Development and Psychometric Properties of the Multidimensional Inventory of Recovery Capital (MIRC)

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Abstract

Background: Researchers have developed several instruments to measure recovery capital—the social, physical, human, and cultural resources that help people resolve alcohol and other drug problems. However, existing measures are hampered by theoretical and psychometric weaknesses. The current study reports on process and psychometric outcomes for the Multidimensional Inventory of Recovery Capital (MIRC), a novel measure of recovery capital.

Methods: We used a three-phase, mixed methods approach to develop the MIRC. Individuals who identified as having resolved alcohol problems were recruited in each phase. Phase one focused on item development, with participants providing qualitative feedback on potential items. In phase two (pilot testing) and phase three (final psychometric evaluation), participants completed revised versions of the MIRC to assess its psychometric strength and item performance.

Results: Phase one (n=44) resulted in significant item alteration, culminating in a 48-item pilot measure. Pilot testing analyses (n=497) resulted in the deletion or replacement of 17 items. In the final psychometric evaluation (n=482), four additional items were deleted, resulting in a 28-item MIRC comprising four subscales measuring social, physical, human, and cultural capital. The psychometric properties of the final MIRC and its subscales ranged from sound to strong, with high response variability suggesting appropriate item discrimination.

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Conclusion: Results confirm the psychometric strength of the MIRC and underscore the importance of incorporating the insights of diverse samples of people in recovery. The MIRC holds promise as an assessment tool in future research and is available for use at no cost in treatment and community-based settings.

Keywords

alcohol; measure; psychometric; recovery; recovery capital

1. Introduction

There is a growing consensus among stakeholders that resolving alcohol and other substance use disorders, or recovering, is a complex and dynamic process of change extending beyond abstinence (Kaskutas et al., 2014; Laudet, 2007; Witkiewitz et al., 2020). Recognizing this, the National Institute on Alcohol Abuse and Alcoholism (NIAAA) defines recovery as a process and an outcome marked by the remission of Alcohol Use Disorder (AUD) criteria as specified in the DSM-5, cessation of heavy drinking, and improvements in well-being (Hagman et al., 2022). Relatedly, the concept of recovery capital (Cloud & Granfield, 2001; Granfield & Cloud, 1999) has broadened notions of recovery by aiming to capture the full spectrum of recovery determinants within a resource-based ecological framework.

The concept of recovery capital was initially developed among a sample of individuals who resolved their substance use problems without treatment, known as natural recovery (Cloud & Granfield, 2001). Although the original theory centered on social capital within this context (i.e., social networks and resources that promote recovery), Cloud and Granfield (2008) later expanded recovery capital to include physical, human, and cultural capital. Physical capital encapsulates the tangible resources that impact recovery, such as finances, transportation, and housing. Human capital includes internal resources involved in recovery, such as mental and physical health, having a hopeful outlook, and motivation. Finally, cultural capital includes cultural and community determinants of recovery, such as cultural traditions that are conducive to recovery and access to community-level resources. The theoretical expansion also introduced negative capital, referring to factors within each of the four domains that deter recovery (Cloud & Granfield, 2008).

Recovery capital has been researched among many populations, including adolescents, people in rural communities, formerly incarcerated individuals, older adults, and people with varying levels of treatment experience (Hennessy et al., 2019; LaBarre et al., 2021; Lyons & Lurigio, 2010; Palombi et al., 2019). Across populations, researchers have theorized that recovery capital can act as a mechanism that reduces psychological distress and promotes sustained recovery (Kelly & Hoeppner, 2015). In sum, recovery capital comprises internal and external resources that interact with the environment across time and domains in dynamic fashion, influencing one's ability to meet recovery goals (Best & Hennessy, 2022).

