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RESEARCH ARTICLE

Resilience and Adverse Childhood Experiences: Associations With Poor Mental Health Among Homeless Adults

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Introduction: Adverse childhood experiences are known risk factors for a range of social, economic, and health-related outcomes over the life course. Resilience is a known protective factor. This study examines the associations of adverse childhood experiences and resilience with poor mental health outcomes among homeless adults with mental illness.

Methods: This study utilized data from 565 homeless adults with mental illness participating in a Housing First intervention in Toronto (2009–2013) to evaluate their sociodemographic characteristics, adverse childhood experience exposure, resilience, and mental health outcomes. Descriptive statistics were generated, and logistic regression models were used to examine the association of total adverse childhood experience score and resilience with poor mental health outcomes. Analyses were conducted in 2019.

Results: The average total adverse childhood experience score was 4.1 (SD=2.8) among all study participants. Individuals with a lifetime duration of homelessness exceeding 36 months (p=0.011) had higher mean scores. Total score was positively associated with several mental illness diagnoses and psychopathology severity, indicated by co-occurring mental illness diagnoses (AOR=1.23, 95% CI=1.13, 1.33) and high Colorado Symptom Index scores (AOR=1.26, 95% CI=1.14, 1.38). Resilience served as a protective factor against several individual mental illness diagnoses, co-occurring mental illness diagnoses (AOR=0.85, 95% CI=0.76, 0.95), and high Colorado Symptom Index scores (AOR=0.69, 95% CI=0.61, 0.79).

Conclusions: Findings highlight the high prevalence of adverse childhood experiences and their negative impact on homeless adults with mental illness. Resilience protects against adverse childhood experience–associated poor mental health outcomes, thereby serving as a potential interventional target in homeless populations.

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INTRODUCTION

A wealth of existing evidence has revealed strong associations between adverse childhood experiences (ACEs) and social, economic, and health-related outcomes over the life course.[1–3] These ACEs include physical, sexual, and emotional abuse; neglect; and household dysfunction. In the pioneering Centers for Disease Control and Prevention–Kaiser study, adults in a California HMO exposed to ACEs were much more likely to have poor physical, mental, and behavioral

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health outcomes.[4] For mental health, strong associations have been reported between ACEs and mood disorders, personality disorders, suicidality, and other psychiatric disorders.[3,5–7] Several studies and meta-analyses have revealed a dose–response relationship between total ACE score and poor later-life outcomes in the general population.[8–10] For example, adults exposed to 1, 4, and 7 or more ACEs are 1.7, 3.9, and 17.0 times more likely to have attempted suicide than those exposed to no ACEs.[3]

The results of most ACE studies—primarily focused on adults with stable housing and private insurance—cannot be generalized to homeless adults with mental illness.[4,11] This demographic faces a double burden from early adversities; in addition to the association of ACEs with psychopathology severity,[2] ACEs have been linked to increased risk of homelessness through fragmented familial ties, decreased social support, and limitations in education and employment.[12] A few studies have reported associations between childhood adversities and suicidality, substance abuse, depressive symptoms, and psychiatric hospitalization among homeless adults.[13–18]

Studies of individuals at risk for ACE-associated problems have found considerable variability in later-life outcomes.[19,20] Resilience—the capacity to "adapt successfully to challenges that threaten function, survival, or future development"—is one variable that facilitates positive developmental trajectories despite early trauma.[21] Resilience has been found to protect against psychopathology in diverse contexts of trauma.[22,23] To the authors' knowledge, no studies have examined resilience as a protective factor against ACE-associated poor mental health outcomes among homeless adults.

This study investigates whether ACEs serve as risk factors for poor mental health outcomes among homeless adults with mental illness. It also asks whether resilience serves as a protective factor against such outcomes. Altogether, these investigations might inform novel prevention and intervention strategies to enhance resilience capacities and ameliorate the negative impact of early adversities among this vulnerable population.

