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Personal Control and Service Connection as Paths to Improved Mental Health and Exiting Homelessness among Severely Marginalized Homeless Youth

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Abstract

Objective—Non-service connected, continuously homeless youth are arguably one of the most vulnerable populations in the U.S. These youth reside at society’s margins experiencing an accumulation of risks over time. Research concludes that as vulnerabilities increase so do poor long-term outcomes. This study tested the mediating effects of service connection and personal control as mediators of cumulative risk and housing, health and mental health outcomes. By understanding the processes associated with therapeutic change among those with the most vulnerabilities, service providers and researchers can target those factors to enhance positive outcomes.

Method—Seventy-nine, non-service connected, substance using homeless youth were offered a strengths-based outreach and engagement intervention and were assessed at baseline 3, 6 and 9 months post-baseline.

Results—Personal control mediated the effects of cumulative risk on housing stability, and service utilization mediated the effects of cumulative risk on mental health.

Conclusions—This study specifies important targets of intervention for a population at high risk for continuing homelessness. In particular, service providers should target youths’ sense of personal control and link them to needed community-based services in order to help them exit street life and improve mental health outcomes.

Keywords

adolescence; intervention; mediation; homelessness

1. Introduction

Adolescents and young adults experiencing homelessness report multiple risks. These risks include high rates of alcohol and drug use, depression, risky sexual behaviors, and victimization (Lim, Rice, & Rhoades, 2015; Saddichha, Linden, & Krausz, 2014). Homeless

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individuals are more likely to have chronic and/or untreated medical conditions and higher mortality than housed populations (Beech et al., 2003; Roy et al., 1998). Several studies have explored pathways into homelessness, but fewer studies have investigated factors influencing the exit from homelessness (Gabrielian et al., 2015), especially among youth (Eddin, Ganim, Hunter, & Karnik, 2012; Slesnick et al., 2009). The few completed intervention studies utilized samples of homeless youth engaged from drop-in centers or shelters, representing already service-connected youth. Youth not accessing services are likely those most in need of outreach and engagement because these youth have even more severe risk factors including decreased likelihood of exiting homelessness, and higher substance use and mental health problems, compared to service connected homeless youth (Kryda & Compton, 2009). In order to better specify factors that mediate the accumulation of risk on outcomes among these vulnerable youth, this study examined the effects of service connection and personal control as mediators on housing, physical and mental health outcomes.

1.1 Cumulative Risk Among Homeless Youth

Many studies document the deleterious effects of cumulative risk among those experiencing homelessness, supporting the accumulation of risks perspective (e.g., Lehmann, Kass, Drake, & Nichols, 2007). This model suggests that problems accumulate over the life course to predict negative health and psychosocial outcomes (Lynch & Smith, 2005). “Earlier advantages (and disadvantages) influence the accumulation of resources (or hardships) through the life course, and exacerbate health inequalities over time” (Lippert & Lee, 2015, p. 346). Individuals who were exposed to one adversity in childhood are more likely to experience a second adversity later in life (Dong et al., 2004). Researchers have identified a series of risk factors that homeless youth often experience such as maltreatment, depression, survival sex, and substance use, and gang involvement (Cauce, Tyler, & Whitbeck, 2004; Yoder, Whitbeck, & Hoyt, 2003; Zerger, Strehlow, & Gundlapalli, 2008). Adversities are not only highly correlated with each other and with homelessness, but also with the onset and persistence of psychiatric disorders (Lehmann, Kass, Drake & Nichols, 2007; Lim, Rice & Rhoades, 2015). For example, studies note that chronically homeless adults who experienced more childhood problems are significantly younger when they first become homeless and have more severe drug use prior to receiving housing support (Tsai, Edens, & Rosenheck, 2011). Similarly, homeless youth researchers note that the longer a young person experiences homelessness, the more likely they are to experience substance use, victimization and mortality, and the more difficult it becomes to exit street life (Ferguson et al., 2011; Scutella et al., 2013).

Prevention of continuing homelessness into adulthood is imperative. Rayburn (2013) tracked substance abusing homeless adults 20 years following a stay in a homeless service program, and found that individuals in their early 30’s were still experiencing struggles with addiction, unstable employment, the law and homelessness in their early 50’s. Identifying factors that buffer the negative effects of cumulative risk can be a step towards prevention of chronic homelessness. Once identified, these buffering factors can be targeted to improve outcomes related to housing, and physical and mental health.

