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Community support and youth recovery: the mediating role of peer and parental disapproval

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Introduction: The study examined whether community-level support for substance use disorder (SUD) services was associated with youth recovery status, and whether this relationship was transmitted by peer or parent disapproval of substance use.

Methods: Data were drawn from the 2022 Illinois Youth Survey and county-level metrics from the Recovery Ecosystem Index (REI) mapping project. The analyses focused on four key constructs: how wrong your parents feel it would be for you to use substances (parental disapproval), how wrong your peers feel it would be for you to use substances (peer disapproval), self-reported recovery status (recovery status), and community recovery capital. The latter reflects various community-level indicators, such as recovery meetings and supportive policy environments. Using structural equation modeling, we tested the direct and indirect effects of community recovery capital on recovery status.

Results: Our findings indicated that a stronger community support environment was associated with higher peer and parental disapproval. In turn, peer and parental disapproval predicted a greater likelihood of self-reported recovery. The direct path from the community recovery capital to recovery status was not significant, suggesting that the relationship operates primarily through these mediators. Notably, the indirect effects accounted for approximately 76% of the total effect.

Discussion: Supporting recovery services and a recovery-oriented system of care, may influence the parents and peers closer to youth entering recovery. Future research should extend these models by exploring additional mediators and examining longitudinal patterns to better understand the causal mechanisms at work.

KEYWORDS

structural equation modeling, mediation analysis, adolescent recovery, recovery ecosystem index, RCAM

Introduction

Background and literature review

Adolescence is a developmental stage characterized by heightened vulnerability to substance use and its consequences (1). Early substance use is strongly linked to an increased risk of developing substance use disorders (SUDs) in adulthood (2, 3) and experiencing adverse family, social, and legal outcomes (4–6), making early intervention and long-term recovery support essential. While much of the research on

recovery has focused on adults, adolescent recovery is fundamentally different, influenced by developmental transitions, social networks, and structural supports (7). Unlike adults, who often self-initiate treatment and cultivate independent recovery networks, adolescents rely more on family, peer groups, and school-based recovery supports (8).

Despite these distinctions, adolescent recovery remains under-theorized and empirically underexamined, particularly regarding how structural and community-level factors influence recovery trajectories. Prior research has primarily focused on individual and social support factors, often treating community support as a static rather than a dynamic, interactive force in adolescent recovery. This study employs an ecological perspective, integrating individual, family, and community-level influences to inform developmentally appropriate recovery interventions and policies.

Recovery capital as a theoretical framework

Recovery capital (RC) refers to the total resources individuals have access to in order to initiate and sustain recovery from substance use disorders (SUDs) (7, 9). Originally conceptualized among adult populations, the RC framework categorizes resources into four domains: human capital (individual traits such as mental health and coping skills), social capital (relationships and social networks), community capital (environmental and community support), and financial capital (economic and practical resources) (9, 10). Hennessy, Cristello, and Kelly (7) extended this model specifically to adolescent populations, proposing the Recovery Capital for Adolescents Model (RCAM), emphasizing that youth recovery is uniquely shaped by family structures, peer influences, educational environments, and community resources.

Research increasingly supports the application of RC to adolescents. Hennessy et al. (7) conducted qualitative analyses, revealing that adolescent recovery narratives emphasized coping skill development, self-efficacy, and family relationships as key facilitators of recovery. Jurinsky et al. (11) found that adolescent social networks play a multifaceted role in recovery, with the social component of RC intertwined with other domains. Similarly, Tanner-Smith et al. (12) found that adolescents with higher RC were more likely to enroll in recovery high schools (RHSs), leading to improved long-term recovery outcomes.

Despite these distinctions, adolescent recovery remains under-theorized and empirically underexamined, particularly regarding how structural and community-level factors influence recovery trajectories. Prior research has primarily focused on individual and social support factors, often treating community support as a static rather than a dynamic, interactive force in adolescent recovery. However, emerging research on community-based treatment services, such as family-based therapy and the Adolescent Community Reinforcement Approach (A-CRA), illustrates how these interventions actively engage community resources as a dynamic component of recovery, offering a more integrated approach to addressing this gap (Steele et al., 2020; Winters et al., 2020). Drawing on these findings, this study

adopts an ecological perspective to further explore how individual, family, and community-level influences interact, with the goal of informing developmentally appropriate recovery interventions and policies.

