## Journal of Addiction and Recovery

# Beyond Recovery Capital: Novel Survey Battery to Assess Psychological Domain Changes During Residential Treatment

Holliday ED[1,2]*; Weingast L[1,3]; Chaney V[1,3]; McDaniel J[1]; Hebert J[1]; Johnston TW[1]; Brown A[1]

[1]Center for Young Adult Addiction and Recovery, Kennesaw State University.

[2]Department of Psychological Sciences, Kennesaw State University.

[3]Department of Social Work, Wellstar College of Health and Human Services, Kennesaw State University.

[4]Department of Applied Statistics, Kennesaw State University.

**\*Corresponding Author(s): Erica Holliday**

Department of Psychological Science, 402 Bartow Ave NW, Kennesaw, Georgia, 30144.

Email: ehollid1@kennesaw.edu

**Keywords:** Recovery, Measurement; Substance Use Disorder; Residential Services.

## Abstract

**Objective**: There is a wealth of research on addiction and its related metrics, however, recovery research and strength-based assessments of progress lag behind. Measurement tools for SUD recovery exist but further understanding of longitudinal changes in psychosocial domains can improve individualized treatment plans. The purpose of the current study was to examine changes in recovery as clients progressed throughout treatment and identify key recovery focus areas at various time points.

**Methods**: The current study deployed an online assessment of variables associated with recovery from SUD for individuals and their families. Critical components of the recovery process throughout SUD treatment were assessed using a novel battery of well-validated metrics. Treatment consisted of stepped, long-term care at a for-profit residential facility in Austin, Texas. Time points were linked to specific benchmarks including intake, residential, extension, IOP, transitional living, and "advocacy" recovery coaching phase. Participants were 28 ($M_{age}$ = 29.54, *SD* = 10.65) residential treatment-seeking individuals. Surveys were deployed at regular intervals throughout the treatment process. Longitudinal measures examined the entire treatment process from entry, to exit, to follow-up. Each component was linked to specific benchmarks.

**Results**: Results indicated that recovery capital increased significantly with a large effect size (p<0.001) demonstrating that services supported recovery. More specifically, Hope and Coping in Recovery increased significantly with a large effect size ($F_{2,81}$=7.237, p=0.001, $\eta^2$= 0.152), but only the hope subscale increased while coping remained stable; General Self-Efficacy increased significantly with a large effect size ($F_{2,81}$= 7.445, p=0.001, $\eta^2$= 0.155). Several other

metrics that were employed changed significantly over the course of treatment and recovery with medium effect sizes ($\eta^2$=0.06-0.124), including resiliency and recovery capital. Results suggest that several domains that are relevant to recovery can be effectively operationalized before, during, and after treatment and recovery from SUD. The findings from this study highlight intrapersonal domains increase significantly during residential treatment while interpersonal domains remained stable, suggesting residential care during early stages of recovery should emphasize self-focused gains.

### Introduction

There is a wealth of research on substance use disorders (SUDs) and metrics related to addiction processes, however, research on recovery progress and strength-based approaches lags behind. There are not many standard practices or intake measures of recovery, despite the various constructs which have been identified as critical in recovery such as hope and coping [1]. Instead, recovery is often understood in a reductive binary as abstinence or non-abstinence, success or not success. Exploring changes in psychosocial measures relevant throughout the recovery process, clinicians and researchers concerned with those with SUDs can design better treatment modalities, more responsive treatment systems, and to develop more rigorous standards of care.

According to the Centers for Disease Control and Prevention, as of June 2020 13% of Americans reported starting or increasing substance to cope with COVID-19 related stress or emotions such as 'confronting a pandemic' and 'isolation at home' [2,3]. The early months of the pandemic also showed an 18 % increase in nationwide overdoses, which continued to 2020 [4]. The COVID-19 pandemic coincided with a significant increase in drug overdose deaths and increases in alcohol and cannabis consumption, and highlights a need to refine measurements of recovery progress to improve individual and community recovery services. In the present study we deployed a battery of tests designed derived from qualitative assessments of recovery to longitudinally quantify domains of recovery during residential treatment stays. Thus, our test battery included measures of resiliency, self-esteem, motivation, emotional competence, and social relations. Utilizing a recovery-informed lens [5] and improving our understanding of the ways in which people change during treatment, practitioners can improve SUD treatments and post-treatment outcomes for clients during this critical time in history.