1.1 Recovery capital measurement

Since the concept debuted in the literature more than two decades ago, interest in recovery capital measurement has increased steadily. We identified six measurement tools

to assess recovery capital. Sterling and colleagues (2008) created a 23-item measure of recovery capital culled from existing assessments. Similarly, Burns and Mark (2013) created a seminal Recovery Capital Questionnaire (RCQ) based on Cloud and Granfield's (2008) conceptualization. Though these two scales provided an essential foundation for measurement, neither has been extensively tested since their initial formation. The Assessment of Recovery Capital (ARC) and its briefer version, the BARC-10, are the most widely utilized contemporary recovery capital measures (Groshokova et al., 2013; Vilsaint et al., 2017). In addition, Hanauer and colleagues (2019) developed a ten-item measure that mirrors the BARC-10's theoretical structure. Finally, the REC-CAP allows patients in recovery to assess their recovery capital access over time (Cano et al., 2017; see http://www.recoveryoutcomes.com/rec-cap/) and is accessed through a paid software system.

Though existing tools have helped assess recovery capital in research and practice, conceptual inconsistencies have constrained research advancement on this multifaceted construct (Best & Hennessy, 2022; Hennessy, 2017). For instance, with exception of the REC-CAP, which assesses recovery barriers, the RCQ, ARC, and BARC-10 do not systematically assess negative recovery capital. Furthermore, the ARC, BARC-10, and the scales developed by Sterling et al. (2008) and Hanauer et al. (2019) contain items that do not reflect recovery capital theory, such as items implying an abstinence-centered view of recovery (Bowen et al., 2020; Cloud & Granfield, 2008). Additionally, although most of the U.S. population that has resolved an alcohol use disorder has done so without formal treatment (Tucker et al., 2020), to our knowledge, all prior measures were primarily or exclusively tested among individuals in clinical and self-help settings. Finally, the ARC and BARC-10 were created without significant community involvement in developing measurement items and evaluated within somewhat homogenous samples. For instance, the BARC-10 was tested with a sample that was 93% White (Vilsaint et al., 2017). In light of these limitations, our research team aimed to develop a robust new measure of recovery capital, termed the Multidimensional Inventory of Recovery Capital (MIRC).

1.2 Current study

The purpose of this paper is to describe the development and psychometric evaluation of the MIRC. We aimed to address the limitations of previously developed measures through the inclusion of physical, human, social, and cultural capital domains, as well as the assessment of negative capital within each domain (Cloud & Granfield, 2008). Furthermore, we sought to create items aligned with recovery capital theory, informed by the insights of a diverse sample of individuals representing multiple recovery pathways (i.e., individuals in natural recovery or using a combination of treatment and self-help resources). The MIRC is intended to assess recovery capital in adults (age 18 and over) at any time point in recovery in a range of community settings (e.g. outpatient treatment; social service programs; self-assessment).

We used a three-phase, mixed methods approach to develop and test the MIRC, as conveyed in Figure 1. In this paper, we summarize the results of each phase, including the development and vetting of measurement items with a sample of service providers and people in recovery (Phase 1); psychometric evaluation of item performance and scale

reliability for the pilot MIRC (Phase 2); and psychometric evaluation of item performance, reliability, and validity for the final MIRC (Phase 3).

2. Methods

2.1 Overview

Participant eligibility across the three phases was based on the following criteria: (1) age 18 or older; (2) living in the United States; (3) able to communicate in English; and (4) identifying as having resolved a prior problem with alcohol (alone or with other drugs) for at least 30 days. Our focus on alcohol recovery was informed by funder priorities as well as recognition of the unique recovery context of alcohol as a legal and widely available and acceptable substance. In addition, service providers in the addiction treatment field were included in the item development phase, as described below. Data collection took place between October 2020 and April 2022 and all study procedures were approved by the University at Buffalo Institutional Review Board.

2.2. Sample characteristics

Table 1 summarizes characteristics of the sample across study phases. The item development sample included people in recovery from alcohol problems (n=35) and nine service providers, who are not included in the table as providers did not complete recovery-related measures. The pilot testing (n=497) and final psychometric evaluation (n=482) samples were diverse with regard to gender, race, ethnicity, and sexual orientation and included 40–45% lower income individuals. The final evaluation sample closely reflected 2020 Census demographics for the U.S. over-18 population, with minor over-representation of individuals identifying only as White (70.8% vs. 64.1% Census) and American Indian (5% vs. 1.1% Census) and under-representation of Asian Americans (2.9% vs. 6.1% Census) and individuals identifying as more than one race (3.9% vs. 8.8% Census).