Integration with the REI mapping project

To advance beyond individual-level analyses, researchers are increasingly using geospatial tools to examine community-level recovery capital (13–15). For example, the Recovery Ecosystem Index (REI) Mapping Tool (16, 17) provides a county-level assessment of recovery-supportive environments. The REI is publicly available and includes data collected through the Center for Disease Control, the US Census, and the Prescription Drug Abuse Policy System for each county in the United States. The REI provides a numeric score ranging from 1 to 5 that represents the overall strength of a county's recovery ecosystem. The REI is calculated using 14 indicators within 3 component classes: substance use disorder treatment; continuum of substance use disorder support; and infrastructure and social. Each component class also ranges from 1 to 5. The indicators may include recovery support services such as recovery housing, recovery community-organizations, mutual-aid societies [e.g., Alcoholics Anonymous (AA), Narcotics Anonymous (NA), SMART Recovery], and specialty substance use treatment and policies like required insurance coverage of medications for opioid use disorder, Good Samaritan laws, and laws that allow syringe service programs (16). While the RC framework identifies community capital as a critical factor for sustained recovery, the REI Mapping Tool provides an empirical method for measuring this construct at the county level. Developed in collaboration with the Fletcher Group, NORC at the University of Chicago, and East Tennessee State University (ETSU), the REI offers a standardized measure of community recovery capital across geographic regions, helping to identify disparities and guide policy interventions in underserved areas. By incorporating community-level data, the REI moves beyond traditional, individual-focused models to assess broader systemic factors shaping adolescent recovery trajectories. This ecological perspective aligns with the RC framework, emphasizing that recovery is not solely an individual effort but is deeply influenced by social and environmental conditions.

Research objectives, research gaps, and research questions

This study addresses a critical gap in adolescent recovery research by examining how individual and community-level factors interact to shape recovery outcomes. Prior research has often isolated parental and peer influences or treated community support as a static indicator, overlooking its dynamic and mediating effects. To bridge this gap, this study links self-reported recovery status from the Illinois Youth Survey (IYS) with county-level recovery metrics from the REI, offering a multi-level ecological perspective on adolescent recovery.

We hypothesize that higher community RC will directly increase the likelihood of adolescents identifying as “in recovery” by improving access to recovery resources and supportive networks. Additionally, community RC will indirectly influence recovery by shaping parental and peer norms around substance use, reinforcing pro-recovery behaviors. By integrating individual and community-level data, this study extends the RC framework by empirically testing how structural and social factors collectively support adolescent recovery. This ecological approach enhances our understanding of how recovery-supportive environments foster long-term recovery and provides actionable insights for policy and intervention aimed at strengthening recovery ecosystems for youth.

Methods

Data and participants

The Illinois Youth Survey (IYS) is a biennial, school-based, in-school, self-report survey of 8th, 10th, and 12th graders across Illinois (18). The statewide sample uses a two-stage stratified cluster design with probability-proportional-to-size selection of schools (stratified by community type and grade levels); within participating schools and design weights with post-stratification are applied to represent Illinois public-school students (19, 20).

This study combined data from the 2022 Illinois Youth Survey (IYS) with county-level metrics from the REI Mapping Tool. The IYS provided individual-level data on substance use behaviors, recovery status, and disapproval of substance use among adolescents. The REI supplied community-level indicators of substance use disorder (SUD) support resources across Illinois counties. In order to ensure data quality, inconsistent responders were excluded based on the IYS honesty validation item.

The analytical sample consisted of 159,375 adolescents from Illinois. Participants ranged in age from 13 to over 19 years, with the majority being 18 years old (28.53%), followed by 17-year-olds (27.83%), 16-year-olds (20.21%), and 15-year-olds (17.7%).