METHODS

Study Population

The At Home/Chez Soi Project was an RCT of a Housing First intervention for homeless adults with mental illness in 5 Canadian cities.[24] This study examined data from 1 study site (Toronto). Trial details have been reported elsewhere.[25]

The At Home/Chez Soi inclusion criteria were as follows: (1) age ≥18 years, (2) either absolute homelessness or precarious housing, and (3) presence of a serious mental disorder.[25] Serious mental disorders were identified by the DSM-IV criteria in the MINI International Neuropsychiatric Interview 6.0 (MINI).[26] Participants with at least 1 of the following diagnoses were considered eligible for the study: (1) major depressive disorder, (2) manic or hypomanic episode, (3) mood disorder with psychotic features, (4) panic disorder, (5) post-traumatic stress disorder (PTSD), and (6) psychotic disorder. The study was approved by the Research Ethics Board of St. Michael's Hospital in Toronto and was registered with the International Standard RCT Number (ISRCTN42520374).

The study recruited participants through referral from >80 agencies providing services to individuals experiencing homelessness or mental illness. This extensive network included shelters, hospitals, outreach programs, and community health centers. Information related to sociodemographics, housing, health, and resilience were collected using validated questionnaires.[25] The following analyses were based upon data from 565 participants recruited between October 2009 and June 2011. Note that 10 transgender participants were excluded from the analyses as this sample size precluded multivariable analysis. In addition, associations between ACEs and later health outcomes are unique for transgender individuals and would not be captured adequately in these analyses.[27–29]

Measures

Total ACE score was the main risk factor in this study. ACEs were assessed 18 months after the baseline interview using the ACE scale, consisting of questions related to trauma experienced before age 18 years.[4] The ACE scale includes 10 total categories: 3 categories of childhood abuse (emotional, physical, and sexual), 2 categories of neglect (emotional and physical), and 5 categories of household dysfunction (parental separation/divorce, household mental illness, domestic violence against women, household criminal justice involvement, and household substance abuse). Participants received 1 point for a category if they responded *yes* to 1 or more questions in a particular category, for a maximum total score of 10. The ACE scale has good test–retest reliability and retrospective–prospective reporting agreement.[11,30]

Resilience was the main protective factor in this study. The Connor–Davidson Resilience Scale 2, a 2-item scale with possible scores between 0 and 8, was used to measure resilience.[31,32] Higher scores indicated greater resilience.

The following mental health diagnoses were considered outcomes and assessed through the MINI[26]: (1) major depressive disorder, (2) manic or hypomanic episode, (3) PTSD, (4) panic disorder, (5) mood disorder with psychotic features, (6) psychotic disorder, (7) alcohol dependence, (8) substance dependence, (9) alcohol abuse, (10) substance abuse, and (11) suicidality. Response options to the suicidality module included: *no, low, moderate*, or *high*. To assess co-occurrence of mental disorders, an indicator variable was created to capture having 2 or more mental disorders. The Colorado Symptom Index score, measuring severity of self-reported psychiatric symptomology, was also considered as an outcome. It was measured through a 14-item Likert-type scale with possible scores between 0 and 70, with higher scores indicating greater symptom burden.[33] To assess severe psychiatric symptomology, an indicator variable was created to capture a clinically relevant threshold of ≥30 points.[34] Psychometric properties for all psychological measures are reported in Appendix Table 1, available online.

Statistical Analysis

Participants with any missing outcome, exposure, or covariate were deemed to be incomplete case participants. Comparisons of

continuous variables between complete and incomplete case participants were conducted using Student's *t*-tests. Comparisons of categorical variables were conducted using Pearson's chi-square tests or Fisher's exact tests. Descriptive summaries of total ACE scores across all outcomes and covariates were generated.

First, univariate and multivariable logistic regression analyses were used to model the unadjusted and adjusted associations between total ACE score and resilience with mental health outcomes for complete case participants (*n*=373). The following covariates were chosen based on previous literature: self-identified gender, age, ethnicity, education, and duration of homelessness.[5,17,35,36] The potential modification effect of resilience on the association between ACEs and mental health outcomes was assessed using an interaction term between total ACE score and resilience. Second, multiple imputation by chained equations (MICE) was used to infer missing data pertaining to total ACE score (127 missing), ethnicity (22 missing), education (24 missing), duration of homelessness (33 missing), resilience (77 missing), and Colorado Symptom Index score (23 missing). One hundred imputed data sets were generated by chained equations using the "mi estimate" program in Stata.[37] This particular number was chosen to reduce Monte Carlo error and improve precision in estimation.[37,38] MICE assumes that data are missing at random, such that systematic differences between missing and observed values can be explained by differences in the observed data.[39,40] All variables used in the analyses were included in the imputation models. Appropriateness of the imputation model and imputed values was confirmed using distribution plots, Kolmogorov–Smirnov tests, and tables of proportions.[41] The imputation diagnostics for total ACE score are shown as an example in Appendix Figure 1 and Appendix Table 2, available online. Third, univariate and multivariable analyses were repeated to assess the associations between ACEs and resilience with mental health outcomes in the full imputed data sets (*n*=565). Results were similar to those observed from the complete case participant analyses. Thus, the regression analyses presented and discussed here are based on the imputed data sets.