Participants in early, middle, and long-term recovery were represented across the three samples. Although most participants had experience with treatment and/or mutual aid groups, a substantial minority met the definition for natural recovery, including 23.1% in pilot testing and 31.7% in psychometric evaluation. Mean scores on the Short Inventory of Problems (SIP)-Lifetime version, an indicator of alcohol problem severity (Morse & Roberson, 2017; range 0–15), were 12.5 in item development, 9.4 in pilot testing, and 10.2 in psychometric evaluation. The majority of participants reported no or occasional alcohol use (monthly or less), with 8.6 to 25.4% reporting regular use (weekly or greater) across the three phases.

2.3. Item development (Phase 1)

The purpose of Phase 1 was to vet and refine potential MIRC items through interviews and focus groups with people in recovery and service providers. Item development methods and results are described in depth in Bowen et al. (2022). Briefly, after preparing an initial list of items based on a literature review and consultation with nine recovery research experts, we gathered feedback on the items via seven focus groups with two to four participants each and 13 individual interviews. Data collection took place via Zoom and participants

were compensated with $30 e-gift cards. Two researchers coded participants' feedback using verbatim transcriptions and guided the research team in revising the items based on the coded results. Next, we conducted cognitive interviews (Willson & Miller, 2014) via Zoom with 12 individuals in recovery, who completed a test version of the MIRC with 49 items and described their reaction to the items and their thought process in answering them. Participants received $20 e-gift cards. Following a review of the cognitive interviewing feedback, the research team made further revisions, including dropping one item.

Only nine items from an initial list of 90 potential items were retained in their original form on the 48-item pilot MIRC. Items were organized into five subscales (social, physical, human, cultural, and community capital). Each subscale contained items measuring positive recovery capital (e.g., "my family supports my recovery" under social capital) and negative recovery capital (e.g., "I feel disconnected from my culture or not part of any culture" under cultural capital). Items had four response options: strongly disagree, disagree, agree, and strongly agree. The choice to use four options was based on Simms et al.'s (2019) finding that having a middle response option generates ambiguity and that there are diminishing returns to increasing the number of potential responses. Cognitive interviewing indicated that the question formatting and response options were acceptable to participants and easy to administer.

2.4. Pilot testing (Phase 2)

The aim of Phase 2 was to evaluate item performance, internal consistency, and test-retest reliability for the pilot MIRC in a national sample. We used Amazon's Mechanical Turk (MTurk), a crowdsourcing platform, for recruitment and data collection (n=497). Prior research with people with alcohol problems indicates comparability between MTurk samples and samples recruited through in-person methods (Kim & Hodgins, 2017; Strickland & Stoops, 2018; Strickland et al., 2019). Potential participants completed an eligibility screening within the MTurk portal, which contained decoy questions to mask the study's aims (e.g. "Do you use tobacco products at least once a month?"). Participants who screened as eligible were invited to take the full study survey, which included the MIRC; questions about current and past alcohol and other drug use and treatment history; the SIP-Lifetime version (Morse & Roberson, 2017); and demographic questions. Participants were compensated $4 through MTurk. A subsample of participants (n=53) retook the MIRC approximately one week later and were compensated $2.

2.5. Psychometric evaluation (Phase 3)

Following analysis of pilot testing data (described further in the results), we modified the MIRC and tested the final version in Phase 3. We used Innovate MR, a national market research and digital sampling provider, to recruit the sample (n=482). Innovate MR maintains a diverse online panel of more than 1 million respondents and employs several practices to ensure data quality, including benchmark quality testing, pattern detection, and digital fingerprinting (Lee et al., 2018). Participants completed the same survey as in the pilot testing phase, with the following measures added to calculate concurrent validity: Brief 2-Way Social Support Scale (Obst et al., 2019); Sense of Community subscale of the Perceived Neighborhood Scale (Martinez et al., 2002); and the 26-item version of the

World Health Organization's Quality of Life measure (WHOQOL-BREF; Skevington et al., 2004). A subsample (n=81) retook the MIRC approximately one week later. Participants were compensated through Innovate MR's panel platform by earning points redeemable for gift cards worth $15-$17.