Most participants were enrolled in 11th grade (41.63%), with the remaining distributed among 10th grade (27.27%), 12th grade (19.77%), and 9th grade (11.33%). The gender distribution was relatively balanced, with 48.85% males and 46.91% females. A smaller proportion identified as transgender (1.67%) or reported another gender identity (2.58%). Regarding sexual orientation, most participants identified as heterosexual (76.81%), while others reported being bisexual (9.00%), questioning (4.80%), gay or lesbian (3.03%), or having another self-described identity (3.96%). The racial and ethnic composition was diverse: White (59.65%), Latino/Latina (19.80%), Black/African American (10.25%), Asian American (9.56%), multi-racial (5.13%), other racial categories (3.00%), and Native American (1.73%).

Measures

The primary independent variable was community recovery capital, measured through the Continuum of SUD Support

Score from the REI (17, 21). This score reflected county-level indicators such as proximity to harm reduction services, availability of peer recovery supports, community coalition presence, drug court availability, state policy environment, and social association density. Higher scores on this measure indicated weaker community support for recovery. The Continuum of SUD Support Score was used in place of the overall score to better align with the study’s focus on community-level structures and policies that support SUD recovery beyond formal treatment.

Perceptions about parent and peer disapproval have been shown to influence social capital (22). Perceptions about parental substance use disapproval were assessed through the Parental Disapproval Score from the Illinois Youth Survey, which combined items measuring how much youth perceived their parents would disapprove of them using substances. This measure aggregated six items assessing perceived parental disapproval of alcohol consumption, daily alcohol use, e-cigarette use, tobacco use, marijuana use, and prescription drug misuse. Each item used a 4-point Likert scale, with lower composite scores indicating stronger perceived parental disapproval. Perceptions about peer substance use disapproval were assessed through the Peer Disapproval Score, which combined five parallel items measuring how much youth perceived their peers would disapprove of them using various substances. This measure included items about alcohol use, e-cigarette use, tobacco use, marijuana use, and prescription drug misuse. The same 4-point response scale was maintained, with lower scores reflecting stronger perceived peer disapproval. Youth recovery status was measured through a binary self-report item (recovery status) asking participants whether they considered themselves currently in substance use recovery (coded as 1 = Yes, 2 = No) (23).

Analysis approach

We used structural equation modeling through the Lavaan package in R to test our hypothesized mediation models. We specified separate single-mediator models to examine whether parental and peer disapproval of substance use mediated the relationship between community recovery capital and youth recovery status. For each mediation model, we estimated:

- The path from community recovery capital to the mediator (path a)
- The path from the mediator to recovery status with controls for community recovery capital (path b)
- The direct path from community recovery capital to recovery status with controls for the mediator (path c')
- The indirect effect (product of a and b)
- The total effect (sum of direct and indirect effects)

We specified the mediator and outcome variables as ordered factors in our models. Recovery status was coded as a binary outcome. We estimated the models using maximum likelihood with robust standard errors, which is appropriate for models

with categorical endogenous variables. Although students were nested within schools and 102 counties, and each respondent received their county's REI value, we did not incorporate county/school clustering or survey weights. Because REI varies only at the county level, the REI effect is identified by between-county differences; under standard exogeneity assumptions, unmodeled within-county dependence primarily inflates standard errors/p-values. We therefore interpret statistical significance conservatively. The mediation models were specified as:

1. Mediator $\sim a_1 \times \text{community recovery capital} + \epsilon_M$
2. Recovery status $\sim b_1 \times \text{Mediator} + c_1 \times \text{community recovery capital} + \epsilon_Y$
3. Indirect effect = $a_1 \times b_1$
4. Total effect = $c_1 + (a_1 \times b_1)$

A custom R function iterated over all combinations of independent and mediator variables, extracting parameter estimates including unstandardized and standardized coefficients, standard errors, z-values, and p-values. Data integrity was maintained through several approaches, including filtering out inconsistent responders using the honesty validation item from the Illinois Youth Survey.