All *p*-values are two-sided. No adjustments for multiple testing were applied given interest in individual preplanned hypotheses.[42–44] Moreover, in accordance with recent guidelines, effect sizes are reported as unadjusted ORs and AORs with 95% CIs.[45] All analyses were conducted in 2019 using Stata, version 16.

RESULTS

Of the 565 participants in the total sample, 484 participants (86%) completed the 18-month follow-up interview and 373 (77%) of these participants had a complete set of valid responses. Appendix Table 2, available online, presents the baseline characteristics for the full sample (*n*=565) and the complete (*n*=373) and incomplete case (*n*=192) participants. Complete case participants were more likely to be diagnosed with substance abuse than incomplete case participants. Incomplete case participants were more likely to be diagnosed with psychotic disorder than complete case participants. Otherwise, there were no other significant differences at baseline between participants with complete and incomplete data.

Table 1. Prevalence of ACEs Among Toronto At Home Study Participants (*n*=373)

Variable	*n* (%)
Total ACE score	
0	47 (13)
1	40 (11)
2	37 (10)
3	41 (11)
4	39 (10)
5	44 (12)
6	38 (10)
7	36 (10)
8	22 (6)
9	21 (5)
10	8 (2)
Mean (SD)	4.1 (2.8)
Median (range)	4 (0–10)
Maltreatment	
Sexual abuse (*n*=363)[a]	121 (33)
Emotional abuse (*n*=370)	210 (57)
Physical abuse (*n*=367)	209 (57)
Emotional neglect (*n*=363)	188 (52)
Physical neglect (*n*=369)	126 (34)
Household dysfunction	
Parental separation/divorce (*n*=363)	172 (48)
Domestic violence (*n*=355)	132 (37)
Household mental illness (*n*=359)	125 (35)
Household criminal justice involvement (*n*=363)	93 (26)
Household substance abuse (*n*=368)	160 (44)

[a]Number of participants who provided a valid response to each item on ACE inventory.
ACE, adverse childhood experience.

In the overall baseline sample (*n*=565), most participants were male (70%) and either black (35%) or white (35%); the mean age at enrollment was 40.4 (SD=11.8) years. Additionally, 47% of participants did not complete high school and 53% had experienced a lifetime duration of homelessness >36 months. The mean baseline resilience score was 5.06 (SD=2.00).

Table 1 summarizes ACEs among participants. The least common reported ACE was having household criminal justice involvement (26%), whereas the most common were emotional and physical abuse (57%). One third (33%) of participants had been sexually abused (an adult touching or fondling the participant; forcing the participant to touch him/her; or attempting to have oral, anal, or vaginal intercourse with the participant). More than half (55%) of participants experienced 4 or more ACEs and only 13% of participants had never experienced an ACE. The mean total ACE score was 4.1 (SD=2.8).

Summaries of total ACE scores across all outcomes and covariates are presented in Table 2. Aboriginal individuals ($p<0.001$) and those who experienced a lifetime

Table 2. Total ACE Score by Sociodemographic Characteristics and Mental Health Outcomes for Toronto At Home Study Participants (*n*=373)

