

Adaptation of the Multidimensional Inventory of Recovery Capital (MIRC) to the Czech Environment

KOMRSKA, ŠTĚPÁN¹, PLÍHAL, DOMINIK¹, BOWEN, ELIZABETH²

1 | Department of Psychology, Palacký University in Olomouc, Czech Republic

2 | School of Social Work, University at Buffalo, State University of New York, United States

Citation | Komrska, Š., Plíhal, D., & Bowen, E. (2026). Adaptation of the Multidimensional Inventory of Recovery Capital (MIRC) to the Czech environment. *Adiktologie*, 26(2), 109–120.

INTRODUCTION: While international attention toward addiction recovery research is growing, in the Czech environment there is still a lack of research data and tools for measuring this concept. The primary objective of the research project was therefore to adapt and validate the Multidimensional Inventory of Recovery Capital (MIRC) for the Czech population. **METHODS:** The study included 111 respondents recovering from alcohol addiction who met the original inclusion criteria. An interactive web application was created for data collection, which continues to be used in practice by recovery coaches and individuals in recovery.

RESULTS: Psychometric evaluation confirmed strong internal consistency (Cronbach's $\alpha = .92$; McDonald's $\omega = .92$) and significant concurrent validity, with the total recovery capital score showing a strong positive correlation with quality of life, as measured by the WHOQOL-BREF ($r = .83$). Further analyses supported the MIRC as an overall measure of recovery capital, while

indicating limited distinctiveness between the social, human, and cultural capital domains. **CONCLUSIONS:** The Czech adaptation of the MIRC provides a promising instrument for measuring recovery capital. This method introduces an effective framework that can be further integrated into Czech addiction science and recovery-oriented practice. Its practical application may support individualized treatment planning, recovery coaching, and routine outcome monitoring, as well as the evaluation of recovery services.

Keywords | MIRC – recovery – adaptation – addiction recovery – recovery capital

Submitted | March 13, 2026

Accepted | August 18, 2026

Grant affiliation | The funding for the research paper was provided by the Czech Ministry of Education, Youth and Sports for specific research (IGA_FF_2024_016).

AI Statement | During the preparation of this manuscript, the authors used ChatGPT-5.2 Instant (OpenAI) to improve readability, language, and the formulation of results. Claude Opus 5 (Anthropic) and GPT-5.6 Luna (OpenAI) were consulted regarding the procedures and reporting of selected statistical analyses, and Claude Opus 5 (Anthropic) was used to assist in generating R code. All AI-assisted content and code were reviewed and verified by the authors, who take full responsibility for the analyses, interpretation, and final content of the manuscript.

Corresponding author | Štěpán Komrska, Palacký University in Olomouc, Faculty of Art, Department of Psychology, Vodární 6, 779 00, Olomouc, Czech Republic

stepan.komrska01@upol.cz

1 INTRODUCTION

Habits associated with substance misuse have far-reaching consequences that affect not only individuals themselves, but also their loved ones and their entire community. This issue touches on various areas of life, from personal well-being to social relationships and the health of society. Alcohol consumption among the Czech population has long been high, corresponding to 10 liters of pure alcohol per capita annually. Nearly 10% of the adult population drinks alcohol daily, and the proportion of everyday consumers has remained stable over the long term. Frequent excessive drinking is reported by 12% of the population (National Monitoring Centre for Drugs and Addiction, 2023). Despite the serious social consequences associated with addiction, this condition is frequently accompanied by significant social stigma directed toward affected individuals. Such individuals are often framed as having failed and lacking the motivation or capacity for social reintegration; this framing is evident both in public discourse and among some helping professionals (Frank & Nagel, 2017).

In the International Classification of Diseases (ICD-11), disorders due to substance use encompass conditions arising from the use of psychoactive substances, such as alcohol, cannabis, and opioids. A key clinical entity within this category is **substance dependence**, characterized by impaired control over consumption and continued use despite adverse consequences. It may also lead to cravings and physiological signs of addiction, such as tolerance and withdrawal symptoms (WHO, 2019). The **biopsychosocial model** emphasizes that the development of addiction is influenced by a combination of biological, psychological, and social factors. In addition to genetic predispositions and biological influences, it includes psychological aspects like readiness for change, as well as social factors such as family and cultural environment. This approach to prevention and treatment requires a comprehensive consideration of all these factors (Volkow & Blanco, 2023). In our work, we will focus on the biopsychosocial model and specifically on the topic of recovery from addiction. While there is a growing interest in recovery research in international literature, in the Czech context, there is a notable lack of primary research in this area (Plíhal, 2025).

Ashford et al. (2019) define recovery as “*an individualized, intentional, dynamic, and relational process involving sustained efforts to improve wellness.*” In the field of substance use disorder research, this concept has historically been associated with treatment and abstinence, but in recent decades its meaning has broadened and today it is understood more as a complex and long-term process based on the biopsychosocial model (Witkiewitz et al., 2020). This article adopts the working definition of recovery established by the Substance Abuse and Mental Health Services Administration (SAMHSA, 2012): “*Recovery is a process of change through which individuals improve their health and wellness, live a self-directed life, and strive to reach their full potential.*”

In the Czech context, the concept of recovery has so far been used only to a very limited extent and is largely absent from both academic discussion and practical applications in addictology. This limited engagement is also reflected at the policy level: the term **recovery** is not mentioned in the National Strategy

to Prevent and Reduce the Harm Associated with Addictive Behaviour (Government of the Czech Republic, 2019), even though its recognition could represent a crucial step toward improving the quality of life of individuals with addiction. Taken together, this indicates that the concept of recovery has not yet been firmly established within the Czech professional and policy environment.

Sociologist Pierre Bourdieu (1986) laid the foundations for **capital research**, defining it as a collection of resources that can be used to gain advantages or social status. Robert Granfield and William Cloud (1999) later adapted Bourdieu's concept of capital to describe resources useful in overcoming addiction. Based on their research on natural recovery (recovery without professional help), they coined the term **recovery capital**, which refers to the personal and systemic resources necessary for recovery. Their concept emphasizes that recovery depends not only on individual willpower, but also on the availability of resources in a person's environment. **Natural recovery** from the perspective of research was captured in a review study by Sobell et al. in 2000, which drew on 38 research projects to highlight the most important factors for effective recovery, including social support and relationships with loved ones, related changes in social environment, life circumstances, employment, as well as individual interests. According to the authors, all these factors can reduce the likelihood of relapses.

