Exploring recovery: Findings from a six-year evaluation of an American Indian peer recovery support program

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ABSTRACT

Objectives: We aimed to identify correlates of short-term recovery among American Indians who participated in the Transitional Recovery and Culture (TRAC) Program, a Peer Recovery Support (PRS) program. Research aims (*A*s) were *A*1. How do recovery capital resources and indicators of recovery differ between TRAC participants who completed a six-month follow-up and those who did not? *A*2. How much did recovery capital resource measures change between intake and six-month follow-up? *A*3. Which recovery capital resources are associated with balanced recovery?
Methods: We used the medicine wheel evaluation framework. Each concept within the framework – spiritual, emotional, mental, and physical health – was incorporated into a composite recovery outcome variable. TRAC enrolled 422 American Indians from 2014 to 2019 living in Montana and Wyoming. Six-month change was examined among 214 program participants that completed the six-month program.
Results: We observed significant change for the following recovery capital resources: stable housing, being occupied, attending recovery groups, interacting with family and friends, past substance use activity, and self-reported health status. Logistic regression results for balanced short-term recovery showed that improving or maintaining occupation (AOR = 6.73, *p* = 0.0026), interacting with family or friends (AOR = 4.66, *p* = 0.0050), and still receiving services at follow-up (AOR = 2.25, *p* = 0.0487) were associated with significant increased odds of higher balanced short-term recovery scores.
Conclusion: PRS helps American Indian people achieve short-term recovery. Future efforts should focus on how to retain peers in PRS programs, and the recovery capital needed to sustain long-term recovery.

1. Introduction

More than 19.7 million American adults have been diagnosed with a substance use disorder (SUD) (NSDUH, 2018). Alcohol use is the most common SUD and affects 14.5 million American adults, followed by illicit drug use which affects 7.5 million American adults (NSDUH, 2018). Men are more likely to report a SUD than women (9.4 % vs. 5.2 %) and American Indian and Alaska Native (AIAN) people have the highest prevalence of SUD in the US, with SUD impacting 12.8 % of the AIAN population as compared with 5.1 % of the US overall population (NSDUH, 2018). Previous authors report that rates of cannabis user disorder, prescription opioid overdose fatalities, stimulant dependence,

and cigarette smoking are higher among American Indians (AI) than any other group in the US (Ponicki et al., 2018; Calcaterra et al., 2013).

These statistics highlight the need for effective recovery programs for the AIAN population. Peer Recovery Support (PRS) programs are proving to be a key intervention for communities and individuals, as they address the high prevalence of SUD and limited recovery resources. Peer recovery support (coaching) is a non-clinical approach that includes mentoring, education, and support services provided by individuals with the lived experience of recovery to individuals with SUD or co-occurring substance use and mental health disorders (Reif et al., 2014). The PRS approach also recognizes that recovery from SUD is a process that happens over time, rather than a static outcome (Corrigan

et al., 2019). PRS in AIAN populations has the potential to address pragmatic barriers that hinder treatment. Previous researchers report that environmental or systemic barriers, financial constraints, and limited resources and transportation are common among AIANs seeking recovery support (Rieckmann et al., 2012). Others have identified the limited validity of recovery programs and the lack of culturally-specific programs for AIANs seeking support as barriers that hinder treatment (McFarland et al., 2006). People in recovery provide PRS in a variety of community and institutional settings, either as volunteers or paid workers. White (2009) reports that PRS may be more effective than clinical approaches because it supports and strengthens recovery resources through a relationship-building process.

Exploring the processes that lead to recovery is an important first step in developing public health programs and policies that promote recovery. Investigators have identified a range of factors that influence recovery outcomes. One model for conceptualizing these factors is recovery capital. White (2009) describes recovery capital as both the quantity and quality of internal and external resources that can be accessed to either initiate or sustain recovery from alcohol and drug-related problems. Davidson et al. (2010) further define external recovery capital as connecting those seeking recovery to financial, material, and instrumental resources that support their basic needs. Internal recovery capital involves strategies that build hope, motivation, self-efficacy, and problem-solving skills.