Variables	Mean (SD)	*p*-value
Sociodemographic characteristics		
Gender		0.274
Male	4.01 (2.75)	
Female	4.37 (3.01)	
Age, years		0.184
18–24	4.05 (2.28)	
25–44	4.41 (2.99)	
>44	3.84 (2.77)	
Ethnicity[a]		**<0.001*** **
White	4.64 (2.92)	
Black	3.93 (2.71)	
Aboriginal	6.10 (2.63)	
Other	3.41 (2.79)	
Education		0.058
Complete high school	3.87 (2.80)	
Incomplete high school	4.42 (2.85)	
Duration of homelessness		**0.011***
≥36 months	4.48 (2.88)	
<36 months	3.74 (2.73)	
Mental health outcomes		
Major depressive disorder		0.449
Yes	4.27 (2.87)	
No	4.04 (2.81)	
Manic or hypomanic episode		0.696
Yes	4.29 (3.04)	
No	4.10 (2.80)	
PTSD		**<0.001*** **
Yes	5.10 (2.98)	
No	3.81 (2.71)	
Panic disorder		**0.004****
Yes	5.23 (3.04)	
No	3.93 (2.75)	
Mood disorder with psychotic features		**0.004****
Yes	4.98 (2.88)	
No	3.90 (2.78)	
Psychotic disorder		**0.018***
Yes	3.67 (2.57)	
No	4.36 (2.94)	
Alcohol dependence		**<0.001*** **
Yes	5.10 (2.80)	
No	3.70 (2.75)	
Substance dependence		**<0.001*** **
Yes	5.15 (2.53)	
No	3.50 (2.83)	
Alcohol abuse		0.477
Yes	3.90 (2.60)	
No	4.17 (2.88)	
Substance abuse		0.513
Yes	3.87 (2.78)	
No	4.16 (2.84)	
≥2 mental disorders		**<0.001*** **
Yes	4.56 (2.81)	
No	3.11 (2.62)	
High suicidality		**<0.001*** **
Yes	5.78 (2.60)	
No	3.92 (2.80)	
Colorado Symptom Index ≥30		**<0.001*** **
Yes	4.45 (2.76)	
No	2.92 (2.78)	

Note: Boldface indicates statistical significance (*$p \leq 0.05$; **$p \leq 0.01$; ***$p \leq 0.001$).

[a]*p*-value corresponds to one-way ANOVA test. Pairwise *t*-tests were performed with the following *p*-values: 0.011* for aboriginal vs black, <0.001*** for aboriginal vs other, 0.194 for aboriginal vs white, 1.00 for black vs other, 0.355 for black vs white, and 0.009*** for other vs white.

ACE, adverse childhood experience; PTSD, post-traumatic stress disorder.

duration of homelessness >36 months (p=0.011) were more likely to have higher ACE scores. Participants with negative mental health outcomes, including PTSD (p<0.001), panic disorder (p=0.004), mood disorder with psychotic features (p=0.004), alcohol dependence (p<0.001), substance dependence (p<0.001), more than 2 mental disorders (p<0.001), high suicidality (p<0.001), and severe psychiatric symptomology (p<0.001) had higher ACE scores than those without. Conversely, participants diagnosed with psychotic disorder had lower ACE scores than those without (p=0.018).

Unadjusted ORs, AORs, and 95% CIs for outcome variables included in the univariate (Model 1) and multivariable (Model 2) logistic regression analyses are presented in Table 3. Results from these analyses revealed that total ACE score was positively associated with the following poor mental health outcomes: PTSD (AOR=1.17, 95% CI=1.08, 1.27), panic disorder (AOR=1.15, 95% CI=1.04, 1.27), mood disorder with psychotic features (AOR=1.16, 95% CI=1.06, 1.28), alcohol dependence (AOR=1.21, 95% CI=1.11, 1.31), substance dependence (AOR=1.26, 95% CI=1.17, 1.37), more than 2 mental disorders (AOR=1.23, 95% CI=1.13, 1.33), high suicidality (AOR=1.26, 95% CI=1.13, 1.41), and severe psychiatric symptomology (AOR=1.26, 95% CI=1.14, 1.38).

The AORs and 95% CIs for outcome variables included in the multivariable analyses with resilience added (Model 3) are presented in Figure 1. There was no significant interaction or correlation ($r = -0.00031$)

Table 3. Regression Analyses for Mental Health Outcomes Based on Total ACE Score (*n*=565)