The specific unification and establishment of dimensions was then ensured by Cloud and Granfield in 2008, when they described recovery capital as a **multidimensional concept** consisting of four factors: **human, social, physical, and cultural capital**. Human capital encompasses knowledge, skills, and personal variables important for achieving goals (e.g., higher education). Physical capital is defined as the sum of financial resources (financial security or stable housing). According to the authors, social capital represents interpersonal relationships and community ties. The fourth dimension, cultural capital, refers to the values and cultural norms that individuals can use to support their recovery (Cloud & Granfield, 2008). The conceptualization of recovery capital domains is not entirely uniform across the literature. While the four-domain model distinguishes human, social, physical and cultural capital, alternative frameworks have proposed different organizations, including personal, social, and community recovery capital. Despite differences in the number and labels of domains, these conceptualizations cover substantially overlapping areas and consistently encompass recovery resources at the individual, interpersonal, and environmental levels (Bowen & Hennessy, 2025).

Cloud and Granfield's (2008) concept of recovery capital mirrors the framework of well-being, which includes quality of life and the ability to function meaningfully. Cano et al. (2017) demonstrated with a sample of residential treatment clients that recovery capital significantly predicts well-being. Employing the Assessment of Recovery Capital tool (Groshkova et al., 2013), they identified two primary components: personal capital (mental and physical health, risk management, everyday functioning) and social capital (meaningful activities, social support, quality and safety of housing, civic participation).

Measuring Recovery Capital

The first tool designed to measure recovery capital was the Assessment of Recovery Capital (ARC), introduced by Groshkova et al. (2013) as a fifty-item dichotomous scale measuring recovery capital in the dimensions of social and personal capital. Vilsaint et al. (2017) subsequently created a shorter version of the ARC questionnaire. Using item response theory (IRT), they developed a ten-item Brief Assessment of Recovery Capital (BARC-10), which, unlike the ARC, uses a six-point Likert scale instead of dichotomous responses. The shortened version was intended to be more practical for use in research and clinical practice. Although the ARC method is widely used, Bowen et al. (2020) reported that the questionnaire has low internal consistency and that the original ten-factor model was not confirmed in confirmatory factor analysis. Arndt et al. (2017) also point out the high collinearity and recommend using the inventory rather than working with individual domains of the scale separately.

Less frequently used methods include the Recovery Capital Questionnaire (RCQ) (Burns, 2012), Strengths and Barriers Recovery Scale (SABRS) (Best et al., 2020), and REC-CAP (Cano et al., 2017). The RCQ was constructed according to the concept of recovery capital proposed by Cloud and Granfield (2008). It is important to mention SABRS (2020) as a measure in which recovery capital was examined as a unidimensional variable. REC-CAP (2017) is a set of measurement items organized into scales and four open-ended questions focused on individual needs in the recovery process. A positive aspect of this ARC-based tool is that it was designed primarily for practicing professionals and peer workers.

Bunaciu et al. (2024) summarize various approaches to measuring recovery capital in their review of 69 studies from 2016–2023. They report that the available questionnaires are generally considered valid, but there is still insufficient evidence of their psychometric quality across different groups of respondents. Bowen et al. (2023) point out that most tools do not take into account the concept of negative capital according to Cloud and Granfield (2008), which encompasses barriers and deterrents to recovery. Patton et al. (2022) also state that barriers such as bad experiences with professionals, stigmatization, or unstable housing can significantly disrupt long-term recovery. Bowen et al. (2023) also suggest that people with experience of addiction have been involved only to a limited extent in the creation of existing inventories, and where they have been involved, it has often been within highly homogeneous groups. These shortcomings led them to create their own tool – Multidimensional Inventory of Recovery Capital (MIRC), which assesses recovery capital in adults at various stages of the recovery process and is applicable across a wide range of settings, from outpatient care to self-assessment (Best & Hennessy, 2025; Bowen et al., 2023).

2 METHODS

Instruments

Multidimensional Inventory of Recovery Capital (MIRC)

The MIRC contains 28 items divided into four domains: social, physical, human, and cultural capital. Each domain has seven items capturing both positive and negative capital, with respondents rating their answers on a four-point scale (Strongly Disagree, Disagree, Agree, Strongly Agree). Scores for each domain range from 7 to 28, while the total score ranges from 28 to 112 points (Bowen et al., 2023).

The authors tested the MIRC with a U.S. sample of people in recovery from alcohol problems (N=482) and reported that the total score of the MIRC and its domains demonstrate good reliability, though internal consistency was lowest for the social capital subscale. They also highlight the wide range between the 10th and 90th percentiles, which confirms the discriminatory power of the instrument. Furthermore, acceptable concurrent validity was found, suggesting that recovery capital is a distinct construct moderately to strongly correlated with related variables, such as quality of life.

Bowen et al. (2023) further state that the MIRC is suitable for independent completion, with 90% of respondents able to complete it within ten minutes. This makes it a useful self-assessment tool for identifying strengths that can support the recovery process or highlight areas that may slow it down (Krentzman & Gass, 2025).

As the MIRC was previously unavailable in Czech, the aim of Plíhal's project (2025) was to adapt it to the Czech context using back-translation procedures and to verify its psychometric properties. Three people participated in translating the MIRC into Czech (the author of the work, a translation studies expert, and an addiction specialist). They created three independent translations, which were compared, and any discrepancies were consulted with the lead author of the original English version of the MIRC, Elizabeth Bowen. This resulted in a unified Czech version, which was then subjected to back-translation by a bilingual translator. A comparison of the original and the back-translation revealed no significant semantic differences (Plíhal, 2025).

Comprehensibility was verified through cognitive interviews with six recovery coaches with experience of addiction. The participants identified unclear formulations and suggested alternative wording for specific items. The discussion led to several minor adjustments (Plíhal, 2025).