Results

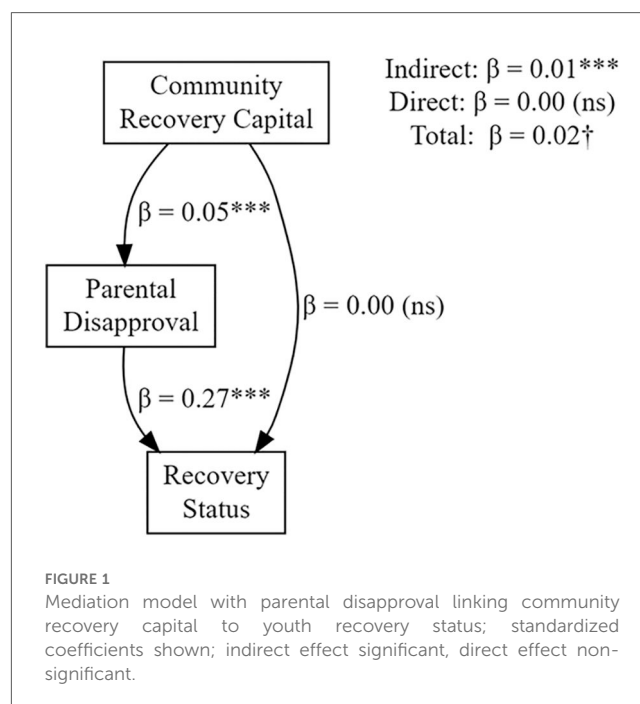
Descriptive statistics

Descriptive statistics were calculated for the key variables in this study. Parental disapproval was predominantly in the low category ($n = 151,677$, 95.17%), with fewer respondents reporting medium ($n = 6,338$, 3.98%) or high scores ($n = 1,360$, 0.85%). This distribution indicates that most adolescents perceived their parents as disapproving of their substance use. Peer disapproval showed more variation, though still primarily fell in the low category ($n = 118,702$, 74.48%), followed by medium ($n = 29,993$, 18.82%) and high ($n = 10,680$, 6.70%). Regarding youth recovery status, most participants did not identify as being in recovery ($n = 151,806$, 95.25%), while a smaller proportion reported being in recovery ($n = 7,569$, 4.75%). Community recovery capital, which reflected county-level recovery resources (with lower scores indicating stronger support), was distributed across three levels: strong support (level 1: $n = 93,764$, 58.91%), moderate support (level 2: $n = 58,562$, 36.80%), and weaker support (level 3: $n = 7,049$, 4.43%).

Mediation analysis results

Parental disapproval

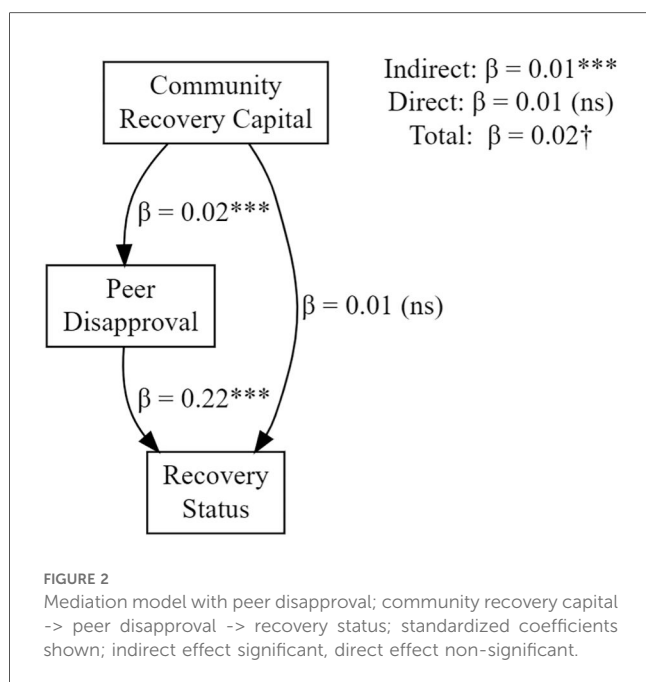
Figure 1 presents results from the mediation analysis with parental disapproval as the mediator. The path from community recovery capital to parental disapproval was positive and statistically significant ($a = 0.05$, $SE = 0.01$, $z = 5.54$, $p < .001$). This result demonstrates that higher levels of community recovery capital predicted stronger parental disapproval. The