Research on recovery and recovery capital in AIAN populations is limited. What is known is that spirituality, addressing trauma and loss, and involvement in traditional activities help support recovery (Spicer, 2001; Skewes and Blume, 2019; Beraldo et al., 2019). Spicer (2001) reported that some Indigenous people feel that mutual support groups lack congruency with their values and beliefs. Skewes and Blume (2019) conducted a qualitative study in Montana among AIs and found that recovery approaches must address historical trauma, grief, and repeated losses because these are primary barriers to recovery. Beraldo et al. (2019) called for spirituality and religiosity in recovery, where spirituality gives meaning and purpose to life (Puchalski, 2003). Stone et al. (2006) report that AIANs' participation in traditional activities and spirituality had positive effects on alcohol cessation. Among non-AIAN populations, research indicates that predictors of recovery are social support, spirituality, life meaning, religiousness, and 12-step affiliation (Laudet et al., 2006). More research is needed to explore the kinds of recovery capital needed to support AIANs in recovery due to their unique history, culture, and traditions.

The purpose of this evaluation is to increase understanding about recovery among AI people involved in a PRS program, the Transitional Recovery and Culture (TRAC) program, which was facilitated in multiple urban and reservation locations in Montana and Wyoming from 2014−2019. This evaluation addresses three aims: *A1*. How do recovery capital resources and indicators of recovery differ between TRAC participants (peers) who completed a six-month follow-up and those who did not? *A2*. How much did recovery capital resource measures change between intake and six-month follow-up? *A3*. Which recovery capital resources are associated with short-term balanced recovery?

2. Methods

The data used in this evaluation were collected from the Transitional Recovery and Culture (TRAC) program facilitated by the Rocky Mountain Tribal Leaders Council. This is the third publication from the TRAC program. In 2015 the TRAC team published a qualitative study on considerations for implementing PRS in AI reservation communities (Kelley et al., 2015). In 2017 the TRAC team published a second study on the impact of PRS on substance use and health with 224 individuals involved in the first three years of the TRAC program (Kelley et al., 2017). Building on TRAC's previous work, this evaluation aimed to identify key factors of successful short-term recovery among AIs who participated in the TRAC program over a six-year period.

Unlike the Substance Abuse and Mental Health Services Administration's (SAMHSA) definition of recovery – "A process of change through which individuals improve their health and wellness, live a self-directed life, and strive to reach their full potential" – TRAC defines recovery as culturally-grounded and holistic. In TRAC, recovery is:

> *A commitment and choice of every 'unique' and 'sacred' individual to make a personal change in their life through self or supported services in response to maintaining a 'holistic' healthy and productive lifestyle. This is ultimately accomplished through a lifestyle that is balanced through mental, physical, social, emotional, and spiritual well-being in harmony with one's chosen culture and identity* (Kelley et al., 2015).

TRAC peer mentors are American Indian, primarily from the Northern Plains Tribes, and adhere to the idea that there are "many paths to recovery" by providing flexible client-driven support. Peer mentors represent diverse background and experiences, and utilize many recovery support strategies to assist their peers, including talking circles, Wellbriety meetings, spiritual gatherings, sweat lodges, physical fitness, housing assistance, food assistance, education and employment assistance, transportation, and spiritual and cultural support (Kelley et al., 2017). Peer mentors obtained quantitative data for each TRAC peer via interviews at intake, and at a six-month follow-up visit, using the Government Performance and Response Act (GPRA) measures. Detailed information about the GPRA measures may be found at https://www.samhsa.gov/grants/gpra-measurement-tools.

Most TRAC peers were AI or did not provide racial information. Because TRAC does not exclude individuals based on AI status, it is possible that some were not AIs but were part of the community – for example, married into a family or tribe.

This analysis tested which aspects of recovery capital are most significant to recovery among peers in the TRAC program. The Medicine Wheel Evaluation Framework was utilized to evaluate the TRAC program in a culturally informed way (Atlantic Council for International Cooperation, 2021). Each construct within the framework – spiritual, emotional, mental, and physical health – was incorporated into a composite recovery outcome variable in order to better capture the TRAC program's holistic, wellness-focused definition of recovery. The concept of balanced short-term recovery emerged from this conceptualization and builds on previous work of the TRAC program, which found that the goal of PRS is to restore balance to key areas of life that have been impacted by substance use.