1.2 Protective Factors

Studies with adult populations consistently show that those with access to a social service worker, or who utilize community services, are more likely to exit homelessness (Gabrielian et al., 2015; Raleigh-DuRoff, 2004; Zlotnick, Tam, & Roberston, 2003). In regard to homeless youth, the more connections youth report with formal and informal support systems, the more likely they are to increase housing stability (Slesnick et al., 2008). While it is expected that increased service connection plays a critical role in improving youth outcomes, it is important to identify mechanisms through which service connection leads to positive outcomes. According to Bandura's Social-Cognitive Theory (1977; 1986), self-efficacy is the major mechanism of change in human behavior, and is defined as "people's beliefs about their capabilities to exercise control over their own level of functioning and over events that affect their lives" (Bandura, 1993, p. 118). Homeless individuals often feel a lack of personal control over their lives, but perceived control has been strongly linked to mental health (Hodgson et al., 2015; Pearlin et al., 1981), and housing outcomes (Tsemberis et al., 2004). It was of interest in this study to test whether personal control serves as the mechanism linking service connection and positive outcomes.

1.3 Current Study

In order to address the multiple needs of homeless youth, and to prevent continued homelessness and mental health problems into adulthood, research attention on identifying modifiable factors associated with improved outcomes is of paramount importance. Because many youth avoid accessing mainstream health services (Ensign & Gittelsohn, 1998), outreach and engagement services are essential to begin the process of re-engagement. Client level factors, such as service use and personal control, have been identified as predictors of housing, physical and mental health outcomes, but no prospective studies identifying mediators of change have been conducted with homeless youth. Therefore, in this study, personal control and service connection were hypothesized to mediate the long-term indirect effects of cumulative risk on housing stability, mental and physical health, with personal control also mediating the relationship between service connection and the targeted outcomes. Figure 1 shows the hypothesized model.

2. Methods

2.1 Participants

Homeless youth between the ages of 14 to 24 years were recruited from homeless camps, the library, a church sandwich line and other locations homeless youth are known to hang-out. One hundred twenty-eight (N = 128) youth were approached to participate in the study, and of those, 61% (N = 79) were eligible and agreed. Those who were not eligible were provided a resource list. In order to be eligible for the study, youth reported experiencing homelessness for the prior 3 months, had not sought services through a shelter, drop-in center or substance use/mental health treatment program in the prior 3 months and reported at least six uses of alcohol/drugs in the prior 30 days. See Table 1 for a summary of demographic variables. In brief, 53% of the sample was male, the average age was 20.8 years (SD = 2.13) and the majority of youth reported being White, non-Hispanic (57%) or

African American (32%). Many youth reported a history of childhood sexual (n=33, 41.8%) or physical abuse (n=36, 45.6%).

2.2 Procedure

Youth were approached and screened during outreach by a research assistant (RA). Upon consent or assent (for those 14–17 years), the baseline self-report assessment was administered, requiring about one hour. All youth received Strengths-Based Outreach and Advocacy (SBOA). The focus of SBOA was randomly determined to be connecting youth with a crisis shelter, or a drop-in center, in addition to any other needed services. Follow-up assessment interviews were conducted at 3, 6, and 9 months post-baseline, using an intent to treat design. Follow-up rates were high: 87% (69/79) at 3 months, 89% (70/79) at 6 months and 91% (72/79) at 9 months. Participants received a \$40 Walmart gift card at the completion of each assessment battery, and a \$5 food gift card for each advocacy session attended. All research procedures were approved by the Institutional Review Board at The Ohio State University.

2.3 Strengths-Based Outreach and Advocacy (SBOA) Intervention

SBOA included 6 months of advocacy to encourage and assist youth in receiving needed services. The advocate took responsibility for securing services (such as obtaining a government issued identification card, government entitlements, health/mental health care, employment and housing assistance, etc.) for the youth and remained a support as he/she traversed the system of care. The advocate met the youth wherever the youth was willing to meet which was usually in non-office settings such sandwich lines/soup kitchens, homeless camps, libraries and parks, and encouraged youth to access community services and supports. Successful interactions with service programs and the advocate were expected to build personal control self-efficacy. This approach is most similar to the Strengths Model (developed at the University of Kansas School of Social Welfare) in which the role of the outreach worker falls somewhere between a therapist and a broker (Rapp & Chamberlin, 1985). The strengths-based outreach approach also includes the following features: 1) dual focus on client and environment, 2) use of paraprofessional personnel, 3) a focus on client strengths rather than deficits, and 4) a high degree of responsibility given to the client in directing and influencing the intervention that he/she receives from the system and the outreach worker. In this study, five youth did not attend any advocacy meetings and on average, youth met with their advocate 22.7 (SD = 18.9) times.