path from parental disapproval to youth recovery status was also positive and significant ($b = 0.27$, $SE = 0.01$, $z = 30.13$, $p < .001$). This finding shows that stronger parental disapproval predicted a higher likelihood of youth recovery. The indirect effect of community recovery capital on youth recovery status through parental disapproval was statistically significant ($ab = 0.01$, $SE = 0.00$, $z = 5.45$, $p < .001$). The direct effect was not significant ($c' = 0.00$, $SE = 0.01$, $z = 0.44$, $p = .66$). The total effect was marginally significant ($c = 0.02$, $SE = 0.01$, $z = 1.91$, $p = .06$). These results support full mediation. The effect of community recovery capital on youth recovery status occurred entirely through parental disapproval.

Peer disapproval

Figure 2 presents results from the mediation analysis with peer disapproval as the mediator. The path from community recovery capital to peer disapproval was positive and statistically significant ($a = 0.02$, $SE = 0.01$, $z = 4.37$, $p < .001$). This result shows that higher levels of community recovery capital predicted stronger peer disapproval of substance use. The path from peer disapproval to youth recovery status was also positive and significant ($b = 0.22$, $SE = 0.01$, $z = 35.23$, $p < .001$). This finding demonstrates that stronger peer disapproval about substance use predicted a higher likelihood of youth recovery. The indirect effect of community recovery capital on youth recovery status through peer disapproval was statistically significant ($ab = 0.01$, $SE = 0.00$, $z = 4.33$, $p < .001$). The direct effect was not significant ($c' = 0.01$, $SE = 0.01$, $z = 1.32$, $p = .19$). The total effect was marginally significant ($c = 0.02$, $SE = 0.01$, $z = 1.91$, $p = .06$). These results also support full mediation. The effect of community recovery capital on youth recovery status occurred primarily through peer disapproval.



Comparison of mediating effects

Both mediation models demonstrated statistically significant mediating effects. The standardized indirect effect for the parental disapproval model (standardized $ab = 0.01$) appeared slightly stronger than for the peer disapproval model (standardized $ab = 0.00$). This difference suggests that parental normative beliefs might play a somewhat more influential role in the relationship between community recovery capital and youth recovery status. We caution readers to interpret this difference carefully due to the relatively small magnitude of both indirect effects. In both models, we found a non-significant direct effect paired with a significant indirect effect. This pattern suggests that substance use disapproval fully mediate the relationship between community recovery capital and youth self-reported recovery. The marginally significant total effects ($p = .06$ in both models) indicate that the overall relationship between community recovery capital and recovery status shows a trend toward significance that the mediating pathways through normative beliefs fully account for.

Discussion

This study examines how community recovery capital influences adolescent recovery through perceived parental and peer disapproval. Our findings reveal complex pathways that connect ecological factors with individual recovery outcomes. These results offer important insights into the dynamic processes which underlie adolescent recovery trajectories.

Ecological framework of adolescent recovery

Our results align with and extend the Recovery Capital for Adolescents Model (RCAM) proposed by Hennessy et al. (7).

This model emphasizes that youth recovery receives unique shape from family structures, peer influences, and community resources.

The significant mediation effects we observed support the ecological perspective that adolescent recovery cannot be understood through single-level analyses. It requires examination of multiple interacting systems. Unlike adult recovery, which often relies on self-initiated treatment and independent recovery networks, our findings confirm that adolescent recovery exists embedded within social contexts. In these contexts, parents and peers function as critical conduits for community influence.

Parental disapproval pathway

Our first mediation model revealed that parental disapproval fully mediated the relationship between community recovery capital and youth recovery status. According to Cohen's (24) effect size benchmarks, the path from community recovery capital to parental disapproval ($\beta = 0.03$) represents a very small effect. The path from parental disapproval to youth recovery status ($\beta = 0.27$) constitutes a small-to-medium effect.