Resilience is often thought of as overcoming adverse life events, where SUD and relapse are considered the adversity, and resiliency is a personal characteristic that is developed and maintained throughout SUD recovery [6]. Substance usage is often discussed as a maladaptive coping strategy in the face of adversity. This perspective on resilience during recovery takes the stance that recovery consists of resisting against the adversity of negative consequences from disordered substance use patterns. However, this perspective implies that SUD is a matter of willpower. It does not factor in the neurobiological basis of resilience through SUD recovery and the disease model of SUD. The Brief Resilience Scale (BRS) is the only measure that specifically assesses resilience as the capacity to recovery from stressful or adverse life events [7]. The BRS is negatively associated with anxiety, depression, negative affect, and physical symp-

toms when other resilience measures and optimism, social support, negative affect, and social inhibition were controlled [7]. The BRS is positively related to personal characteristics, social relations, coping, and health. There may be other viewpoints that discuss resilience as less of a black-and-white construct in the context of SUD recovery, and rather something that is more than just using a substance or not using a substance. Future research should explore how resilience factors, such as social relationships or coping, can influence the nonlinear path of the recovery process.

Self-efficacy and self-esteem are associated interpersonal domains that describe how an individual perceives their capability and worth, respectively, and can be mediated by resilience. The General Self-Efficacy Scale (GSE) captures differences among individuals in their tendency to view themselves as capable of meeting task demands in a broad array of contexts [8]. This construct is important to include in a battery of recovery measures because could reflect how one expects to cope with challenges that arise along the way during the recovery process. The Rosenberg Self-Esteem Scale captures how one If one has low self-efficacy or self-esteem, one may view themselves as less capable of meeting the demands of a rehabilitation program, which could then in turn affect treatment engagement. Future research is needed on the interplay between characteristics like self-esteem and treatment motivation, engagement, and time to stable and sustainable SUD recovery.

Motivation has a significant impact on initiating and sustaining recovery [9]. This measure is vital to include in a battery assessing recovery and potential recovery pathways. The cognitive preparedness of an individual to start the recovery process is just as crucial as the actual engagement in treatment. The TEQ assesses self-determined motivation for SUD treatment, but it is unclear if motivation changes during the course of residential treatment. Intrinsic motivation and accepting treatment as the best way forward for recovery impacts outcomes, thus including measures such as the TEQ into batteries given out at rehabilitation programs may lend insight into the projected recovery path of a client [9]. In turn, adapting treatments to encourage more autonomy and confidence for individuals with lower intrinsic motivation could also improve recovery outcomes.

Emotional dysregulation and deficits in emotional intelligence associate with substance use and severity across multiple classes of illicit drugs. Measuring emotional competence throughout treatment can provide insight into the importance of addressing emotional regulation during residential SUD treatment. The Short Profile of Emotional Competence (PEC) measures one's own emotions, identification of others' emotions; understanding of own emotions, understanding of others' emotions; expression of own emotions, listening to others' emotions; regulation of own emotions, regulation of others' emotions; use of own emotions, and use of others' emotions. Additionally, social support is important to long-term recovery and can be impacted by emotional intelligence. Thus, we also included the multidimensial perceived social support scale (MPSS) to capture changes in social connectedness as part of the recovery journey. We included both measures to gather information on individual emotional and social needs that can aid in future development of personalized recovery plans as well as generalizable applications during recovery processes.

The purpose of the current study was to identify critical components of the recovery process during residential care to refine services offered and received in SUD treatment. The current

study deployed an online assessment of multiple well-validated metrics associated with recovery from SUDs for individuals receiving long-term residential stepped care. The metrics chosen capture constructs important to recovery processes including hoping and coping, resiliency, self-esteem, self-efficacy, and motivation for treatment. The battery of metrics selected for this study capture several constructs identified as important to recovery at single time points but there is limited data on how these constructs change over time while resolving an SUD.