2.6. Quantitative analysis process

We reverse coded all items assessing negative recovery capital, so that higher values denoted higher levels of capital. Next, we summarized item distributions using frequencies and relative frequencies. In order to ensure that only discriminative items were included in the final MIRC, in the pilot testing phase, we utilized graded response models (GRMs), which are extensions of traditional item response models. With this approach, we summarized the discriminative ability of each item using the estimated model slope, item characteristic curve, and item information curve. Internal consistency among items designed to measure a given construct (i.e., subscale) was examined using Cronbach's alpha and intraclass correlation coefficients (ICCs). To determine how each item reflected the overall consistency, we computed the alpha coefficient for the subscale after deleting each item. In addition, we calculated the correlation of each item with the total of the remaining items in the subscale. The test-retest reliability of individual items was assessed using simple and weighted kappa coefficients, along with corresponding 95% confidence intervals. The research team then convened to review the results and make decisions about item retention and elimination as well as subscale composition.

For the final psychometric evaluation, using the revised version of the MIRC, we applied the same methods as in the pilot testing phase to assess item discrimination, subscale and total measure internal consistency, and test-retest reliability. Furthermore, we used confirmatory factor analysis to validate GRM results through examination of the factor loadings and the squared multiple correlations. Subscale scores and the total score were calculated using the simple sum of corresponding items (following reverse coding of items measuring negative capital), which were then summarized. Construct validity, in terms of the associations between MIRC subscale scores, total score, and related measures, was examined through the use of standard scatterplots and calculated correlations. The test-retest reliability of the subscales and total measure was assessed using Bland-Altman plots and calculation of ICCs based on a fitted one-way random effects model. All statistical tests were two-sided and tested at a 0.05 nominal significance level. Analyses were carried out using SAS version 9.4 (or higher) statistical software.

3. Results

3.1. Pilot testing (Phase 2) results

Following data cleaning, we completed item and scale-level analyses on pilot testing data (n=497). The research team reviewed key item performance indicators, including changes to subscale alpha when an item was deleted; correlation with the subscale remaining total; slope; and weighted kappa for the test-retest subsample (n=53). We identified 17 poorly performing items to cut from the MIRC (see Table 2). These items were problematic in terms of low correlations with subscale totals; negative impact on Cronbach's alpha;

and low slopes associated with fitted GRMs, indicating lower item discriminability. We then prepared a revised MIRC with 32 items across four subscales (seven social capital items; eight physical capital items; nine human capital items; and eight cultural capital items) for evaluation in Aim 3. GRM slopes of these items ranged from 0.61 to 3.48. We also established the MIRC's feasibility for self-administration, with 90% of participants completing the measure in under 10 minutes with few skipped items.

3.2. Psychometric evaluation (Phase 3) results

After reviewing and cleaning the data, we conducted analyses of item performance, similar to the pilot testing phase. We cut four items that performed weakly: "Having money is a trigger for me to drink or use drugs" (physical capital); "I have trouble sleeping" (human capital); "I have work (paid or unpaid) that is meaningful to me" (human capital); and "I know of good examples of people in my community who are succeeding in their recovery" (cultural capital). The resulting final MIRC contained 28 items, split equally across four subscales (see Table 3). Table 4 summarizes the distribution, reliability (Cronbach's alpha and ICC), and concurrent validity for the final MIRC and its four subscales. The full measure is available in Appendix 1.

3.2.1 Distribution and reliability—Each of the four subscales has a potential range of 7–28. The range of scores across subscales was similar at the 10th percentile, median, and 90th percentile. Mean scores for human capital and cultural capital were somewhat lower than social and physical capital scores. Mean and median scores for the full measure were nearly equal, suggesting low skewness and indicating an average per-item response of 2.75. Internal consistency was moderate to strong for each subscale (α=.65 to .81; ICC=.72 to .92) and strong for the full measure (α=.91; ICC=.91).

3.2.2 Validity—To assess concurrent validity, subscale correlations were calculated between social capital and the Brief 2-way Social Support Scale (r=.41); physical capital and domain 4 of the WHOQOL-BREF (r=.74); human capital and domains 1 (r=.55) and 2 (r=.76) of the WHOQOL-BREF; cultural capital and the sense of community subscale of the Perceived Neighborhood Scale (r=.42); and the full MIRC and the full WHOQOL-BREW (r=.76). Results from a fitted confirmatory factor analysis showed similar results as those seen with the GRM-based analysis, based on the relative magnitudes of obtained factor loadings and factor score regression coefficients.