2.4 Measures

Cumulative risk—Cumulative risk was assessed at baseline. The cumulative risk index included several risk factors commonly experienced by homeless youth, as identified by the literature (e.g., Zerger et al., 2008): depressive symptoms, ever injected drugs, ever engaged in survival sex, ever been arrested, ever been in a gang, currently in need of detoxification, had more than one sexual partner within 24 hours, and a childhood physical/sexual abuse history. All these variables were dichotomized (0 as an absence of risk, 1 as a presence of risk), and were then summed to yield a total score with higher scores representing greater risk exposure (Buehler & Gerard, 2013; Evans, Kim, Ting, Teshler, & Shannis, 2007). The

21-item Beck Depression Inventory-II (BDI-II; Beck, Steer, & Brown, 1996) was used to measure depressive symptoms. In the current sample, the reliability of BDI-II was 0.94. Each item is rated on a scale of 0 to 3 and total scores ranged from 0 to 63, with higher scores indicating higher levels of depressive symptoms. A score of 19 was used as the cut-off (0–19 is considered minimal to mild depression, and 20–63 indicates moderate to severe depression). The other variables comprising the cumulative risk index were queried on the homeless experiences form. The total scores for the cumulative risk index ranged from 0 to 8. Because few youth indicated that they were exposed to 7 or 8 risks, they were collapsed into one group

Service utilization—Youth reported using a range of services at 3 months including assistance with substance use, mental health, employment, personal finances, housing, medical care, dental care, intimate relationships, legal issues, and intimate partner violence. The utilization of each service was dichotomized with one representing service use, and zero representing no use.

Personal control (self-efficacy)—*Personal control (self-efficacy)* was assessed using Pearlin and Schooler's (1978) 7-item Mastery Scale at 3 and 6 months. The instrument has robust psychometric properties (Pearlin & Schooler, 1978) and has proven validity with those experiencing homelessness (Greenwood et al., 2005). In the current study, the reliability of this scale was $m .76$ at 3 months, and $.75$ at 6 months.

Housing stability—Youth were asked on how many nights they spent in their own room or apartment (stable housing, paying rent) over the last 3 months. Housing stability was assessed at baseline and 9 months.

Physical and mental health—The *Short-Form-36* is a multi-purpose short-form health survey that is used as a general assessment of physical and mental health status. The survey uses 36 items to develop eight scale scores that are then combined to estimate the overall mental health score and an overall physical health score. The measure has shown high reliability and validity (Ware et al., 1993). It was used to assess physical and mental health of youth at baseline and 9 months. In the current sample, the reliability for physical health was 0.88 at baseline and 0.90 at 9 months. For mental health, the reliability was 0.89 at both baseline and 9 months.

2.5 Overview of Analyses

Data were analyzed in two steps. First, a latent class analysis was performed with Mplus 7.31 (Muthén & Muthén, 2014) to identify subgroups of youth in regard to their service utilization. It was expected that youth varied in their levels of service utilization, i.e., high service utilization versus low service utilization. Several criteria were used to determine the optimal number of classes. A significant p value of Lo-Mendell-Rubin Likelihood Ratio Test (LMR) and Bootstrap Likelihood Ratio Test (BLRT) indicates that a model with k classes fits better compared to a model with $k-1$ classes. Moreover, a smaller value of Bayesian information criterion (BIC) and a sample-size adjusted BIC indicates a better model fit (Nylund, Asparouhiov, & Muthén, 2007). With a small sample size, the sample-size

adjusted BIC performs better to identify correct latent classes (Tofiqhi & Enders, 2007; Yang, 2006). Second, a path analysis was performed to examine the longitudinal effects of cumulative risk on housing stability, physical, and mental health at 9 months, and the mediating effects of personal control and service utilization. Youth's age, gender, and intervention condition (drop-in versus shelter-linkage) were added as control variables. Housing stability, physical, and mental health at baseline were also controlled.