### Methods

#### Participants

Samples were drawn from incoming treatment clients at an SUD treatment facility in Austin, Texas. Periodic online assessments were given via Qualtrics. Assessments were grouped by treatment stage, determined by key clinical focus areas. This approach allowed for cross sectional, longitudinal, and predictive analysis to occur. Each participant was directed to the online portal to read the informed consent and either accepted or declined to participate. This was an anonymous study. At the beginning of the survey, participants read a consent form and were asked to confirm their consent for participation. Individuals who did not consent were taken to the end of the survey with no consequences to the client's treatment plan. Informed consent was gathered from staff at the treatment facility who was overseeing the survey administration as well.

#### Intervention

Participants underwent stepped care long-term residential treatment for SUDs. Stepped care is a system of delivering and monitoring mental health treatment so that the most effective, yet least resource intensive treatment, is delivered first. More intensive and more specialist services are delivered as required and depending on the level of patient distress or need. Thus, stepped care interventions offer a variety of treatment options to match the intensity of the patient's presenting problem as well as potential patient preference [10,11]. Mental Health professionals including PhDs, MDs, LPCs, LCSWs, LMFTs delivered treatment for SUDs in a residential treatment facility. The program's therapies include: Individual counseling, Group therapy, Family therapy, Psycho-educational groups, 12-Step meetings, Equine Therapy, Fitness and Nutritional counseling, Meditation, yoga and massage, Eye Movement Desensitization and Reprocessing (EMDR), Life coaching, Psychiatric care, Relapse prevention planning, and aftercare and alumni groups.

#### Data Collection

Surveys were deployed at regular intervals throughout the treatment process. Two parallel data streams were utilized. Longitudinal measures examined the entire treatment process from entry, to exit, to follow-up. Each component was linked to specific benchmarks including intake, residential, extension, IOP, transitional living, and "advocacy" recovery coaching phase. The second stream of data consisted of data capture as per usual operations including demographics, diagnostics, and case notes etcetera. Incoming longitudinal data was considered pre-test, longitudinal outcomes was considered post-test, and was taken at a pre-determined point after treatment. Data collection and survey use was approved by a university Institutional Review Board and transferred to researchers for analysis using a secure data transfer software.

Metrics included the Hope and Coping in Recovery Measure [7], the Brief Resilience Scale [7], the Rosenberg Self-Esteem Scale [12], the General Self-Efficacy Scale [13], Multidimensional Scale of Perceived Social Support [14], Brief Assessment of Recovery Capital [15], Treatment Entry Questionnaire [16] Short Profile of Emotional Competence [17], and other Relationship Health Outcomes which were additional questions developed for the study.

#### Hope and Coping in Recovery (HCRM)

The Hope and Coping in Recovery Measure (HCRM) consists of 12 items with 5 questions regarding hope and 7 questions regarding coping. HCRM is a measure of the presence of hope and healthy coping mechanisms in individuals in recovery that shows good validity and internal consistency (0.912) for the overall instrument and for both the Hope and Coping subscales (.874) [1]. The alpha coefficient was 0.97 with a 2-week test–retest reliability of 0.91[1].

#### Brief Resilience Scale

The Brief Resilience Scale (BRS) assesses an individual's ability to recovery from stressful live events [7] and consists of 6 items, 3 of which are positively worded and 3 of which are negatively worded. The following instructions are used to administer the scale: "Please indicate the extent to which you agree with each of the following statements by using the following scale: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 =agree, 5 = strongly agree." [7]. The BRS shows good internal consistency, with Cronbach's alpha ranging from .80–.9. BRS has demonstrated good test-retest reliability (ICC of.69) [7].

#### Rosenberg Self-Esteem Scale

The Rosenberg Self-Esteem Scale [18] is a 10-item global self-report measure of an individual's self-appraisal of his or herself as a social individual. Test takers respond to each item using a four-point Likert-type response scale ("strongly agree," "agree," "disagree," or "strongly disagree. Scores range from 0-30 with higher scores indicative of greater, but not excessive, levels of self-esteem. Reliability estimates are high (alpha = .96), and responses to individual RSES items were highly consistent indicating good reliability of scores [12]. Finally, convergent and discriminant validity evidence was that associations generally fit with the theoretically and empirically expected pattern.