Lastly, Table 5 shows the correlation matrix for the MIRC subscales and total measure. Correlations between subscales showed moderate strength, ranging from physical and human capital (r=.50) at the weakest to human and cultural capital (r=.71) at the strongest. Most correlations were on the order of r=.55, while cultural-social (r=.63) and cultural-human (r=.71) were higher. Correlations between each subscale and the total measure showed a stronger relationship (r=.80-.87).

4. Discussion

In this study, we sought to develop a new measure of recovery capital that improved on existing measures through greater fidelity to the theoretical construct; incorporating

qualitative and quantitative data from diverse samples with respect to race, class, gender, and recovery experience; and improving psychometric performance through GRM-based analyses. The items in the MIRC cover some of the same topics included in prior measures, such as the ARC (Groshkova et al., 2013); for example, both include items assessing social support for recovery. However, the MIRC is distinctive in its alignment with the theoretical domains of social, physical, human, and cultural capital, as specified by Cloud and Granfield (2008), and its systematic assessment of negative as well as positive capital. Our analyses indicate that the MIRC is feasible to self-administer and that the full measure and its subscales have acceptable reliability. Of note, the 10th percentile and especially 90th percentile scores for the subscales are somewhat near their range limits, indicating high variability, whereby some persons have little recovery capital and others have a high amount. This is clinically relevant and suggests sound performance with respect to item discrimination.

We also measured concurrent validity for each of the subscales (r=.41-.76) and the total measure (r=.76) comparing to other relevant, established measures. The comparative instruments assessed similar but not identical concepts and none were recovery-specific. Given this, the moderate strength of the correlations appropriately show some shared space, while maintaining conceptual distinction. For example, the sense of community subscale of the Perceived Neighborhood Scale assesses a neighborhood-based notion of community, whereas items on the cultural capital subscale of the MIRC measure broader notions of culture and community connected to recovery. Given this, the moderate correlation of r=.42 is reasonable, consistent with shared conceptual territory in the domain of community characteristics, but also differentiability between the two measures based on their conceptual distinctions. In sum, the internal consistency, test-retest reliability, and concurrent validity results all support the soundness of the measure.

In assessing theoretical model fit, we note that the face validity of items is strong, having been shaped through iterative feedback from research experts, service providers, and persons in recovery (Bowen et al., 2022). In addition, subscale and full measure correlations are consistent with a proper theoretical fit. We expected to see some, but not very high, correlation between each of the subscales given that we do not believe they are independent, but that they should differentiate. This is in fact what we discovered in the range of correlations (r=.50-.71). Further, we expected to see higher correlation between subscales and the overall measure because for any individual, any one given capital subscale may be an outlier, but overall recovery capital cannot be. This expectation was also observed in the data (r=.80-.87). In total, each subscale was substantially related to the others, though not to the degree that would call conceptual independence into question. Further, subscales were strongly but not identically related to the overall measure, suggesting that they each constitute but do not independently represent overall recovery capital.

We acknowledge some limitations regarding the MIRC and our measurement development process. First, samples across study phases were comprised of people in recovery from alcohol problems. Although many participants reported past problems with drugs other than alcohol and MIRC items do not refer specifically to alcohol, the validity of the measure for people whose recovery histories do not involve alcohol is not established. Another limitation

is that although the study samples are diverse with regard to characteristics including race, ethnicity, gender, sexual orientation, and recovery experience, they are not perfectly representative, with some groups under or over-represented in different phases.