2.1. Measures

2.1.1. Balanced recovery

Balanced short-term recovery was defined as a composite sum score (possible range = 0–4) comprised of four indicators of change from intake to six-month follow-up, each associated with a component of the Medicine Wheel (see Fig. 1) and calculated using one or more GPRA variables: (1) health status (spiritual health) (GRPA variable HealthStatus), (2) impact of substances on activity (physical health) (GPRA variable ImpactActivity), (3) psychological/emotional impact of substances (emotional health) (GPRA variable PsycholEmotImpact), and (4) days of substance use (mental health) (all substance use days GPRA variables). Health status change was equal to 1 if the peer went from worse to better self-reported health status between intake and follow-up or maintained their health status, and equal to 0 otherwise. Change in the impact of substances on activity was equal to 1 if the peer went from more to less self-reported severity of the impact of substance use on important activities in the past month or maintained the same severity between intake and follow-up, and equal to 0 otherwise. Change in psychological/emotional impact of substances was equal to 1 if the peer went from more to less self-reported severity of the impact of substance use on emotions in the past month or maintained the same severity, and equal to 0 otherwise. Change in days of substance use was equal to 1 if
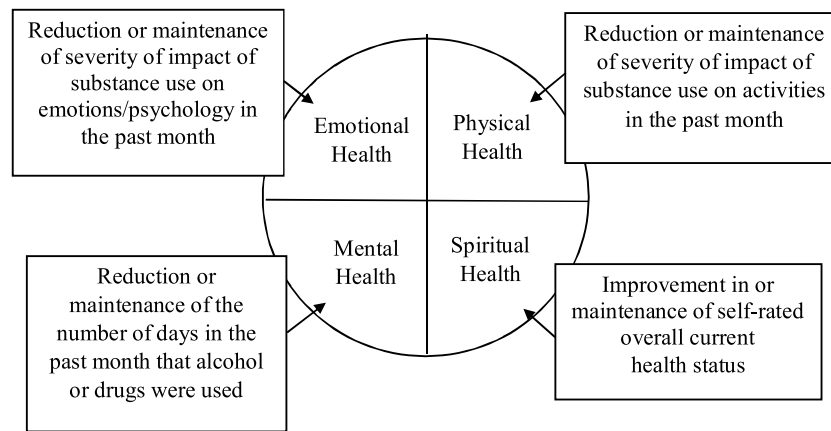
Fig. 1. Combination of the Medicine Wheel Evaluation Framework and GPRA Measures to Create the Balanced Short-Term Recovery Composite (changes in 0-2 components = poorly balanced, changes in 3-4 components = highly balanced).

the peer went from more to fewer days of any substance use in the past month or maintained the same number of substance use days, and equal to 0 otherwise; maintenance was included because 91 of 94 (97 %) peers maintaining their substance use reported 0 days of substance use at intake and 6 months. Substances assessed included alcohol, cocaine, marijuana/hash, heroin, morphine, Dilaudid, Demerol, Percocet, Darvon, codeine, Tylenol, OxyContin/Oxycodone, non-prescription methadone, other hallucinogens, methamphetamines, benzodiazepines, barbiturates, non-prescription GHB, ketamine, other tranquilizers, inhalants, and other illegal drugs.

2.1.2. Recovery factors

Six GPRA-related aspects of recovery capital were binary coded as 1 (improvement/maintenance) versus 0 (worsening) between intake and six-month follow-up visits. Factors included both external and internal recovery capital resources.