	Model 1		Model 2	
Mental health outcome[a]	**Unadjusted OR (95% CI)**	***p*-value**	**AOR (95% CI)**[b]	***p*-value**
Major depressive disorder	1.06 (0.99, 1.13)	0.094	1.06 (0.99, 1.14)	0.089
Manic or hypomanic episode	1.10 (1.00, 1.22)	**0.050***	1.06 (0.96, 1.18)	0.246
PTSD	1.19 (1.10, 1.28)	**<0.001*****	1.17 (1.08, 1.27)	**<0.001*****
Panic disorder	1.15 (1.05, 1.26)	**0.002****	1.15 (1.04, 1.27)	**0.004****
Mood disorder with psychotic features	1.14 (1.04, 1.24)	**0.003****	1.16 (1.06, 1.28)	**0.001*****
Psychotic disorder	0.91 (0.85, 0.97)	**0.006****	0.91 (0.85, 0.98)	**0.012***
Alcohol dependence	1.22 (1.14, 1.32)	**<0.001*****	1.21 (1.11, 1.31)	**<0.001*****
Substance dependence	1.29 (1.20, 1.39)	**<0.001*****	1.26 (1.17, 1.37)	**<0.001*****
Alcohol abuse	0.97 (0.89, 1.06)	0.542	0.98 (0.89, 1.08)	0.688
Substance abuse	0.97 (0.87, 1.08)	0.550	0.95 (0.85, 1.06)	0.374
≥2 mental disorders	1.25 (1.15, 1.35)	**<0.001*****	1.23 (1.13, 1.33)	**<0.001*****
High suicidality	1.28 (1.15, 1.43)	**<0.001*****	1.26 (1.13, 1.41)	**<0.001*****
Colorado Symptom Index ≥30	1.24 (1.13, 1.35)	**<0.001*****	1.26 (1.14, 1.38)	**<0.001*****

Note: Boldface indicates statistical significance (*$p \leq 0.05$; **$p \leq 0.01$; ***$p \leq 0.001$). Analyses were conducted on 100 imputed datasets.
[a]Separate binary logistic regression analyses (univariate and multivariable) were conducted for each outcome using total ACE score (continuous measure) as an independent variable.
[b]Each multivariable model was controlled for age (continuous), gender (male vs female), ethnicity (aboriginal, white, black, or other), duration of homelessness (continuous), and education (complete vs incomplete high school).
ACE, adverse childhood experience; PTSD, post-traumatic stress disorder.

between resilience and total ACE score. Resilience served as a protective factor against the following poor mental health outcomes: major depressive disorder (AOR=0.84, 95% CI=0.77, 0.93), PTSD (AOR=0.89, 95% CI=0.79, 0.99), mood disorder with psychotic features (AOR=0.88, 95% CI=0.79, 0.99), more than 2 mental disorders (AOR=0.85, 95% CI=0.76, 0.95), and severe psychiatric symptomology (AOR=0.69, 95% CI=0.61, 0.79).

DISCUSSION

These findings suggest strong associations between early adversities and poor mental health outcomes in a sample of homeless adults with mental illness. Total ACE score was positively associated with severity of psychopathology, as indicated by co-occurring mental disorders and high Colorado Symptom Index scores. These results are consistent with past investigations of ACEs among homeless adults. Patterson et al.[18] reported comparable associations among total ACE score and suicidality, alcohol dependence, and substance dependence among homeless adults with mental illness in Vancouver. Another study looked at cumulative associations among 5 types of childhood maltreatment and suicidality among elderly homeless adults, reporting comparable AORs (1.41 and 2.93, respectively).[15] This study contributes novel and clinically relevant insight into the associations among ACEs, psychopathology severity, and several DSM-IV psychiatric diagnoses.

Perhaps more importantly, these findings uncover a protective effect of resilience against severity of psychopathology and several other poor mental health outcomes among homeless adults with mental illness. The protective effect of resilience has also been reported in other settings and populations. Among a sample of Korean firefighters, resilience buffered the impact of traumatic stress on PTSD symptoms.[46] In another study of Irish adults, perceived social support—a key component of resilience—buffered the association between ACEs and later-life depression.[47,48] Current frameworks postulate that present day resilience allows individuals to overcome past adversity via enhanced emotional/cognitive processing, decreased intrusive rumination, and reduced perceptions of entrapment.[49,50] Although there is evidence of resilience stability throughout the life course, resilience is a mutable trait that is reinforced and eroded by several factors.[51–53] Future studies should seek to untangle how lifelong resilience and other protective factors buffer the sequelae of early life adversities.