In addition, a limitation is that relative to the other subscales, the social capital subscale had weaker internal consistency and test-retest reliability (α=.65, ICC=.72). The measurement of social capital, by nature a relatively intangible dimension of social life, poses many challenges, especially when applied to understanding a person's capacity for overcoming complex problems, such as substance use disorders (Erickson & Benton, 2019). In our study, the item that most reduced the social capital subscale alpha was "I support other people who are in recovery." Despite subpar performance, we decided to retain the item based on the research literature establishing this concept as a key factor in recovery (Krieger et al., 2021; Pagano et al., 2013; Zemore & Kaskutas, 2004). We altered the item to read "actively support" on the hypothesis that active support involving personal engagement, rather than passive "well-wishing"-type support, would better discriminate and capture the construct. While this item captures a type of bonding social capital that could expand a person's connection with others like themselves, not everyone who is in the process of recovering feels the need to bond with others in recovery, and some people may choose to deliberately withdraw (Granfield & Cloud, 1999).

Despite these limitations, the MIRC holds promise for future research. One potential use is to explore relationships between the four domains of recovery capital, an endeavor that was not possible with earlier measures that did not include social, physical, human, and cultural capital subscales. For example, future research could examine possible interactions between recovery capital domains and their effects on recovery outcomes. Broadly speaking, we see benefit in using the MIRC to understand if and how recovery capital is predictive of successful recovery outcomes based on the current NIAAA recovery definition, e.g., resolution of AUD symptoms, cessation of heavy drinking, and quality of life improvements (Hagman et al., 2022). In particular, the MIRC may be useful in understanding the role that recovery capital could play in mediating disparities in recovery outcomes for various groups (e.g. lower income people, people of color, and sexual and gender minorities) and elucidating if and how recovery capital varies for individuals on differing recovery pathways, such as those in natural recovery and those using treatment and mutual aid groups (Collins, 2016; Wagner & Baldwin, 2020). Further, it is our hope that the MIRC will also be used in practice, as a free tool for ongoing service planning and self-assessment (Neale & Bowen, 2022).

4. 1. Conclusion

In order to best support people in recovery, researchers and clinicians must have an understanding of how people view their recovery and the many factors that influence this complex process. Essential to this understanding is a high-quality recovery capital measurement tool that is resonant and accurate for those using it. The MIRC provides an improved way of quantitatively assessing recovery capital – one that is grounded in people's lived experiences, psychometrically sound, and comprehensive across four domains and positive and negative dimensions of the construct (Cloud & Granfield, 2008). As holistic

and nuanced definitions of recovery evolve (Hagman et al., 2022), greater specificity in measuring recovery capital may provide the foundation for conceptual and clinical advancements for people in recovery.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgements

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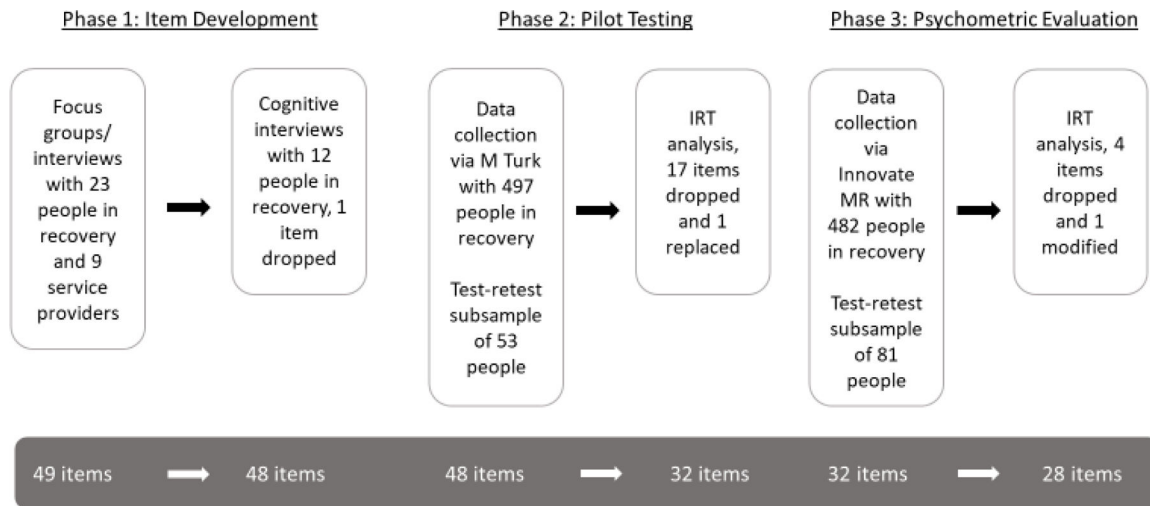
Figure 1:

Overview of MIRC development and evaluation process

Table 1:

Sample characteristics

Characteristic	Item development (Phase 1) (n=35) %	Pilot testing (Phase 2) (*n*=497) %	Psychometric evaluation (Phase 3) (*n*=482) %
Gender			
Cisgender female	57.1	43.7	48.8
Cisgender male	37.1	54.5	50.2
Other gender identities	5.7	1.6	1.0
Race			
American Indian	2.9	2.2	5.0
Asian American	0	2.8	2.9
Hawaiian / Pacific Islander	0	0	0.4
Black	34.3	8.3	11.6
White	51.4	84.5	70.8
More than one race	8.6	1.2	3.9
Other race	2.9	1.0	5.4
Hispanic/Latinx ethnicity	5.7	17.2	17.2
Sexual orientation			
Gay or lesbian	5.7	4.8	6.0
Heterosexual	68.6	77.8	83.0
Bisexual	22.9	16.3	8.3
Other	2.9	1.0	1.9
Age in years (*M*)	44	39	43
Education – bachelors or greater	54.3	72.6	25.7
Low-income (< 200% federal poverty level)	42.9	45.4	40.9
Time since resolving alcohol problems			
> 5 years	40.0	13.1	34.0
1–5 years	14.3	14.8	40.9
6–12 months	17.1	20.3	10.0
3–6 months	20.0	29.1	7.1
1–3 months	8.6	22.8	8.1
Treatment and self-help group history			
Ever received inpatient treatment	45.7	19.3	27.6
Ever received outpatient treatment	52.9	33.1	39.4
Attended self-help groups in past 30 days (in person or online)	54.3	34.8	23.7
Attended self-help groups previously but not in past 30 days	22.9	29.2	39.8
Natural recovery	8.6	23.1	31.7
SIP Score (range 0–15) – Alcohol (*M*)	12.5	9.4	10.2
Current alcohol use			
None	62.9	24.4	47.7
Monthly or less	25.7	22.5	25.5
2–4 times/month	2.9	27.8	13.1
Weekly or greater	8.6	25.4	13.7

Note. Natural recovery was defined as having no lifetime history of participation in inpatient treatment, outpatient treatment, or any self-help group (online or in-person).

Table 2:

MIRC items dropped in pilot testing (n=497)

Item and Subscale	Subscale α with item deleted	Correlation with subscale remaining total	Slope (SE)	Weighted kappa
Social Capital (α = .63)				
People using alcohol or drugs around me makes my recovery more difficult.	.67	.12	0.28 (.11)	.56
Physical Capital (α = .73)				
I have a steady job (full-time or part-time).	.73	.19	0.81 (.14)	*
My legal problems cause me stress.	.73	.18	0.50 (.13)	*
Having a criminal record is a barrier to my recovery.	.74	.14	0.31 (.12)	*
Human Capital (α = .81)				
I have effective coping skills that I use in my recovery.	.80	.41	1.03 (0.12)	.30
I have a hopeful outlook on my recovery.	.81	.39	0.92 (.12)	.56
I feel mentally healthy most days.	.80	.53	1.47 (.15)	.52
I have problems with my physical health.	.80	.64	1.33 (.14)	*
I have a spiritual practice that helps me in recovery.	.82	.17	0.46 (.10)	.80
I have a job that is meaningful to me.	.82	.10	0.23 (.11)	*
There are activities I enjoy doing without using alcohol or drugs.	.82	.19	0.55 (.10)	.20
Cultural Capital (α = .67)				
I would have a lot to lose if my alcohol or drug problem came back.	.72	.06	0.18 (.01)	.46
I help out with what's needed in my community.	.68	.20	0.75 (.11)	.62
Discrimination related to my race, gender, or sexual orientation is making my recovery harder.	.66	.32	0.84 (.11)	.63
Community Capital (α = .61)				
I feel like people judge me because of my past problems with alcohol or drugs.	.61	.21	0.48 (.12)	.63
There are not a lot of programs or services for people in recovery like me in my neighborhood or town.	.58	.30	0.87 (.14)	.28
It's hard to avoid the alcohol and drug use in my neighborhood or town.	.55	.37	1.01 (.17)	.37