External recovery capital resources were operationalized by three indicators: (1) change from not being occupied to being occupied or maintenance of occupation, (2) increase in or maintenance of income, and (3) change from unstable to stable housing or maintenance of stable housing. Change in occupation status was defined as going from no employment and no enrollment in school/job training to some, or maintaining enrollment/employment, as defined by a "yes" response to any of the following: employed full time (35+ hours/week); employed part time; unemployed but engaged in volunteer work; enrolled full or part time in school or a job training program (GPRA variables: EmployStatus and TrainingProgram). Increase in or maintenance of income was determined using a sum of the following GPRA variables: IncomeWages IncomePubAssist, IncomeRetirement, IncomeDisability, IncomeNonLegal, IncomeFamFriends, IncomeOther. Stable housing was defined as a "yes" response to owning or renting an apartment, room, or house, or living in a dormitory/college residence; unstable housing was defined as a "yes" response to living in a shelter, on the street/outdoors, or in an institution; living in someone else's apartment, room, or house; living in a halfway house; living in a residential treatment facility; or "other" (GPRA variables: LivingWhere, LivingHoused).

Internal recovery capital resources were operationalized by the following three indicators: (1) increase/maintenance in attending voluntary self-help groups, (2) increase/maintenance in interaction with supportive friends/family, and (3) continued receipt of TRAC services at six-month follow-up. Change in attendance of voluntary self-help groups was assessed using "yes" responses to the following: attendance at any voluntary self-help recovery groups, attendance at any voluntary non-religious self-help recovery groups, attendance at any voluntary religious self-help recovery groups, and attendance at any other recovery-supporting organizations' self-help groups (GPRA variables:

AttendVoluntary, AttendReligious, AttendOtherOrg). Change in interaction with family/friends who are supportive of recovery was defined as going from no interaction in the past month to some, or maintaining interaction (GPRA variable InteractFamilyFriends). Receipt of services was equal to 1 for peers who were still receiving TRAC services at 6-month follow-up (GPRA variable ReceivingServices).

Covariate measures adjusted for in multivariable analyses included: age (in years), female (1) vs. male (0) sex, any experience of violence or trauma in the past as reported at intake (yes = 1, no = 0), and community location where the TRAC program was administered.

2.2. Data analysis

Descriptive statistics (frequency, percent, mean (M), standard deviation (SD)) were used to describe the sample overall and by completion status at six-month follow-up. Independent t-tests or Wilcoxon rank-sum tests were used to compare completers versus non-completers on continuous measures and Chi-square or Fisher's exact tests for categorical measures at intake. Paired t-tests, Wilcoxon signed-rank tests, McNemar's tests or Bowker's tests of symmetry were used for comparing intake versus six-month follow-up measures for completers. Multivariable logistic regression was performed to analyze high (composite = 3–4) versus low (composite = 0–2) balanced short-term recovery scores by external and internal recovery capital resources while controlling for community location, age, sex, and any violence status. Adjusted odds ratios (AORs) and their 95 % confidence intervals (CIs) were used to quantify effects from modeling. Multicollinearity was assessed with variance inflation factors (VIFs) and all indicated no multicollinearity. Modeling was performed after multiple imputation for missing data using fully conditional specification methods (Berglund and Heeringa, 2014). All analyses were performed in SAS v9.4 (SAS Institute, Cary, NC). A two-sided p-value < 0.05 was considered statistically significant.

3. Results

3.1. Sample description

Table 1 contains summary statistics of TRAC peers. It shows that a total of 422 peers completed the intake data collection; of these, 214 (51 %) completed a six-month follow-up. Overall, 58 % of the sample were female with an average age of 37.6 years (SD = 9.9) and average monthly income of $690 ($SD$=$2984) at intake (see Table 1). Slightly more than half were recruited from the urban #1 community location (54 %), followed by reservation #2 (17 %), urban #2 (16 %), and the remaining three communities (13 %). Seventy percent of the sample reported some past violence or trauma. Past month substance use days

Table 1
Characteristics of the overall sample at intake and by completion status.