#### General Self-Efficacy Scale

The General Self-Efficacy Scale (GSES) consists of 10 items (scored 1-4) and it has undergone multicultural validation studies. GSE is an individual's view of their own ability to perform well or gain achievements in a variety of situations [8].

#### Other Relationship Health Outcomes

These items were additional questions that researchers added to the battery for context about relationships. This was important to add given the robust research showing the role of social support in recovery from SUDs, as well as changing relationships as the individual distances themselves from social ties that may have connected them to substances.

#### Multidimensional Scale of Perceived Social Support

The Multidimensional Scale of Perceived Social Support [14] is a 12-item measure of perceived adequacy of social support from three sources: family, friends, & significant other; using a 5-point Likert scale (0 = strongly disagree, 5 = strongly agree).

Cronbach's alpha was .84-.92 for the whole measure and the validity of the MDS subscales have also been confirmed.

### Brief Assessment of Recovery Capital

The BARC is a 10-item measure that has high content validity capturing 10 domains of recovery capital [15]. It provides an index of recovery progress that extends beyond mere abstinence. As such, it might be used as measure of the positive outcome benefits accrued as individuals abstain or reduce their substance use.

### Treatment entry questionnaire

The TEQ assesses self-determined motivation for addiction treatment. Items are rated on a Likert scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). The scale is designed such that four items assess each of the identified, introjected, and external motivation. The TEQ exhibits very good internal consistency in both the residential (internal motivation $\alpha$ = .90, introjected motivation $\alpha$ = .83, and external motivation $\alpha$ = .87) and outpatient samples (internal motivation $\alpha$ = .95, introjected motivation $\alpha$ = .87, and external motivation $\alpha$ = .87).

### Short Profile of Emotional Competence

The short PEC is a 20-item tool that measures 10 dimensions (identification of own emotions, identification of others' emotions; understanding of own emotions, understanding of others' emotions; expression of own emotions, listening to others' emotions; regulation of own emotions, regulation of others' emotions; use of own emotions, use of others' emotions) [17]. The reliability of the intrapersonal EC score is .86, of the interpersonal EC score is .89 and of the total EC score is .92. Examples of items are ''during an argument, I can't identify if I am sad or angry (Reversed)'' and ''my emotions inform me of what is important to me''. The validity of EC is demonstrated through its significant positive relationship with positive affect and significant negative relationship with negative affect [17].

### Analysis

All descriptive statistics were calculated in SPSS version 27 using the descriptive statistics tool. Error bar charts were created in Excel using the means and standard errors of the means calculated in SPSS version 27. The correlation matrix for the metrics at intake was created in SPSS using a two-tailed Pearson bivariate correlation analysis.

To analyze the significance between the means, a One-Way ANOVA was performed in SPSS using the Bonferroni and LSD post-Hoc tests. To determine if the difference of means from intake to first follow up is significantly different than the difference between the first follow up and second follow up, the delta values were calculated and compared using t-tests assuming unequal variances in Excel.

### Results

### Participants

255 consented to participate in the study. 1 participant completed the study to the fourth follow-up time point, 10 participants completed the study to the third follow-up time point, 28 participants completed the study to the second follow-up time point, and 114 participants completed the study to the first follow-up time point. Participants were 54.12% male (n=138), 43.53% female (n=111), 0.78% transgender (n=2), and 1.18% other (n=3) **(See Figure 1A)**. The sample was 85.49% white

(n=218), and the next two most frequent ethnicities were Latin/Hispanic/LatinX which made up 5.88% of the sample (n=15) and African American or Black which made up 3.14% of the sample (n=8) **(See Figure 1B)**. A majority (64.7%) of the sample was between 20-39 years old (n=165).