Trauma is a well-established risk factor for all mental health diagnoses found to be associated with total ACE score in this study.[54,55] These analyses also revealed a positive association between total ACE score and alcohol and substance dependence, but not alcohol and substance abuse. The former categories reflect greater severity.[56] Past studies have suggested that alcohol and substance dependence arise from attempts to cope with early adversity.[57–59] Contrary to past reports, this study found that psychotic disorder was negatively associated with total ACE score.[60–62] However, it is important to note that patients with psychosis often have cognitive impairments and difficulties with reality testing, which might

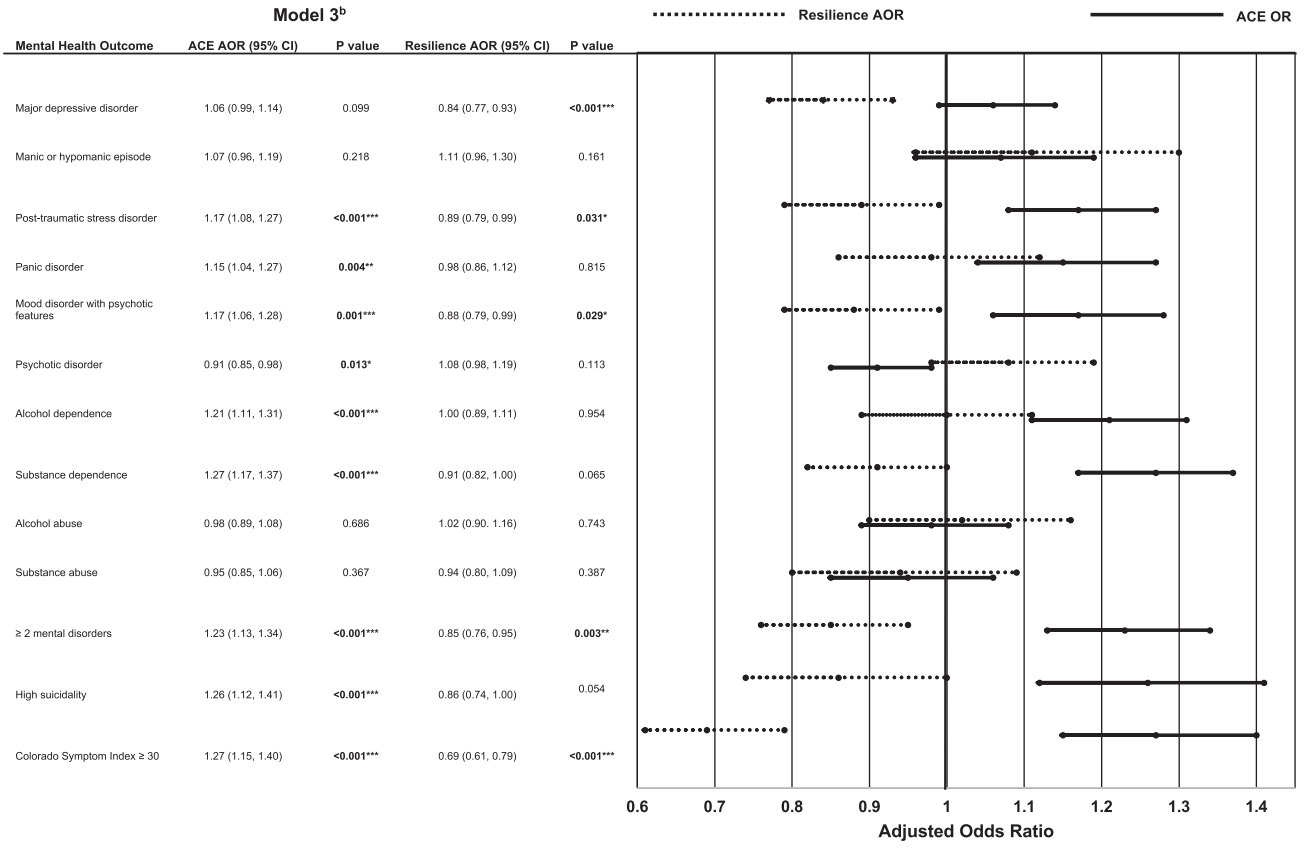

Figure 1. Resilience serves as a protective factor against ACE-associated poor mental health outcomes (n=565). Boldface indicates statistical significance (*$p \leq 0.05$; **$p \leq 0.01$; ***$p \leq 0.001$). Analyses were conducted on 100 imputed datasets. Each multivariable model was controlled for resilience (continuous), age (continuous), gender (male vs female), ethnicity (aboriginal, white, black, or other), duration of homelessness (continuous), and education (complete vs incomplete high school). ACE, adverse childhood experience.

contribute to misreporting of early adversities.[63–65] Other unknown factors might also influence the relationship between ACEs and psychotic disorders in this population, necessitating further research.