Characteristic n (%) or $M \pm SD$	Overall ($N = 422$)	Completed 6-Month Follow-Up ($n = 214$)	Did Not Complete 6-Month Follow-Up ($n = 208$)	P-value
Sex				<0.0001
Male	174 (41)	65 (30)	109 (52)	
Female	246 (58)	147 (69)	99 (48)	
Missing	2 (<1)	2 (<1)	0	
American Indian				N/A
Yes	383 (91)	184 (86)	199 (96)	
Missing	39 (9)	30 (14)	9 (4)	
Age (years)	37.6 ± 9.9	38.0 ± 10.4	37.2 ± 9.2	0.3830
Past Violence/ Trauma				0.1050
No	92 (22)	41 (19)	51 (25)	
Yes	295 (70)	160 (75)	135 (65)	
Missing	35 (8)	13 (6)	22 (11)	
Community Location				<0.0001
Urban #1	228 (54)	112 (52)	116 (56)	
Reservation #1	38 (9)	36 (17)	2 (1)	
Reservation #2	71 (17)	33 (15)	38 (18)	
Reservation #3	2 (<1)	0	2 (1)	
Reservation #4	14 (3)	3 (1)	11 (5)	
Urban #2	68 (16)	29 (14)	39 (19)	
Missing	1 (<1)	1 (<1)	0	
Stable Housing				0.0767
No	306 (73)	162 (76)	144 (69)	
Yes	79 (19)	33 (15)	46 (22)	
Missing	37 (9)	19 (9)	18 (9)	
Occupied (Education, Employment, and/ or Training)				0.7742
No	242 (57)	129 (60)	113 (54)	
Yes	162 (38)	84 (39)	78 (38)	
Missing	18 (4)	1 (<1)	17 (8)	
Monthly Income ($)	$690 ± $2984	$895 ± $4196	$514 ± $1149	0.0075
Attending Recovery Group(s)				0.8472
No	128 (30)	64 (30)	64 (31)	
Yes	294 (70)	150 (70)	144 (69)	
Missing	0	0	0	
Interacting with Family/Friends				0.0581
No	97 (23)	41 (19)	56 (27)	
Yes	325 (77)	173 (81)	152 (73)	
Missing	0	0	0	
Past-Month Substance Use (days)	0.21 ± 0.50	0.19 ± 0.46	0.24 ± 0.53	0.5833
Drug/Alcohol Activity Impact (range = 0−3)	1.0 ± 1.3	1.0 ± 1.3	1.0 ± 1.4	0.8159
Not At All (0)	226 (54)	115 (54)	111 (53)	0.8791
Somewhat (1)	54 (13)	30 (14)	24 (12)	
Considerably (2)	49 (12)	27 (13)	22 (11)	
Extremely (3)	27 (6)	12 (6)	15 (7)	
N/A	36 (9)	19 (9)	17 (8)	
Missing	30 (7)	11 (5)	19 (9)	
Drug/Alcohol Psychological/	2.9 ± 1.3	2.7 ± 1.3	3.0 ± 1.2	0.0408

Table 1 (*continued*)

Characteristic n (%) or $M \pm SD$	Overall ($N = 422$)	Completed 6-Month Follow-Up ($n = 214$)	Did Not Complete 6-Month Follow-Up ($n = 208$)	P-value
Emotional Impact (range = 1−5)				
Not At All (1)	42 (10)	26 (12)	16 (8)	0.0066
Slightly (2)	67 (16)	42 (20)	25 (12)	
Moderately (3)	69 (16)	38 (18)	31 (15)	
Considerably (4)	44 (10)	13 (6)	31 (15)	
Extremely (5)	35 (8)	21 (10)	14 (7)	
Missing	165 (39)	74 (35)	91 (44)	
Self-Rated Health Status (range = 1−5)	3.1 ± 1.1	3.1 ± 1.2	3.1 ± 1.1	0.9476
Excellent (1)	39 (9)	23 (11)	16 (8)	0.7369
Very Good (2)	69 (16)	36 (17)	33 (16)	
Good (3)	134 (32)	69 (32)	65 (31)	
Fair (4)	114 (27)	57 (27)	57 (27)	
Poor (5)	45 (11)	27 (13)	18 (9)	
Missing	21 (5)	2 (1)	19 (9)	

was extremely low (<.24 days) for the overall sample, and among both completers and non-completers.