WHOQOL-BREF

WHOQOL-BREF is an internationally used quality of life questionnaire that assesses four domains in 26 items on a five-point scale: physical health, mental health, social relationships, and environment. The Czech version was standardized at the Prague Psychiatric Center (Dragomirecká & Bartoňová, 2006), and the tool is characterized by good reliability and validity verified in numerous countries. Given that quality of life is closely related

to recovery capital, and considering that the WHOQOL-BREF was also employed by Bowen et al. (2023) in their validation of the MIRC, it was also used as a comparative measure in this study.

Procedure

The psychometric properties of the Czech version of the MIRC were verified through an online questionnaire survey. For this purpose, a web application was created that enabled both data collection and automatic display of summary results of recovery capital. The aim was to increase the motivation of respondents by providing them with immediate visual feedback upon submission, but also to provide a practical tool for use by recovery coaches and individuals in the recovery process.

The web application consisted of five sections: (1) an introduction with information about the research; (2) the Czech version of the WHOQOL-BREF for measuring quality of life; (3) the translated MIRC with instructions and an explanation of recovery; (4) the collection of sociodemographic data; (5) and a final page with consent and the option to view the results of the recovery capital assessment.

Participation in the research was voluntary and anonymous, with no collection of personally identifiable information. Respondents were informed in advance about the purpose of the study and, by completing the questionnaire, consented to the processing of their data. The data were handled in accordance with the ethical principles of Palacký University in Olomouc on the protection of personal data.

Participants

The criteria for selecting participants were consistent with those used in the development of the original MIRC (Bowen et al., 2023). Eligible participants had to be at least 18 years of age and to perceive their alcohol addiction as being under control for a minimum of 30 days. Eligibility was verified through specific screening items embedded in the questionnaire. Participants were asked: *“How long have you had your addiction under control?”*, with response options presented as predefined time intervals. They were also asked: *“Would you consider alcohol to be the substance on which you developed your primary addiction?”* Respondents were included if they answered “Yes”, or if they selected *“No, but alcohol is among the substances on which I developed an addiction.”*

Participants were recruited using a combination of self-selection, convenience sampling, and snowball sampling. The study was disseminated via online abstinence-oriented groups, collaboration with clinical and aftercare facilities, contact with anti-drug coordinators, an online seminar, and a professional article, each accompanied by a request for further distribution. Recruitment also involved cooperation with Inboox, a private company specializing in book-related services, public research, and data analysis that operates its own respondent panel. Although 216 individuals completed the survey, only 111 represented unique cases and met all eligibility criteria (Plíhal, 2025).

Statistical analysis

The data collected via the web application were analyzed using Statistica, version 14.0.0.15. Confirmatory factor analysis, McDonald's omega, the heterotrait–monotrait (HTMT) ratios were computed in R 4.3.3 using the lavaan 0.6-17 (Rosseel, 2012) and semTools 0.5-6 (Jorgensen et al., 2022) packages. Prior to statistical processing, data were cleaned in Microsoft Excel by removing responses that did not meet the inclusion criteria and by identifying duplicate records. The dataset contained no missing values. Reverse-scored MIRC items were recoded, and total and domain-specific recovery capital scores were computed according to the procedure described by the MIRC authors. Descriptive statistics were subsequently calculated to characterize both the total recovery capital score and its four domains.

To assess the internal consistency of the Czech version of the MIRC, Cronbach's alpha coefficients and item–total Pearson correlations were computed for each domain. Item properties were further examined by evaluating changes in alpha after item deletion. McDonald's omega was additionally estimated using the Green and Yang (2009) approach for ordinal response scales.

As the four-domain structure of the MIRC was established in the original validation of the instrument, the Czech adaptation was evaluated by confirmatory factor analysis of that hypothesized structure rather than by a preliminary exploratory analysis. Given that the items are answered on a four-point ordinal response scale, the model was estimated from the matrix of polychoric correlations and item thresholds using the ULSMV estimator. A WLSMV solution was additionally computed as a sensitivity analysis to assess the robustness of the results to the choice of estimator. Fit was evaluated using the scaled χ^2 , CFI, TLI, RMSEA, and SRMR. Because least-squares estimators applied to polychoric correlations tend to yield more favorable RMSEA, CFI, and TLI values than maximum likelihood at the same degree of misspecification (Xia & Yang, 2019), conventional cutoff values (Hu & Bentler, 1999) were considered alongside factor loadings, squared multiple correlations, and the pattern of latent correlations. For each item, the factor loading is reported together with its robust standard error, z-statistic, p-value, and squared multiple correlation, which expresses the proportion of variance in the item accounted for by its domain. The statistical power of the test of close fit (RMSEA .05 vs. .08) was computed for the model degrees of freedom and sample size. The model was retained in its hypothesized form; given the sample size ($n = 111$), modification indices were inspected but not used as a basis for respecification.

Discriminant validity was assessed in two ways. For each pair of latent variables, the hypothesized model was compared with a model constraining their correlation to unity, using a scaled difference test (Satorra, 2000). In addition, HTMT ratios were computed from the polychoric correlations, with values above .85 indicating insufficient discrimination (Henseler et al., 2015).

The hypothesized four-domain model was further compared with the following alternative measurement models: a one-factor model, a two-factor model separating physical capital from the remaining items, a three-factor model combining social and

cultural capital, and a second-order model in which the four domains loaded on a single higher-order recovery capital factor.

Scores from the WHOQOL-BREF questionnaire were calculated for the analysis of concurrent validity. Pearson correlations were computed between quality of life and both the total recovery capital score and the four domain scores; differences between these dependent correlations were tested using Steiger's test. Two regression models predicting quality of life were then compared, the first including the total score alone and the second the four domain scores entered simultaneously.

3 RESULTS

The Czech sample consisted of 111 respondents with a median age of 43. The gender distribution was almost equal, with 48.6% of respondents identifying as women, 50.5% as men, and 0.9% as other genders. Regarding education, 20.7% of participants held a bachelor's degree or higher. Table 1 compares the socio-demographic characteristics of the Czech sample with those of the original validation sample (Bowen et al., 2023).