The mediation proportion (76%) suggests community support structures primarily affect recovery outcomes through their effect on parental attitudes rather than through direct environmental influences. This finding aligns with Tanner-Smith et al. (12), which emphasized that family support serves as a critical component of adolescent recovery capital. The significant mediation through parental disapproval underscores what Cambron et al. (8) identified as a fundamental difference between adolescent and adult recovery: adolescents' heightened reliance on family structures. Our results provide empirical demonstration of how community-level factors translate through family systems to influence individual recovery outcomes. The positive relationship between community recovery capital and parental disapproval presents an intriguing pattern. In communities with weaker recovery support infrastructures, parental disapproval is lower. This finding warrants careful consideration. One possibility aligns with Hennessy's RCAM framework. It suggests that community resources may shape family attitudes about substance use through multiple pathways. These pathways include educational outreach and visibility of recovery services.

Peer disapproval pathway

Our second model demonstrated that peer disapproval also fully mediates the relationship between community recovery capital and youth recovery status. The standardized effect from community recovery capital to peer disapproval is very small ($\beta = 0.01$). The effect from peer disapproval to youth recovery status approaches a medium effect ($\beta = 0.22$). The mediation proportion (31%) indicates peer disapproval constitutes a secondary but meaningful channel for community support effects. This finding supports Jurinsky et al.'s (11) assertion that adolescent social networks play

County Recovery Ecosystem Index (Illinois, 2022)

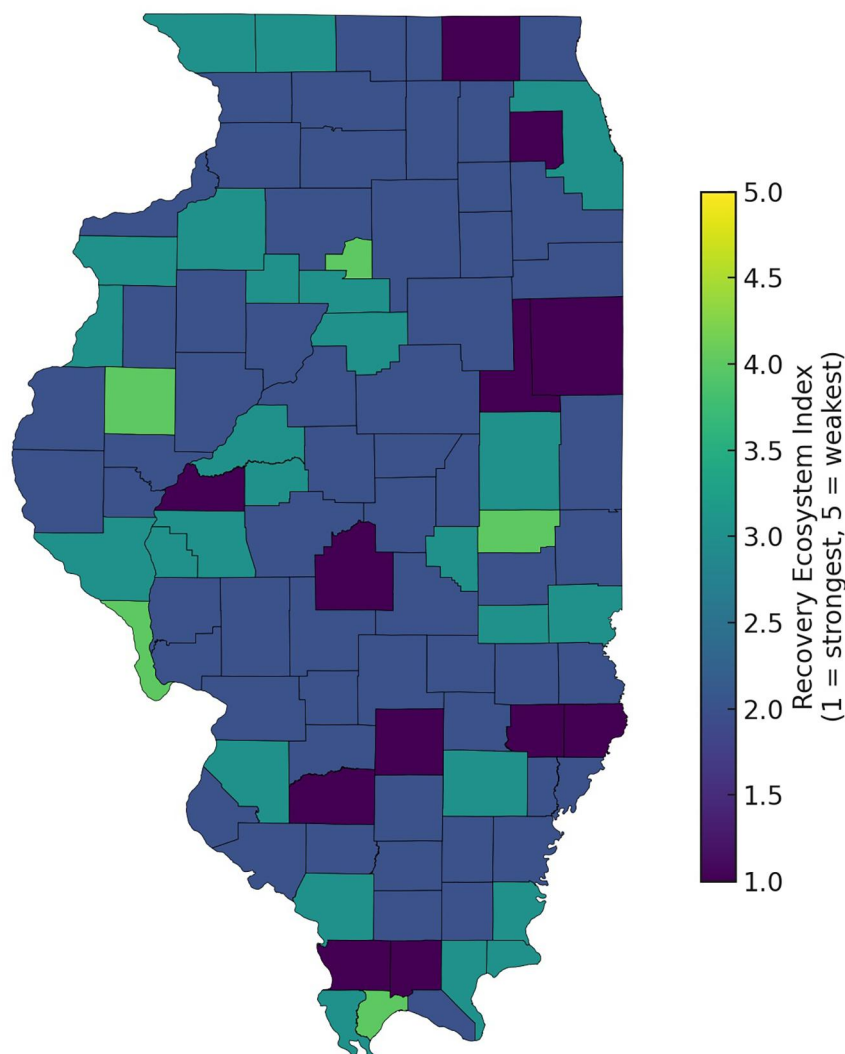


FIGURE 3
County Recovery Ecosystem Index (Illinois, 2022): choropleth map (scale 1 = strongest to 5 = weakest).