3.1.1. Completers versus non-completers at intake

Table 1 compares intake data on location, AI status, age, sex, recovery capital resources (external and internal), recovery outcomes, and confounders for those that completed the six-month follow-up versus those who did not in order to answer *A*1. Characteristics that were significantly different between completers and non-completers at intake are: sex (completers 69 % female vs. not 48 %; $p < 0.0001$), location (completers urban #1 52 % vs. not 56 %; $p < 0.0001$), income (completers $M = \$895$ vs. not $M = \$514$; $p = 0.0075$), and psychological/emotional impact of substances (completers 2.7 ± 1.3 vs. not 3.0 ± 1.2; $p = 0.0408$).

3.1.2. Change among completers

Table 2 contains summary statistics for *A*2, which compares external and internal recovery capital resources and balanced recovery components between intake and six-month follow-up for those completing follow-up. Significant differences among completers between intake and six-month follow-up were found in: stable housing (intake 15 % vs. follow-up 26 %; $p = 0.0010$), being occupied with school, work, or training (intake 39 % vs. follow-up 42 %; $p = 0.0075$), attending recovery groups (intake 70 % vs. follow-up 60 %; $p = 0.0277$), interacting with family/friends (intake 81 % vs. follow-up 68 %; $p = 0.0028$), past month substance use (intake $M = 0.19$ vs. follow-up $M = 0.10$; $p = 0.0085$), impact on activity (intake 13 % considerably vs. follow-up 6%; $p < 0.0001$), psychological/emotional impact (intake 18 % considerably vs. follow-up 10 %; $p = 0.0009$), and self-rated health status (intake 13 % poor vs. follow-up 6%; $p < 0.0001$).

3.1.3. Recovery

Table 3 shows results from the multivariable logistic regression of high (composite = 3–4) versus low (composite = 0–2) balanced short-term recovery scores after multiple imputation for missing data. Ninety-two peers had high balanced short-term recovery scores and 122 peers had low balanced short-term recovery scores. Improving or maintaining occupation (AOR = 6.73, $p = 0.0026$), interacting with family or friends (AOR = 4.66, $p = 0.0050$), and still receiving services at follow-up (AOR = 2.25, $p = 0.0487$) were associated with significant increased odds of a high balanced short-term recovery score among those who stayed in the program.

Table 2
Change in characteristics of participants who completed a 6-month follow-up (n = 214).

Characteristic n (%) or $M \pm SD$	At Intake	At 6-Month Follow-Up	P-value
Stable Housing			0.0010
No	162 (76)	93 (43)	
Yes	33 (15)	56 (26)	
Missing	19 (9)	65 (30)	
Occupied (Education, Employment, and/or Training)			0.0075
No	129 (60)	72 (34)	
Yes	84 (39)	89 (42)	
Missing	1 (<1)	53 (25)	
Monthly Income ($)	$889 ± $4184	$4531 ± $48,624	0.2946
Attending Recovery Group(s)			0.0277
No	64 (30)	85 (40)	
Yes	150 (70)	129 (60)	
Interacting with Family/Friends			0.0023
No	41 (19)	69 (32)	
Yes	173 (81)	145 (68)	
Receiving Services At Follow-Up			N/A
No	N/A	119 (56)	
Yes		95 (44)	
Past-Month Substance Use (days)	0.19 ± 0.46	0.10 ± 0.29	0.0085
Drug/Alcohol Activity Impact (range = 0−3)	1.0 ± 1.3	0.6 ± 1.2	0.0396
Not at All (0)	115 (54)	112 (52)	<0.0001
Somewhat (1)	30 (14)	17 (8)	
Considerably (2)	27 (13)	13 (6)	
Extremely (3)	12 (6)	7 (3)	
N/A	19 (9)	9 (4)	
Missing	11 (5)	56 (26)	
Drug/Alcohol Psychological/ Emotional Impact (range = 1−5)	2.7 ± 1.3	2.7 ± 1.2	0.9129
Not at All (1)	26 (12)	15 (7)	0.2447
Slightly (2)	42 (20)	26 (12)	
Moderately (3)	38 (18)	21 (10)	
Considerably (4)	13 (6)	15 (7)	
Extremely (5)	21 (10)	8 (4)	
Missing	74 (35)	129 (60)	
Self-Rated Health Status (range = 1−5)	3.1 ± 1.2	3.0 ± 1.1	0.6036
Excellent (1)	23 (11)	15 (7)	0.2485
Very Good (2)	36 (17)	39 (18)	
Good (3)	69 (32)	41 (19)	
Fair (4)	57 (27)	51 (24)	
Poor (5)	27 (13)	12 (6)	
Missing	2 (<1)	56 (26)	
Recovery Composite Score			N/A
0	N/A	2 (<1)	
1		13 (6)	
2		107 (50)	
3		71 (33)	
4		21 (10)	