The internal consistency of the Czech version of the MIRC was assessed using Cronbach's alpha, which reached $\alpha = .92$ for the overall scale and ranged from .72 (human capital) to .86 (physical capital) across the individual domains. McDonald's omega was .92 for the overall scale, based on a unidimensional model, and ranged from .71 (human capital) to .87 (physical capital) across the individual domains. Pearson item-total correlations were calculated for each domain, together with the change in Cronbach's alpha following item deletion.

Two items demonstrated comparatively weaker psychometric properties. Item 28 was the weakest item in the instrument on every indicator examined. It showed the lowest item-total correlation ($r = .20$), the lowest standardized factor loading in the confirmatory factor analysis ($\lambda = .41$, $SE = .11$, $z = 3.74$), and the lowest squared multiple correlation ($R^2 = .17$), indicating that the cultural capital domain accounted for less than a fifth of its variance. Its removal was also the only instance in which Cronbach's alpha increased appreciably within a domain, rising from .78 to .81 for cultural capital. Item 16 ranked second weakest on the same three indicators ($r = .28$; $\lambda = .45$, $SE = .11$, $z = 4.28$; $R^2 = .20$), but its removal left the alpha of the human capital

Table 1 | Comparison of sociodemographic characteristics in the original (Bowen et al., 2023) and Czech (Plíhal, 2025) MIRC study samples

Sample	Women (%)	Men (%)	Other (%)	Median Age	University Education (%)	Recovery Duration:				
						1–3 months (%)	3–6 months (%)	6–12 months (%)	1–5 years (%)	>5 years (%)
Original MIRC (n = 482)	48.8	50.2	1.0	43	25.7	8.1	7.1	10.0	40.9	34.0
Czech MIRC (n = 111)	48.6	50.5	0.9	43	20.7	15.3	13.5	9.9	34.2	27.0

Descriptive statistics were calculated for the total recovery capital score and for the four domains (social, physical, human, and cultural capital). The median total score was 81 (10th percentile = 68; 90th percentile = 98), with a mean of 81.8 ($SD = 11.4$) and an observed range of 57 to 111 against a potential range of 28 to 112. Skewness and kurtosis indicated approximately symmetric distributions for the total score and for all four domains (skewness -0.27 to 0.34 ; kurtosis -0.93 to 0.01). Physical capital yielded the highest scores ($M = 21.9$, $SD = 3.9$), while human capital recorded the lowest ($M = 19.0$, $SD = 3.1$). Detailed descriptive statistics are presented in Table 2.

domain unchanged (.72). An overview of all values obtained is presented in Table 3.

Table 4 presents the correlation matrix of the four domains and the total score. The total score correlated strongly with all domains ($r = .79-.88$), as would be expected given that each domain forms one quarter of the total score. The domains also correlated substantially with one another ($r = .51-.77$), with the strongest association observed between social and cultural capital ($r = .77$) and the weakest between social and physical capital ($r = .51$). HTMT ratios ranged from .66 to .99. Three do-

Table 2 | Descriptive statistics for the total and domain scores of the Czech version of the MIRC (n = 111) (Plíhal, 2025)

Domain	Min.	10th pct.	Median	90th pct.	Max.	Mean (SD)	Range (Min–Max)	p90–p10 Range	Skewness	Kurtosis
Social Capital	15	17	20	26	28	21.2 (3.3)	13	9	0.34	–0.93
Physical Capital	9	17	21	27	28	21.9 (3.9)	19	10	–0.27	–0.05
Human Capital	11	15	19	23	27	19.0 (3.1)	16	8	0.06	0.01
Cultural Capital	13	16	20	24	28	19.7 (3.2)	15	8	0.27	–0.15
Total Score	57	68	81	98	111	81.8 (11.4)	54	30	0.32	–0.49

Table 3 | Selected psychometric indicators of items and individual domains in the Czech version of the MIRC (n = 111) (Plíhal, 2025)

Domain and item	Mean (SD)	α if item deleted	Corrected item-total correlation	λ	SE	z	p	R ²
Social Capital ($\alpha = .76$; $\omega = .77$)								
1. I actively support other people who are in recovery.	3.16 (.64)	.74	.46	.52	.102	5.05	< .001	.27
2. My family makes my recovery more difficult.	3.17 (.75)	.73	.52	.64	.081	7.92	< .001	.42
3. I have at least one friend who supports my recovery.	3.30 (.75)	.73	.48	.59	.089	6.69	< .001	.35
4. My family supports my recovery.	3.32 (.68)	.73	.51	.66	.095	6.94	< .001	.44
5. Some people in my life do not think I'll make it in my recovery.	2.62 (.75)	.76	.36	.58	.121	4.78	< .001	.34
6. I feel alone.	2.62 (.80)	.72	.54	.83	.052	15.96	< .001	.69
7. I feel like I'm part of a recovery community.	3.01 (.76)	.73	.51	.58	.072	8.04	< .001	.33
Physical Capital ($\alpha = .86$; $\omega = .87$)								
8. My housing situation is helpful for my recovery.	3.05 (.67)	.86	.52	.63	.112	5.65	< .001	.40
9. I have difficulty getting transportation.	3.10 (.70)	.84	.68	.80	.080	10.02	< .001	.64
10. My housing situation is unstable.	3.11 (.84)	.83	.69	.68	.112	6.07	< .001	.46
11. I have enough money every week to buy the basic things I need.	3.16 (.76)	.83	.73	.82	.063	13.01	< .001	.67
12. Not having enough money makes my recovery more difficult.	2.98 (.92)	.83	.71	.85	.068	12.52	< .001	.72
13. I can afford the care I need for my health, mental health, and recovery.	2.94 (.78)	.85	.56	.79	.079	10.01	< .001	.62
14. I have reliable access to a phone and the internet.	3.51 (.55)	.85	.57	.72	.085	8.49	< .001	.52
Human Capital ($\alpha = .72$; $\omega = .71$)								
15. I find it hard to have fun.	2.74 (.73)	.68	.46	.68	.075	9.14	< .001	.46
16. I feel physically healthy most days.	2.96 (.67)	.72	.28	.45	.105	4.28	< .001	.20
17. I am struggling with guilt or shame.	2.45 (.76)	.71	.35	.48	.086	5.57	< .001	.23
18. I am experiencing a lot of stress.	2.41 (.74)	.67	.51	.52	.098	5.27	< .001	.27
19. My education and training have prepared me to handle life's challenges.	2.86 (.68)	.71	.37	.45	.092	4.96	< .001	.21
20. I have problems with my mental health.	2.63 (.80)	.66	.54	.57	.089	6.35	< .001	.32
21. I feel my life has purpose and meaning.	2.95 (.72)	.67	.53	.80	.056	14.25	< .001	.64
Cultural Capital ($\alpha = .78$; $\omega = .81$)								
22. It's hard for me to trust others.	2.34 (.63)	.78	.38	.51	.113	4.51	< .001	.26
23. I have opportunities to participate in fun activities that do not involve drugs and alcohol.	3.01 (.69)	.74	.57	.69	.065	10.58	< .001	.48
24. I feel disconnected from my culture or not part of any culture.	2.78 (.73)	.72	.66	.73	.061	11.91	< .001	.53
25. I feel like an outcast.	2.86 (.72)	.71	.72	.85	.040	21.55	< .001	.73
26. There are helpful services and resources accessible to me.	3.02 (.57)	.75	.54	.79	.062	12.81	< .001	.62
27. It's hard to let go of the part of my identity that was linked to my drinking or drug use.	2.86 (.81)	.75	.54	.65	.078	8.31	< .001	.42
28. My neighborhood or town feels safe.	2.86 (.71)	.81	.20	.41	.111	3.74	< .001	.17