a multifaceted role in recovery. Peer influences serve as critical components of youth recovery capital. The significant peer mediation pathway aligns with SAMHSA's (25) recognition that adolescence represents a developmental period of heightened vulnerability to social influences about substance use. The peer pathway is empirically supported by Cambron et al.'s (8) observation that adolescents rely heavily on peer group supports in their recovery process (31). The smaller influence of community factors on peer disapproval (compared to parental disapproval) may reflect the expansion of adolescent social networks beyond immediate geographic boundaries. Adolescents form connections across multiple contexts such as school, extracurricular activities, and online platforms (33). Their peer norms may thus become less tethered to local community characteristics. This interpretation aligns with developmental

perspectives that highlight increased autonomy from immediate community contexts during adolescence (26).

Non-significant direct effects: insights from recovery ecosystem perspective

The absence of significant direct effects from community recovery capital to youth recovery status challenges assumptions about direct environmental influences on individual outcomes. This finding has important theoretical implications when we consider it through the lens of the REI Mapping Tool framework (A county-level choropleth of the 2022 Recovery Ecosystem Index for Illinois is shown in Figure 3.) (27). The REI measures critical community-level recovery resources

such as harm reduction services, peer recovery supports, community coalitions, drug courts, and policy environment. Our findings suggest these resources primarily influence adolescent recovery through their impact on proximal social environments rather than through direct mechanisms. This pattern aligns with Cloud and Granfield's (9) conceptualization of recovery capital as a system that operates across multiple interacting domains. Our results provide empirical demonstration that community capital operates through social capital (beliefs of parents and peers) to influence individual recovery outcomes. This finding supports Best et al.'s (28) emphasis on the interactive nature of recovery support systems across ecological levels. The full mediation through disapproval suggests that community interventions must explicitly target adolescents' proximal social networks to achieve clinical impact on identifying SUD problems and youth in recovery (29). This interpretation holds particular importance for adolescent populations. As Hennessy et al. (7) highlighted, these youth navigate recovery within social contexts that differ fundamentally from adult recovery pathways.

Alternative explanations and bidirectional relationships

The cross-sectional nature of our data allows several alternative explanations. The relationships we observed may reflect complex bidirectional processes consistent with Ohannessian et al.'s (2) findings on developmental pathways to substance use outcomes. First, the observed relationships may reflect reverse causality. Parents and peers of adolescents already in recovery may develop stronger anti-substance use attitudes as a consequence rather than a cause of the recovery process. Supporting someone in recovery could strengthen their disapproval of that recovering youth's future substance use. This effect might appear especially in communities with limited recovery support resources where families must compensate for systemic gaps. Second, the mediating role of disapproval may face confoundment by unmeasured variables. Treatment engagement itself could simultaneously influence both others' disapproval of one's use and one's recovery status. That is, youth who participate in treatment programs often encounter recovery-focused messages and are told to add pro-recovery peers to their networks. Such messages may alter their actual peer networks, increasing those that disapprove of their use, and change their own recovery identification. The same mechanism could be operating on parental disapproval if parents are taught the importance of setting clear expectations on substance use with their recovering child. Third, school-based recovery supports may function as unmeasured mediators in our observed relationships. Cambron et al. (8) highlighted these supports as particularly important for adolescents. Recovery high schools and school-based counseling programs could simultaneously influence both peer disapproval and identifying as being in recovery. This dual influence might explain some of the relationships we observed.

Additional implications

Our findings suggest important implications for adolescent recovery interventions and policy development. First, full mediation through disapproval shows that community interventions impact networks more proximal to adolescents, their peers and parents, rather than the adolescent directly. It is well known that peers and parents are critical components of adolescent recovery capital (11, 12, 32). Thus, supporting community level recovery resources, even when they are notably adult-centric, has indirect benefits to adolescents. However, developing more adolescent-focused community recovery capital may further increase the number of youth identifying as being in recovery. Indeed, because community recovery capital here was based on opioid and adult-centric indicators, it possibly explains the weak paths to mediators and lack of direct effects on adolescent recovery.