The overall number and co-occurrence of ACEs among this sample was quite concerning. The average ACE score was 4.1, with 55% and 24% of participants having experienced 4 or more and 7 or more ACEs, respectively. These numbers are more than fourfold higher than those of the original ACE study, with only 12% and 0.9% of participants having experienced 4 or more and 7 or more ACEs, respectively.[3]

These findings have several implications for policymakers and service providers. Given the high prevalence of ACEs among homeless adults with mental illness, service providers working with this population should prioritize ACE screening.[66] For those exposed to ACEs, these findings suggest that it might be possible to mitigate ACE-associated outcomes by promoting resilience. Resilience is amenable to intervention in adulthood; interventions have significantly improved resilience through course-based training, mindfulness, and well-being therapy.[67–71] Recent studies have also identified engagement in meaningful activities, social support, and personal strength as particular sources of resilience among homeless adults with mental illness.[72,73] ACE screening and resilience building should be incorporated into standard practice within settings that provide care and support to homeless adults.

It is even more important to address childhood adversities in youth and young adults. Early trauma interferes with normal development and increases exposure risk to future adversities, thereby perpetuating negative outcomes across the lifecourse.[74–77] There should be a focus on prevention and treatment of ACEs at an early age. Several family-based intervention programs such as the Triple-P program and the Nurse–Family Partnership have successfully promoted the exposure of children to safe, stable, and nurturing early environments.[74,78,79] Individuals already exposed to ACEs should be referred to appropriate evidence-based treatments, including trauma-focused cognitive behavioral therapies and family therapies.[80–83] Comprehensive screening, prevention, and treatment efforts are necessary throughout the life course to mitigate the devastating detriments of ACEs.

Limitations

The main limitation of this study is that it cannot fully elucidate the causal pathways between ACEs and later-life outcomes. Though ACE exposure occurs early in life by definition, it is difficult to ascertain the temporal order of certain outcomes such as onset of homelessness and mental illness. Further longitudinal studies are required to understand how perceived stress, social support, and other indirect factors might influence the relationship between ACEs and poor mental health outcomes.[84,85]

There are likely other mental health outcomes associated with ACEs that were not investigated in this study. For example, the MINI does not include personality disorders—diagnoses that are prevalent among homeless individuals and associated with ACEs.[86,87] Moreover, the MINI assesses only the presence and absence of psychiatric diagnoses. More precise understanding of the associations between ACEs and mental health outcomes would require information from psychopathology dimensions and symptom scales.[88]

In this study, ACE exposure was assessed retrospectively 18 months after the baseline interview. Although retrospective information is susceptible to recall bias, the ACE questionnaire has good test–retest reliability.[11] Nonetheless, there were a few participants who declined to respond to certain ACE modules, suggestive of the difficulties associated with recalling past trauma. Interestingly, past studies have found that retrospective ACE reporting often underestimates the influence of early adversities on objective health outcomes, including those assessed by neuropsychological tests.[30,89]

There was a non-negligible amount of missing data in the study sample. Compared with list-wise deletion, MICE increases analysis efficiency and reduces bias.[39] However, MICE assumes that data are missing at random and that the propensity of missingness can be explained by other covariates in the imputation model. This is much more defensible than the missing completely at random assumption required for list-wise deletion.[90] However, it is not possible to definitely rule out that data were missing not at random.

Finally, these analyses focused on homeless adults with mental illness in one Canadian city. More research is needed to understand the specific influence of ACEs and resilience on mental health outcomes in the general homeless population and in other geographic settings.

CONCLUSIONS

These findings reveal a high prevalence of early adversities among homeless adults with mental illness and strong positive associations of such adversities with several poor mental health outcomes. Moreover, resilience protects against these ACE-associated outcomes and might serve as a potential target for intervention. Coordinated efforts between families, healthcare professionals, service providers, and policymakers are needed to prevent and treat the lifelong sequelae of early adversities among this vulnerable population.

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All authors contributed to the design of the study. ML, SWH, CML, and JL conceived of the study. ML performed the analysis, interpreted the results, and prepared the first manuscript draft. CML and JL provided guidance on the analysis and structuring of the first manuscript draft. SWH, CML, JL, RN, and VS critically reviewed the manuscript. All authors contributed to and approved the final manuscript.

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SUPPLEMENTAL MATERIAL

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