Note. α = Cronbach's alpha. ω = McDonald's omega. λ = standardized factor loading from the four-factor confirmatory model (ULSMV). SE = robust standard error. $z = \lambda/SE$. R^2 = squared multiple correlation, the proportion of item variance accounted for by its domain. Standard errors are approximate given the sample size.

Table 4 | Correlation matrix of the domains and total score of the Czech version of the MIRC (n = 111) (Plíhal, 2025)

	Social Capital	Physical Capital	Human Capital	Cultural Capital	Total Score
Social Capital	–	.66	.89	.99	–
Physical Capital	.51	–	.72	.68	–
Human Capital	.67	.55	–	.92	–
Cultural Capital	.77	.54	.68	–	–
Total Score	.86	.79	.85	.88	–

Note. Pearson correlations below the diagonal, HTMT above. HTMT values above .85 are shown in bold.

main pairs exceeded the commonly recommended threshold of .85: social and cultural capital (.99), human and cultural capital (.92), and social and human capital (.89). These findings suggest substantial overlap among three of the four domains, which was examined further in subsequent analyses.

The hypothesized four-domain structure was tested by confirmatory factor analysis. The model converged without inadmissible estimates but did not meet conventional criteria for acceptable fit: $\chi^2(344) = 547.94$, $p < .001$; CFI = .906; TLI = .897; RMSEA = .073, 90% CI [.062, .085]; SRMR = .100. A sensitivity analysis using WLSMV led to the same conclusion (CFI = .905; TLI = .896; RMSEA = .088). With 344 degrees of freedom, the power of the test of close fit (RMSEA .05 vs. .08) reached .99. Despite the moderate sample size (n = 111), all factor loadings differed significantly from zero ($z = 3.74$ to 21.55 , all $p < .001$) and ranged from .41 to .85, with robust standard errors between .04 and .12. Squared multiple correlations ranged from .17 to .73; four items fell below .25, three of them in the human capital domain (Table 3).

The shortfall in fit was related to limited discrimination among the domains. Social, human, and cultural capital correlated be-

tween .91 and .97 at the latent level. Constraining the correlation between social and cultural capital or between social and human capital to unity, that is, treating the two domains concerned as a single factor, did not worsen model fit ($\Delta\chi^2(1) = 0.62$, $p = .431$, and $\Delta\chi^2(1) = 3.12$, $p = .078$, respectively; $\Delta\text{CFI} = .000$ in both cases). The constraint on the correlation between human and cultural capital produced a statistically significant but negligible change in CFI ($\Delta\chi^2(1) = 5.71$, $p = .017$; $\Delta\text{CFI} = -.001$). Physical capital, in contrast, showed substantially stronger evidence of distinctiveness from each of the remaining domains, with all constraints producing larger decrements in fit ($\Delta\chi^2(1) = 27.11$ – 44.76 , all $p < .001$; $\Delta\text{CFI} = -.011$ to $-.026$).

A final set of comparisons addressed whether a more parsimonious structure would fit the data equally well. A two-factor model separating physical capital from the remaining items and a three-factor model combining social and cultural capital both achieved a comparable level of fit while being more parsimonious (CFI = .908 and .909, respectively), whereas the one-factor solution fitted appreciably worse (CFI = .863). Detailed results of the discriminant validity analyses and model comparisons are presented in Table 5.

Table 5 | Discriminant validity tests and fit of competing measurement models for the Czech version of the MIRC (n = 111)

Panel A. Tests of discriminant validity						
Domain pair	<i>r</i>	$\Delta\chi^2(1)$	<i>p</i>	ΔCFI		
Social – Physical	.669	41.75	< .001	-.020		
Social – Human	.906	3.12	.078	.000		
Social – Cultural	.973	0.62	.431	.000		
Physical – Human	.719	27.11	< .001	-.011		
Physical – Cultural	.649	44.76	< .001	-.026		
Human – Cultural	.915	5.71	.017	-.001		
Panel B. Fit of competing measurement models						
Model	χ^2	<i>df</i>	CFI	TLI	RMSEA	SRMR
One-factor	647.63	350	.863	.853	.088	.115
Two-factor (physical vs. remaining items)	550.46	349	.908	.900	.072	.101
Three-factor (social and cultural merged)	546.41	347	.909	.900	.072	.101
Four-factor (hypothesised)	547.94	344	.906	.897	.073	.100

Note. *r* = correlation between latent variables. $\Delta\chi^2$ and ΔCFI compare each constrained model with the hypothesized four-factor model. All fit indices are scaled values.