Our results partially support the utility of the REI (27) as a framework for measuring community recovery capital. However, our findings suggest that the REI should receive supplementation with metrics that specifically address youth recovery ecosystems. These should include school-based recovery supports and family-focused services. Policies that incentivize coordination between adult and youth SUD services may prove particularly effective. This effectiveness stems from the significant influence of social contexts on adolescent recovery outcomes.

Limitations and future directions

Several limitations warrant acknowledgment. First, our cross-sectional design precludes causal inferences about mediation pathways. Longitudinal studies could clarify whether changes in community recovery capital precede shifts in disapproval or vice versa. This would address potential reverse causality concerns. Second, our community-level measure was derived from the 2023 REI Map. This project primarily reflects adult-focused recovery infrastructure. As Hennessy et al. (7) emphasize, adolescent recovery capital differs fundamentally from adult recovery capital. Future research should develop and validate measures of community recovery capital that specifically address adolescent needs and resources. For example, an adolescent ecosystem index could include young people mutual-aid meetings, adolescent drug court presence, and developmentally informed substance use policies. Furthermore, the REI includes several opioid-specific or related indicators (e.g., Medicaid coverage for medications for opioid use disorder, distance to prescribers of medications for opioid use disorder). An adolescent index could include alcohol and cannabis specific indicators. The adult and opioid leaning of the REI may explain the absence of direct effects between the continuum of substance use disorder support to peer and parental disapproval. Additional work is needed to create and validate measures of adolescent community recovery capital. Third, our reliance on self-reported recovery status and disapproval introduces potential measurement bias. As Kelly et al. (30) note, adolescent self-assessment of recovery status

may differ substantially from clinical assessments. Future studies should incorporate multiple informants and objective indicators to triangulate findings. Fourth, our study focused on Illinois' youth. Replication in diverse geographic regions would strengthen the generalizability of our findings. The REI Mapping Tool offers an opportunity to extend this research across different regions. This extension could reveal how various policy environments and cultural contexts influence the pathways we identified.

Conclusion

This study advances our understanding of how community recovery capital influences youth recovery status through the mediating mechanisms of parental and peer disapproval of substance use. Our findings highlight the importance of considering adolescent recovery as embedded within multiple social systems. Community factors operate primarily through parental and peer pathways rather than direct mechanisms. The stronger mediation effect through parental disapproval emphasizes the continued importance of family systems in adolescent recovery. The significant peer pathway confirms the role of social networks highlighted in the RCAM framework. By integration of individual-level data from the Illinois Youth Survey with county-level metrics from REI Mapping Tool, our study provides a novel contribution from multiple levels of the ecological perspective, bridging critical gaps in adolescent recovery research. Future research should build upon this approach through longitudinal designs, adolescent-specific measures of community recovery capital, and exploration of additional mediating mechanisms. These efforts will enhance our understanding of the complex pathways that connect community resources to individual recovery outcomes. This understanding will ultimately inform more effective interventions for adolescents in recovery.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving humans were approved by University of Illinois at Urbana-Champaign Institutional Review Board. The studies were conducted in accordance with the local legislation and institutional requirements. Written informed consent for participation in this study was provided by the participants' legal guardians/next of kin. Written informed consent was not obtained from the individual(s) for the publication of any potentially identifiable images or data

included in this article because the study did not involve any new collection of personal data, and all the statistical analyses and data manipulation were conducted on anonymized data.

Author contributions

JK: Methodology, Data curation, Validation, Investigation, Writing – review & editing, Software, Visualization, Formal analysis, Writing – original draft. DS: Resources, Project administration, Conceptualization, Supervision, Writing – review & editing, Funding acquisition. AL: Writing – original draft, Writing – review & editing. CR: Writing – review & editing. JJ: Writing – review & editing.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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