Table 3
Multivariable logistic regression modeling of highly balanced vs. poorly balanced short-term recovery (n = 214)*.

Predictor	AOR	95 % CI for AOR	P-value
Intercept	0.04	0.01, 0.29	–
External recovery capital			
Occupied change	6.73	1.97, 23.0	0.0026
Income change	0.76	0.35, 1.65	0.4819
Stable housing change	0.40	0.17, 0.93	0.0337
Internal recovery capital			
Change in recovery group attendance	1.96	0.77, 4.95	0.1546
Change in interaction with family/friends	4.66	1.60, 13.6	0.0050
Receiving services at follow-up	2.25	1.00, 5.04	0.0487
Covariates			
Age (years)	0.96	0.93, 1.00	0.0615
Sex: Female vs. Male	1.73	0.78, 3.82	0.1730
Any Violence (yes)	1.66	0.63, 4.36	0.2989
Location: Urban #1 vs. Others	2.35	0.97, 5.67	0.0573

An AOR > 1 indicates increased odds of higher short-term balanced recovery. Changes in External and Internal recovery capital indicate positive change or maintenance from intake to six-month follow-up.
* *Note.* Pooled results after 1000 imputations using multiple imputation for missing data.

4. Discussion

This is the first evaluation of a PRS program with AIAN people in recovery. From the sample of 422 individuals enrolled in the TRAC program from 2014 to 2019, we found that several external and internal recovery capital resources were associated with high balanced short-term recovery scores for those who stayed in the program for six months. Our results suggest that when peers have a mix of external and internal recovery capital they may be more likely to achieve a more balanced short-term recovery.

In this evaluation, peers who became occupied with school, work, or training or maintained their occupation had more than 6 times the odds of attaining a high balanced short-term recovery score as compared to those who were not occupied. Although this exact finding has not been published in other studies, it may be related to the concept that when individuals feel their life has meaning they are more likely to understand and be able to cope with difficulties while maintaining short-term recovery (Laudet & White, 2008).

Interactions with family and friends were also associated with high balanced short-term recovery scores. TRAC peers who maintained or increased their interactions with family or friends who were supportive of recovery had more than 4 times the odds of experiencing high balanced short-term recovery scores as compared to those with decreased or no interactions. This is consistent with previous research where general social support from friends was predictive of less substance use (Laudet et al., 2006; Dale et al., 2019). Previous research on family interactions and their role in recovery vary, with many studies showing that family interactions and support are more impactful during childhood (Levitt et al., 1993). Once individuals reach adulthood, they maybe more likely to turn to their peers or other supportive networks for healthy interactions that support their recovery (Levitt et al., 1993). However, AIAN family structures and values may differ from the general population, and future researchers may wish to further examine the relationship between family supports and recovery among AIANs.

We also found that unstable housing is a significant correlate of high balanced short-term recovery scores among TRAC peers, which was unanticipated. This is not consistent with previous evaluations (Kelley et al., 2017; Jason et al., 2006) where sober and supportive housing were found to help individuals maintain their recovery. It may be that the peers' previous living environments included individuals who continued to use substances and therefore posed risks to the peers' own recovery; such complexity is not captured in the GPRA measures. Future studies should re-examine the direction and magnitude of the effects of stable housing, as well as contextual and quality-related factors of that housing, on recovery outcomes.