Consistent with Bowen et al. (2023), concurrent validity was examined by assessing the correlation between the total recovery capital score and quality of life measured by the WHOQOL-BREF. The Pearson correlation coefficient was $r = .83$, demonstrating a strong positive association between recovery capital and quality of life.

The four domains showed similarly strong correlations with quality of life ($r = .65$ for physical, $.71$ for cultural, $.72$ for social, and $.74$ for human capital), with no statistically significant differences between them (Steiger's test, all $p \geq .111$). In line with the observed overlap among domains, entering the four domain scores simultaneously into a regression model did not improve the prediction of quality of life compared with the total score alone ($R^2 = .702$ vs. $.696$; $F(3, 106) = 0.74$, $p = .529$).

4 DISCUSSION

The project focused on introducing the Multidimensional Inventory of Recovery Capital (MIRC) into the Czech context. This tool allows us to identify factors that support or hinder the process of recovery from addiction and is based on the concept of recovery capital. The adaptation process took place in several stages. First, a Czech version of the inventory was created using back-translation and cognitive interviews, then the tool was digitized and validated with a population of individuals in recovery. The analysis focused on assessing psychometric properties, particularly reliability and validity. The psychometric evaluation also included correlations among domain scores, confirmatory factor analysis (CFA), and the heterotrait–monotrait (HTMT) ratios to assess the internal structure of the instrument and the discriminant validity of its domains. The original four-domain model was further compared with alternative measurement models.

The research sample consisted of 111 adults recovering from alcohol addiction who had stabilized their addiction for at least 30 days. The choice of the same inclusion criteria as in the original study allowed for a direct comparison of the results, but at the same time meant a limitation in the form of the absence of verification of the tool for other types of addiction (Plíhal, 2025). Although this sample size was sufficient for the planned psychometric analyses, it remains relatively small and should therefore be acknowledged as a limitation. The relatively small sample reflects the high specificity of the target population and the significant challenges associated with reaching and recruiting individuals in the recovery process. Another limitation is that participants self-identified as in recovery and we were not able externally confirm this; however, use of self-identification is increasingly common in recovery research using online platforms and is a useful strategy for recruiting heterogeneous samples, inclusive of those in natural recovery (Gilbert et al., 2024; Kelly et al., 2017). Furthermore, respondents were primarily recruited through online recovery-focused communities and collaborating organizations involved in treatment and recovery, which may have led to selection bias. Individuals actively involved in recovery-focused networks may differ systematically from those who are recovering without formal support or peer support, which could potentially limit the representativeness of the sample.

A comparison of sociodemographic characteristics with the original study by Bowen et al. (2023) shows that the populations are comparable in terms of age and gender. However, they differ in terms of recovery duration, with Czech participants more often in the early stages of recovery. Unlike the study by Bowen et al. (2023), we did not investigate certain characteristics of the respondents, such as income level, severity of addiction, or current alcohol consumption. These methodological variations may have contributed to divergent psychometric results, including a higher median total score in our research sample. However, socio-cultural differences, such as the availability of health and social services, may also have influenced the disparity between the Czech and American samples. Furthermore, broader cultural differences in the understanding and experience of recovery capital may have influenced the interpretation of some items of the instrument, particularly those related to cultural capital, within the Czech context.

Another important limitation is that the validation was conducted exclusively among individuals recovering from alcohol addiction. This approach was chosen to ensure comparability with the original study. However, this also limits the generalizability of the findings to individuals recovering from other substance use disorders or behavioral addictions. This could serve as a solid foundation for future research projects that might succeed in extending the method to other addiction disorders (such as digital gaming disorder, compulsive pornography use, and others).

Despite these limitations, the Czech version of the MIRC demonstrated sufficient variability in responses, confirming its ability to distinguish between respondents with different levels of recovery capital. The internal consistency of the instrument is strong, with Cronbach's alpha values comparable to those in the original study. The items of the tool achieved acceptable reliability indicators, except for the problematic parameters of one item in the cultural capital domain ("My neighborhood or town feels safe.").

The confirmatory factor analysis did not support the hypothesized four-domain structure of the MIRC. The shortfall in fit did not stem from weaknesses at the item level: the model converged without inadmissible solutions and all factor loadings were significant. Social, human, and cultural capital were strongly interrelated (latent correlations $.91$ – $.97$), whereas physical capital appeared to represent a more distinct domain, tentatively suggesting that a simpler structure separating only physical capital from the remaining items may fit the data equally well. This overlap may partly reflect similarities in item content as well as the conceptual interconnectedness of recovery resources. Indeed, different conceptualizations of recovery capital vary in the number and organization of domains while covering substantially overlapping areas (Bowen & Hennessy, 2025). Given the relatively small sample size, however, this simpler structure should be considered exploratory and requires further investigation. Direct comparison of the factorial structure with the original validation is limited, as confirmatory factor analysis was not performed in the original study (Bowen et al., 2023).

Concurrent validity was assessed by examining the relationship between recovery capital and quality of life. A strong positive correlation was found, consistent with the findings of the original study. This association further supports the construct validity of the Czech version of the MIRC.

Another limitation is the lack of an assessment of test–retest reliability, as the cross-sectional design did not allow repeated administration. Determining test stability across repeated assessments remains an important goal for future studies, particularly given the intended use of the MIRC to monitor recovery over time.

These findings also have important practical implications. The Czech version of the MIRC can support individualized treatment planning, recovery coaching, routine outcome monitoring, and the evaluation of recovery services. More broadly, it may also provide valuable evidence to inform the development and evaluation of recovery-oriented addiction policies in the Czech Republic. Future research should extend the validation of the Czech version of the MIRC to individuals recovering from other substance use disorders and behavioral addictions, as well as examine its longitudinal stability, including test–retest reliability, to further strengthen the evidence base and broaden the applicability of the instrument across diverse recovery populations.

5 CONCLUSIONS

As part of this project, the MIRC was adapted into the Czech language, and its psychometric properties were evaluated. The Czech version demonstrated high internal consistency and a strong positive association between recovery capital and quality of life. However, the results did not fully support the original four-domain structure of the instrument, with substantial overlap observed among the social, human, and cultural capital domains. Although further longitudinal research is necessary, the Czech version of the MIRC shows promise for use in clinical and community practice to measure recovery capital in Czech individuals in the recovery process. Another significant contribution of this project is the development of an online application with a Czech version of the inventory. Available to the public at <https://www.vyzkum.org/mirc/index.php>, the application provides users with immediate feedback on their current recovery capital score.