### Treatment Changes Overview

There was a significant difference between the means for intake and the first follow up for most measures. There are less significant differences between the means from the first follow up to the second follow up. See **Figure 1C** and **1D** for differences in recovery status at intake and first follow up. Most participants (64.49%) at intake identified as being at the beginning of their recovery process (less than one month in recovery). At the first follow up, most participants (53.98%) identified as being very early in their recovery process (between one and three months in recovery). At the second follow up, most participants (57.14%) identified as being in recovery for some time (between three and six months in recovery).

Recovery Capital significantly increased over time ($F_{2,81}$=5.3, p=0.007, $\eta^2$=0.116) indicating services provided by clinic staff supported recovery efforts. Results indicated that Hope and Coping in Recovery increased significantly with a large effect size ($F_{2,81}$=7.237, p=0.001, $\eta^2$= 0.152); interestingly, the subdomain of Hope showed increases from intake to first follow-up (t(27) = 9.67, p <0.001) and from intake to second-follow up (t(27) = 9.73, p <0.001) ( while the coping subdomain did not show differences. General Self-Efficacy increased significantly with a large effect size ($F_{2,81}$= 7.445, p=0.001, $\eta^2$= 0.155) with similar increases from intake to first follow-up (t(27) = 4.87, p <0.001) and intake to second follow up (t(27) = 5.79, p <0.001).

Several other metrics that were employed changed significantly over the course of treatment and recovery with medium effect sizes ($\eta^2$=0.06-0.124), including resiliency and self-esteem. Specifically, resilience increased significantly over time with a medium effect size ($F_{2,81}$=5.743, p=0.005, $\eta^2$=0.124) with the most gains from intake to first follow-up (t(27) = 6.14, p <0.001). Self-Esteem increased significantly over time with a medium effect size ($F_{2,81}$=5.222, p=0.007, $\eta^2$=0.114) with a significant increase from intake to first follow-up (t(27) = 4.84, p <0.001). There were no significant changes in perceived social support, overall motivation for treatment, or emotional competency. Further, there were no significant correlations with motivation for treatment with any other constructs measured at intake suggesting motivation for treatment and increases in recovery capital are separate processes. Together these findings demonstrate a need target services to promote hoping, resiliency, efficacy early in receiving residential treatment to support long-term, stable recovery. For more information on changes over time during treatment, and for more specific timelines of improvement see **Figure 2**.

### Discussion

There is a dearth of systematic studies examining recovery processes or pathways and a lack of consensus on how to operationalize recovery. The current study addressed the gap in measuring recovery at intakes and throughout treatment at residential inpatient center for SUD. The measures used in the current study provide a vantage point from which to further examine recovery processes. These metrics measure psychological constructs that have the potential to influence recovery trajectories and have the common thread of capturing qualities that can be
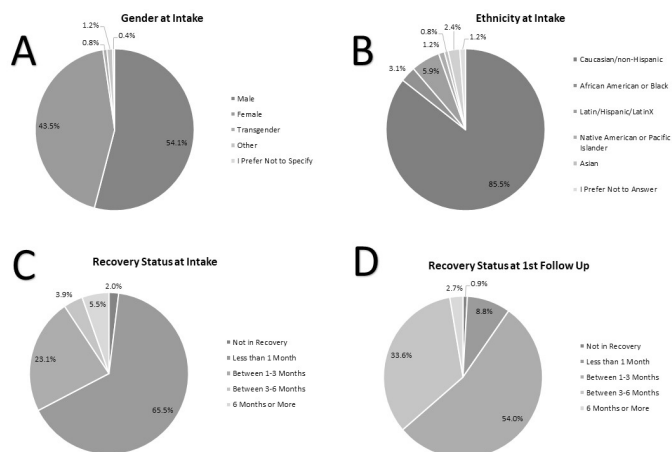
**Figure 1:** Demographics of participants in a for-profit residential recovery center. At the time of intake, participants (N=255) were mostly Caucasian men and had reported being in recovery for less than one month. During the second-follow up (N = 114) more participants reported being in recovery for 1-6 months which correspond to self-reported increases in recovery capital.



**Residential Recovery Metrics**

harnessed throughout treatment to encourage recovery initiation and improve recovery sustainability. They share themes of social connectedness and support, optimism and expectations of oneself, motivation, and facing stress or challenges.