*
Item included a "not applicable" response option making the weighted kappa inappropriate

Table 3:

Items performance for final MIRC (n=482)

Item and subscale	Subscale α with item deleted	Correlation with subscale remaining total	Slope (SE)	Weighted kappa
Social Capital (α = .65)				
I actively support other people who are in recovery.	.67	.12	0.37 (.13)	.28
My family makes my recovery more difficult.	.56	.47	1.58 (.20)	.52
I have at least one friend who supports my recovery.	.61	.38	1.22 (.18)	.56
My family supports my recovery.	.57	.52	2.33 (.37)	.37
Some people in my life do not think I'll make it in my recovery.	.65	.25	0.73 (.13)	.65
I feel alone.	.56	.50	1.52 (.20)	.78
I feel like I'm part of a recovery community.	.63	.30	0.81 (.12)	.56
Physical Capital (α = .81)				
My housing situation is helpful for my recovery.	.79	.51	1.52 (.15)	.76
I have difficulty getting transportation.	.79	.52	1.67 (.11)	.74
My housing situation is unstable.	.76	.70	3.04 (.16)	.78
I have enough money every week to buy the basic things I need.	.77	.64	2.08 (.35)	.65
Not having enough money makes my recovery more difficult.	.79	.51	1.51 (.20)	.64
I can afford the care I need for my health, mental health, and recovery.	.78	.58	1.77 (.15)	.68
I have reliable access to a phone and the internet.	.81	.38	1.23 (.17)	.31
Human Capital (α = .80)				
I find it hard to have fun.	.77	.55	1.62 (.16)	.79
I feel physically healthy most days.	.80	.39	1.03 (.12)	.71
I am struggling with guilt or shame.	.77	.59	2.05 (.19)	.81
I am experiencing a lot of stress.	.76	.63	2.47 (.25)	.78
My education and training have prepared me to handle life's challenges.	.80	.40	0.94 (.18)	.62
I have problems with my mental health.	.76	.63	2.30 (.22)	.77
I feel my life has purpose and meaning.	.77	.54	1.43 (.15)	.72
Cultural Capital (α = .78)				
It's hard for me to trust others.	.76	.47	1.24 (.13)	.69
I have opportunities to participate in fun activities that do not involve drugs and alcohol.	.75	.50	1.22 (.14)	.63
I feel disconnected from my culture or not part of any culture.	.73	.60	2.55 (.24)	.74
I feel like an outcast.	.71	.68	3.80 (.49)	.75
There are helpful services and resources accessible to me.	.77	.40	1.04 (.13)	.72
It's hard to let go of the part of my identity that was linked to my drinking or drug use.	.76	.48	1.35 (.14)	.65
My neighborhood or town feels safe.	.78	.37	0.86 (.12)	.68

Table 4:

Distribution, reliability, and validity of final MIRC and subscales (n=482)

	10th percentile score	Median score	90th percentile score	*M* (SD)	α	ICC	Concurrent validity correlation[*]
Social Capital	17	21	26	20.8 (3.5)	.65	.72	.41
Physical Capital	15	21	27	20.6 (4.5)	.81	.87	.74
Human Capital	11	17	23	17.6 (4.1)	.80	.92	.55
Cultural Capital	12	18	23	18.4 (3.8)	.78	.85	.42
Total Measure	55	77	95	77.4 (13.1)	.91	.91	.76

[*] Social Capital: Brief 2-way Social Support Scale; Physical Capital: WHOQOL-BREF Domain 4; Human Capital: WHOQOL-BREF Domains 1, 2; Cultural Capital: Perceived Neighborhood Scale - Sense of Community Subscale; Total MIRC: WHOQOL-BREF total score

Table 5:

Correlation matrix for MIRC subscales and total measure (n=482)

	Social Capital	Physical Capital	Human Capital	Cultural Capital	Total Measure
Social Capital	1	-	-	-	-
Physical Capital	.56	1	-	-	-
Human Capital	.55	.50	1	-	-
Cultural Capital	.63	.55	.71	1	-
Total Measure	.81	.80	.83	.87	1