Ethics approval and consent to participate

The study was not reviewed or approved by an ethics committee or institutional review board. The authors considered formal approval not to be required because the study consisted of a voluntary, anonymous online questionnaire survey of adults (aged 18 years or older), in which no personally identifiable information was collected, supplemented by cognitive interviews with six recovery coaches focused solely on the comprehensibility of the translated inventory items. No institution, ethics committee, or other review body issued a formal determination on this matter. The study was conducted in accordance with the ethical principles of Palacký University Olomouc. Informed consent to participate was obtained from all participants, as described below.

Informed consent

Participants in the online survey, including respondents recruited through the Inboox respondent panel, took part anonymously. They were informed about the purpose of the study on the introductory page of the web application and provided electronic informed consent on its final page before submitting their responses. The six recovery coaches who participated in the cognitive interviews gave oral informed consent to participate. No quotations from participants are reported in the article.

Consent for publication

Not applicable

Data availability

The dataset supporting the findings of this study is available from Dominik Plíhal (dominik.plihal01@upol.cz) upon request.

Funding

The funding for the research paper was provided by the Czech Ministry of Education, Youth and Sports for specific research (IGA_FF_2024_016).

Competing interests

Elizabeth Bowen is a co-developer of the original Multidimensional Inventory of Recovery Capital (MIRC) and was consulted on its use, translation, and item interpretation in the Czech adaptation. She also edited the text. The authors declare that they have no other financial or non-financial competing interests.

Authors' contributions

Štěpán Komrská – corresponding author, supervised research project, provided grant support for the project, wrote parts of the text, has drafted the article and revised it.

Dominik Plíhal – planned and organized the implementation of the research project, collected the data, ensured translation of the method, wrote parts of text, provided the statistical analysis.

Elizabeth Bowen – developed the original MIRC measure and consulted on MIRC translation and item interpretation, edited text.

All authors reviewed and approved the final version of the manuscript.

Declaration of generative AI and AI-assisted technologies

During the preparation of this manuscript, the authors used ChatGPT-5.2 Instant (OpenAI) to improve readability, language, and the formulation of results. Claude Opus 5 (Anthropic) and GPT-5.6 Luna (OpenAI) were consulted regarding the procedures and reporting of selected statistical analyses, and Claude Opus 5 (Anthropic) was used to assist in generating R code. All AI-assisted content and code were reviewed and verified by the authors, who take full responsibility for the analyses, interpretation, and final content of the manuscript.

Trial, study, or review registration

Not applicable.

Acknowledgements

The authors thank Klub Absolvent & Recovery koučové for their participation in the preparation of the Czech version of the instrument, and the Department of Psychology, Faculty of Arts, Palacký University Olomouc, for supporting the research activities.