The battery employed here captures constructs underlying recovery including hope and coping, resiliency, self-efficacy and self-esteem. Overall, individuals tracked from intake to first and second follow-ups report increases in recovery capital, measured by the BARC-10, confirming services received support recovery wholistically. We report significant increases in hope, resiliency, efficacy, and self-esteem with the largest gains from intake to first follow-up and plateauing through remainder of residential care. On the other hand, there were no increases in motivation to enter treatment, perceived social support, or emotionally competency. Together with our finding that hope, but not coping, increase during care suggests that individuals receiving residential treatment for SUD may be focused on self-focused recovery processes before addressing social influences on recovery.

The current study provides a building block for improving intake metrics for SUDs and recovery. In order to the determine appropriate level of services and individualize treatment for those in recovery from SUD, the field should move towards developing a well-validated and reliable recovery battery. Improving management and aftercare of individuals after treatment for SUD may also improve post-treatment outcomes of recovery so that it is more sustainable in the long-term. Although care should be taken when generalizing results in this report as subject loss and attrition occurred due to individuals leaving the residential care facility. Further, given the limitations of sampling from a for-profit residential treatment center where subjects leave against medical care and/or due to loss of financial support, future study design should deploy follow up assessments at shorter time intervals to verify and replicate our assertion that early recovery gains should be focused on intrapersonal domains. Additionally, future research incorporating neuropsychological and physiological data into recovery metrics would provide multi-modal, reliable information on recovery's trajectory, and may contribute to de-stigmatization.
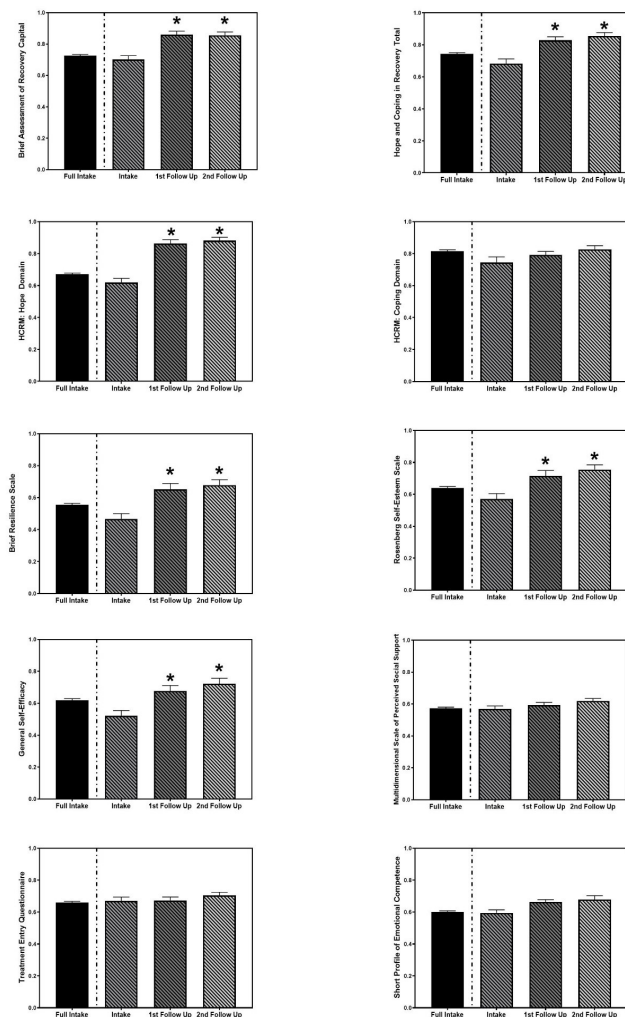
**Figure 2:** Survey results to operationalize psychological domains of recovery during residential treatment. Recovery services provided in a residential treatment facility should focus on improving intrapersonal domains during early recovery. Black bars off-set by the dotted line represent survey results from all participants (N=255) during initial intake. Domains with significant increases in this subgroup include recovery capital, hope, resilience, self-esteem, and self-efficacy. Unaffected domains include emotional competence, perceived social support, and motivation for treatment. The bars to the right of the dotted line depict results from a subgroup of participants that received residential treatment and provided survey results during intake, first follow-up, and second follow-up (n=27). The subgroup that received the longest duration of treatment have lower scores vs. the full intake indicating a need for more residential recovery services. * < p 0.05 compared to subgroup intake in post-hoc tests.

