIN-SS total severity (month)	−0.039	*0.017	Divergent
RAS Factor 3 &	GAIN-SS total severity (month)	−0.071	**0.00025	Divergent
RAS Factor 4 &	GAIN-SS total severity (month)	−0.021	0.372	Divergent
RAS Factor 1 &	GAIN-SS total severity (lifetime)	−0.011	0.496	Divergent
RAS Factor 2 &	GAIN-SS total severity (lifetime)	−0.035	*0.045	Divergent
RAS Factor 3 &	GAIN-SS total severity (lifetime)	−0.057	**0.00913	Divergent
RAS Factor 4 &	GAIN-SS total severity (lifetime)	0.014	0.361	Divergent
RAS Factor 1 &	PCS-SF-12	0.017	*0.035	Convergent
RAS Factor 2 &	PCS-SF-12	0.004	0.61	Divergent
RAS Factor 3 &	PCS-SF-12	0.012	0.392	Divergent
RAS Factor 4 &	PCS-SF-12	−0.002	0.86	Divergent
RAS Factor 1 &	MCS-SF-12	−0.025	**0.00068	Divergent
RAS Factor 2 &	MCS-SF-12	−0.016	*0.01054	Divergent
RAS Factor 3 &	MCS-SF-12	−0.024	**0.00496	Divergent
RAS Factor 4 &	MCS-SF-12	−0.013	0.163	Divergent

* Significant at 0.05 alpha level.

** Significant at 0.01 alpha level.