REFERENCES

- Arndt, S., Sahker, E., & Hedden, S. (2017). Does the Assessment of Recovery Capital scale reflect a single or multiple domains? *Journal of Substance Abuse Treatment*, 77, 39–43. doi.org
- Ashford, R. D., Brown, A. M., Brown, T., Callis, J., Cleveland, H. H., Eisenhart, E., Groover, H., Hayes, N., Johnston, T., Kimball, T., Manteuffel, B., McDaniel, J., Montgomery, L., Phillips, S., Polacek, M., Statman, M., & Whitney, J. (2019). Defining and operationalizing the phenomena of recovery: A working definition from the recovery science research collaborative. *Addiction Research & Theory*, 27(3), 179–188. <https://doi.org/10.1080/16066359.2018.1515352>
- Best, D., & Hennessy, E. (Eds.). (2025). *The handbook of recovery capital: Understanding the science and practice*. Bristol University Press. <https://books.google.cz/books?id=UXwZEQAQBAJ>
- Best, D., Vanderplasschen, W., & Nisic, M. (2020). Measuring capital in active addiction and recovery: The development of the Strengths and Barriers Recovery Scale (SABRS). *Substance Abuse: Research and Treatment*, 14, 1–8. doi.org
- Bourdieu, P. (1986). The forms of capital. In J. G. Richardson (Ed.), *Handbook of theory and research for the sociology of education* (pp. 241–258). Greenwood.
- Bowen, E., & Hennessy, E. A. (2025). Conceptualizing recovery capital: Domains and critical perspectives. In D. Best & E. Hennessy (Eds.), *The handbook of recovery capital: Understanding the science and practice* (pp. 113–128). Bristol University Press. <https://doi.org/10.56687/9781529240306-009>
- Bowen, E. A., Scott, C. F., Irish, A., & Nochajski, T. H. (2020). Psychometric properties of the Assessment of Recovery Capital (ARC) instrument in a diverse low-income sample. *Substance Use & Misuse*, 55(1), 108–118. <https://doi.org/10.1080/10826084.2019.1657148>
- Bowen, E., Irish, A., Wilding, G., LaBarre, C., Capozziello, N., Nochajski, T., Granfield, R., & Kaskutas, L. A. (2023). Development and psychometric properties of the Multidimensional Inventory of Recovery Capital (MIRC). *Drug and Alcohol Dependence*, 247, Article 109875. doi.org
- Bunaciu, A., Bliuc, A.-M., Best, D., Hennessy, E. A., Belanger, M. J., & Benwell, C. S. Y. (2024). Measuring recovery capital for people recovering from alcohol and drug addiction: A systematic review. *Addiction Research & Theory*, 32(3), 225–236. <https://doi.org/10.1080/16066359.2023.2245323>
- Burns, J. (2012). *Measuring recovery capital and determining its relationship to addiction problem severity in a treatment seeking population* [Doctoral dissertation, University of the West of Scotland]. UWS Research Repository.
- Cano, I., Best, D., Edwards, M., & Lehman, J. (2017). Recovery capital pathways: Modelling the components of recovery wellbeing. *Drug and Alcohol Dependence*, 181, 11–19. doi.org
- Cloud, W., & Granfield, R. (2008). Conceptualizing recovery capital: Expansion of a theoretical construct. *Substance Use & Misuse*, 43(12–13), 1971–1986. <https://doi.org/10.1080/10826080802289762>
- Dragomirecká, E., & Bartoňová, J. (2006). *WHOQOL-BREF. WHOQOL-100. Příručka pro uživatele české verze dotazníků kvality života Světové zdravotnické organizace*. Psychiatrické centrum Praha.
- Frank, L. E., & Nagel, S. K. (2017). Addiction and moralization: The role of the underlying model of addiction. *Neuroethics*, 10(1), 129–139. <https://doi.org/10.1007/s12152-017-9307-x>
- Gilbert, P. A., Soweid, L., Evans, S., Brown, G. D., Skinstad, A. H., & Zemore, S. E. (2024). How recovery definitions vary by service use pathway: Findings from a national survey of adults. *Psychology of Addictive Behaviors*, 38(8), 891–900. <https://doi.org/10.1037/adb0001026>
- Government of the Czech Republic. (2019). *National strategy for the prevention and reduction of harm associated with addictive behaviour 2019–2027*. Retrieved September 8, 2025, from https://www.drogy-info.cz/data/obj_files/33160/879/Narodni_strategie_2019-2027_fin.pdf
- Granfield, R., & Cloud, W. (1999). *Coming clean: Overcoming addiction without treatment*. NYU Press.
- Green, S. B., & Yang, Y. (2009). Reliability of summed item scores using structural equation modeling: An alternative to coefficient alpha. *Psychometrika*, 74(1), 155–167. <https://doi.org/10.1007/s11336-008-9099-3>
- Groshkova, T., Best, D., & White, W. (2013). The Assessment of Recovery Capital: Properties and psychometrics of a measure of addiction recovery strengths. *Drug and Alcohol Review*, 32(2), 187–194. doi.org
- Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, 43(1), 115–135. <https://doi.org/10.1007/s11747-014-0403-8>
- Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, 6(1), 1–55. <https://doi.org/10.1080/10705519909540118>
- Jorgensen, T. D., Pornprasertmanit, S., Schoemann, A. M., & Rosseel, Y. (2022). *semTools: Useful tools for structural equation modeling* (Version 0.5-6) [Computer software]. <https://CRAN.R-project.org/package=semTools>
- Kelly, J. F., Bergman, B. G., Hoepfner, B. B., Vilsaint, C., & White, W. L. (2017). Prevalence and pathways of recovery from drug and alcohol problems in the United States population: Implications for practice, research, and policy. *Drug and Alcohol Dependence*, 181, 162–169. <https://doi.org/10.1016/j.drugalcdep.2017.09.028>
- Krentzman, A. R., & Gass, J. C. (2025). ‘I like checking in on myself’: Control group experiences in a strengths-based addiction recovery study, with implications for self-monitoring and measurement reactivity. *Qualitative Social Work*, 24(6), 654–678. <https://doi.org/10.1177/14733250241262347>
- National Monitoring Centre for Drugs and Addiction. (2023). *Overview of the situation: Current situation and main trends in addictive behavior in the Czech Republic*. Office of the Government of the Czech Republic. <https://www.drogy-info.cz/en/publications/professional-publications/drug-policy-strategy/current-overview-of-the-situation-in-the-field-of-addiction-among-children-and-adolescents-in-the-czech-republic-2023/>
- Patton, D., Best, D., & Brown, L. (2022). Overcoming the pains of recovery: The management of negative recovery capital during addiction recovery pathways. *Addiction Research & Theory*, 30(5), 340–350. <https://doi.org/10.1080/16066359.2022.2039912>
- Plíhal, D. (2025). *Adaptation of the MIRC tool for the Czech environment* [Bachelor’s thesis, Palacký University Olomouc]. https://library.upol.cz/arl-upol/cs/detail-upol_us_cat-0433245-Adaptace-nastroje-MIRC-do-ceskeho-prostredi/?disprec=1&iset=1
- Rosseel, Y. (2012). lavaan: An R package for structural equation modeling. *Journal of Statistical Software*, 48(2), 1–36. <https://doi.org/10.18637/jss.v048.i02>
- Satorra, A. (2000). Scaled and adjusted restricted tests in multi-sample analysis of moment structures. In R. D. H. Heijmans, D. S. G. Pollock, & A. Satorra (Eds.), *Innovations in multivariate statistical analysis: A Festschrift for Heinz Neudecker* (pp. 233–247). Kluwer Academic Publishers.

Sobell, L. C., Ellingstad, T. P., & Sobell, M. B. (2000). Natural recovery from alcohol and drug problems: Methodological review of the research with suggestions for future directions. *Addiction*, 95(5), 749–764. doi.org

Substance Abuse and Mental Health Services Administration. (2012). *SAMHSA's working definition of recovery*. U.S. Department of Health and Human Services. <https://store.samhsa.gov/sites/default/files/pep12-recdef.pdf>

Vilsaint, C. L., Kelly, J. F., Bergman, B. G., Groshkova, T., Best, D., & White, W. (2017). Development and validation of a Brief Assessment of Recovery Capital (BARC-10) for alcohol and drug use disorder. *Drug and Alcohol Dependence*, 177, 71–76. doi.org

Volkow, N. D., & Blanco, C. (2023). Substance use disorders: A comprehensive update of classification, epidemiology, neurobiology, clinical aspects, treatment and prevention. *World Psychiatry*, 22(2), 203–229. <https://doi.org/10.1002/wps.21073>

Witkiewitz, K., Montes, K. S., Schwebel, F. J., & Tucker, J. A. (2020). What is recovery? *Alcohol Research: Current Reviews*, 40(3), Article 01. <https://doi.org/10.35946/arcr.v40.3.01>

World Health Organization. (2019). *International classification of diseases for mortality and morbidity statistics* (11th ed.). <https://icd.who.int/>

Xia, Y., & Yang, Y. (2019). RMSEA, CFI, and TLI in structural equation modeling with ordered categorical data: The story they tell depends on the estimation methods. *Behavior Research Methods*, 51(1), 409–428. <https://doi.org/10.3758/s13428-018-1055-2>