## References

1. Shumway ST, Dakin JB, Smock Jordan SA, Kimball TG, Harris KS, et al. The development of the hope and coping in recovery measure (HCRM). Journal of Groups in Addiction & Recovery. 2014; 9: 280-293.

2. Czeisler MÉ, Lane RI, Petrosky E, et al. Mental Health, Substance Use, and Suicidal Ideation During the COVID-19 Pandemic-United States, June 2020. MMWR Morb Mortal Wkly Rep. 2020; 69: 1049-1057.

3. Du J, Fan N, Zhao M, Hao W, Liu T, et al. Expert consensus on the prevention and treatment of substance use and addictive behaviour-related disorders during the COVID-19 pandemic. General psychiatry. 2020; 33: e100252.

4. Abramson A. Substance use during the pandemic. Monitor on Psychology. 2021 ; 52.

5. McDaniel JM, Brown AM, Heller AT, Johnston TW, Bergman B, et al. Interdisciplinary Expansions: Applying Recovery-Informed Theory to Interdisciplinary Areas of Recovery Science Research. Alcoholism Treatment Quarterly. 2020; 38: 457-469.

6. Rudzinski K, McDonough P, Gartner R. Strike. C. Is there room for resilience? A scoping review and critique of substance use literature and its utilization of the concept of resilience. Substance Abuse Treatment, Prevention, and Policy. 2017; 12.

7. Smith BW, Dalen J, Wiggins K, Tooley E, Christopher P, et al. The brief resilience scale: assessing the ability to bounce back. International journal of behavioral medicine. 2008; 15: 194-200.

8. Judge TA, Erez A, Bono JE. The power of being positive: The relation between positive self-concept and job performance. Human performance. 1998; 11: 167-187.

9. Groshkova T. Motivation in substance misuse treatment, Addiction Research & Theory. 2010; 18: 494-510.

10. O'Donohue WT, Draper C. The case for evidence-based stepped care as part of a reformed delivery system. In Stepped care and e-health (pp. 1-16). Springer, New York, NY. 2011.

11. Von Korff M, Tiemens B. Individualized stepped care of chronic illness. Western Journal of Medicine. 2000; 172: 133.

12. Ruddell RJ. Validity and reliability evidence for the Rosenberg self-esteem scale with adults in Canada and the United States (Doctoral dissertation, University of British Columbia). 2020.

13. Schwarzer R, Jerusalem M. Generalized Self-Efficacy scale. In J. Weinman, S. Wright & M. Johnston. Measures in health psychology: A user's portfolio. Causal and control beliefs. Windsor, UK: NFER-NELSON. 1995; 35-37.

14. Zimet GD, Dahlem NW, Zimet SG, Farley GK. The multidimensional scale of perceived social support. Journal of personality assessment. 1998; 52: 30-41.

15. Vilsaint CL, Kelly JF, Bergman BG, Groshkova T, Best D, et al. Development and validation of a Brief Assessment of Recovery Capital (BARC-10) for alcohol and drug use disorder. Drug and Alcohol Dependence. 2017; 177: 71-76.

16. Urbanoski KA, Wild TC. Assessing self-determined motivation for addiction treatment: Validity of the Treatment Entry Questionnaire. Journal of Substance Abuse Treatment. 2012; 43: 70-79.

17. Mikolajczak M, Brasseur S, Fantini-Hauwel C. Measuring intrapersonal and interpersonal EQ: The short profile of emotional competence (S-PEC). Personality and individual differences. 2014; 65: 42-46.

18. Rosenberg M, Schooler C, Schoenbach, C. Self-esteem and adolescent problems: Modeling reciprocal effects. American sociological review. 1989; 1004-1018.