When peers were still receiving TRAC services at follow-up they had more than twice the odds of having high balanced short-term recovery scores. This finding is similar to previous research that has found that participation in 12-step programs, sober activities, and continued social support helps individuals maintain their recovery (Laudet, Savage, &

Mahmood, 2002; Tonigan et al., 2013). Receiving follow-up services at and beyond the six-month TRAC program visit demonstrates a level of commitment that may sustain longer-term recovery.

Although just outside the range of statistical significance, we found that peers living in an urban location had greater odds of achieving a high balanced short-term recovery score than those on rural reservations. This may be because urban locations provide peers and their families with greater access to resources, including housing, social services, education, treatment, medical facilities, and counseling. In reservation locations these resources are not always available to peers.

Not all recovery capital resources were significantly associated with high balanced short-term recovery scores. Income change and attendance at recovery groups were not statistically significant correlates of balanced recovery in this sample. Nonetheless, other studies suggest that income is linked to life purpose, as individuals that earn an income may feel that their daily activities are more meaningful and are also better able to participate in society (SAMSHA, 2019). Similarly, the role of recovery groups was not significant in this sample but has previously been shown to be an important aspect of recovery because such groups help peers expand and maintain social networks that support recovery. Further investigation into the role of these recovery capital resources among AIANs is therefore merited.

Although 70 % of TRAC peers reported past trauma and violence at intake, this was not a significant correlate with recovery among those who stayed in the program. One possible explanation for this is the high prevalence of trauma among all peers, which may have normalized trauma by reducing variation in the sample.

4.1. Strengths and limitations

Strengths of this evaluation include the use of the Medicine Wheel Evaluation Framework to conceptualize balanced recovery, the high level of community and tribal involvement in the evaluation process, and the relatively large sample size and six-year time period. Limitations of this evaluation include the use of self-report data, the number of non-completers who could have differed from completers, the difficulty of isolating PRS from other peer recovery support services, and the inclusion of a small number of non-AI peers. Specific limitations associated with self-report data include social desirability bias and interviewer bias caused by different interviewers administering the GPRA. In addition, during the six-year TRAC program 49 % of peers did not complete the six-month GPRA. Reasons for non-completion vary from communication and transportation difficulties, incarceration, moving, homelessness, and illness and death. It is possible that these individuals maintained their recovery beyond the six-month period, or had different experiences with recovery capital factors than the completers, but this cannot be ascertained from the available GPRA data. It is also essential to recognize that PRS occurs within a continuum of services, that the types of PRS offered depend on the peer's interests and recovery needs, and that it is not possible to isolate the effects of PRS on recovery from other recovery support provided outside of the TRAC program. The fact that not all TRAC peers identified as AI may make these results less generalizable to other AIs; however, it should be noted that the large majority of the peers did identify as AI. Last, how recovery is conceptualized in this evaluation may not capture all facets of recovery; we were limited by the GPRA data collected and the evaluation and reporting requirements outlined by SAMHSA.

4.2. Conclusions

This analysis of balanced short-term recovery among TRAC program peers represents an important step in improving our understanding of the role of recovery capital in PRS programs for AIAN people. Our approach was strengthened by the engagement of community members in the evaluation process and the use of a culturally appropriate framework that defined recovery as holistic and balanced. Increasing or

maintaining occupation with work or school, increasing or maintaining interactions with supportive family or friends, and continuing to receive PRS at six months were all found to be significantly associated with high balanced short-term recovery scores. Future research should assess additional factors associated with peer retention in PRS programs, consider the ways in which interactions among different recovery capital factors may support or impede balanced recovery, include data from longer time periods to assess recovery sustainability, and examine recovery capital resources among AIAN populations in other regions of the US and among Indigenous groups worldwide.

Contributors

All authors contributed to the development of this manuscript. AK developed the outline and concepts for the article. AK led the evaluation and all aspects of writing this article and results. RS cleaned data and assisted with writing and analysis. TM provided statistical review and wrote sections of the results. RP and LP reviewed the paper for cultural responsiveness and checked for validity against program implementation approaches. All authors have approved the final article.

Data statement

None.

Declaration of Competing Interest

The authors report no declarations of interest.

Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:https://doi.org/10.1016/j.drugalcdep.2021.10 8559.

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