Bayesian estimation was utilized because the sample size of this study is relatively small, and some study variables were skewed even after transformation. With Bayesian estimation, large sample size and normal distribution of parameter estimates are not required (Muthén, 2010; Muthén & Asparouhov, 2012). The following indices are used to evaluate model fit: Bayesian posterior predictive checking (PPC) method (95% confidence interval in which a negative lower limit indicates good fit) and the posterior predictive p value (PPP; a value around .5 indicates good fit and low values indicate poor fit) (Muthén, 2010; Muthén & Asparouhov, 2012).

3. Results

Table 2 presents the means, standard deviations, and bivariate correlations of the study variables. Independent sample t-tests and correlation analysis were conducted to examine the relationship between age, gender, race and youth's housing, physical and mental health at baseline. Results showed that females had lower levels of physical and mental health compared to males while housing, physical and mental health did not differ by age or race. After transformation, the skewness of all outcome variables fell between -1.96 and 1.96 . Correlation analysis showed that physical health was not associated with cumulative risk, personal control, or service utilization; therefore, physical health was not included in further testing of the path model. The path model was fit respectively for housing stability and mental health. Little's Missing Completely At Random test (MCAR) using SPSS version 22 was performed to determine whether data were missing at random. The test showed that data were missing completely at random with $\chi^2(37) = 43.55, p = .213$.

3.1 Primary Analyses

3.1.1 Latent class analysis of service utilization—A latent class analysis was performed with service use at 3 months. Table 3 presents the results. The two-class model was considered optimal with significant p values for both LMR ($p < .05$) and BLRT ($p < .001$). Although the three-class model had a smaller value of the sample-size adjusted BIC (760.235) compared that of the two-class model (773.273), the LMR and BLRT became non-significant at three classes, indicating that the three-class model did not improve in model fit compared to the two-class model. Two groups were identified: high service utilization group ($n=34, 44.4\%$), and low service utilization group ($n=39, 55.6\%$).

3.1.2 Direct effects between cumulative risk, personal control, service utilization, housing stability, and mental health—The path model was tested for housing stability and mental health respectively. In the path model, service utilization was a binary mediator. For the model of housing stability, the results indicated a good fit of the model to the data with 95% CI $[-19.760, 17.096]$ for PPC and PPP = .59 (Figure 2). As for

direct effects among study variables, with Bayesian estimation, a 95% credibility interval excluding zero indicates significant effects. As expected, results showed that greater exposure to cumulative risk predicted lower levels of personal control at 3 months ($B = -.58$, posterior $SD = .24$, $\beta = -.27$, $p < .05$), and increased probability of service utilization ($B = .26$, posterior $SD = .08$, $\beta = .39$, $p < .001$). Additionally, higher levels of personal control at 6 months predicted higher levels of housing stability at 9 months ($B = .42$, posterior $SD = .17$, $\beta = .31$, $p < .05$).

For the model of mental health (Figure 3), the model fit was good with 95% CI [-24.967, 18.926] for PPC and $PPP = .53$. Greater exposure to cumulative risk predicted increased probability of service utilization ($B = .15$, posterior $SD = .12$, $\beta = .23$, $p < .05$) and poorer mental health at 9 months ($B = -2.14$, posterior $SD = .81$, $\beta = -.31$, $p < .001$). Higher levels of service utilization in turn predicted better mental health at 9 months ($B = 2.77$, posterior $SD = 1.45$, $\beta = .26$, $p < .05$). Moreover, higher levels of personal control at 6 months in turn predicted better mental health at 9 months ($B = 1.06$, posterior $SD = .31$, $\beta = .35$, $p < .001$).

3.1.2 Mediation effects of personal control and service utilization—The bootstrapping procedure recommended by Shrout and Bolger (2002) to test mediation is not needed with Bayesian estimation. Bayesian estimation provides non-symmetric credibility interval for indirect effects. The significant indirect path coefficients with a 95% confidence interval excluding zero indicates that the mediation is confirmed (Muthen, 2011). Table 4 presents the indirect effects among research variables. Specifically, for housing stability, personal control mediated the effects of cumulative risk on housing stability ($B = -.13$, $p < .05$). However, service utilization did not mediate the effects of cumulative risk on housing stability. For mental health, service utilization mediated the effects of cumulative risk on mental health ($B = .38$, $p < .05$), but surprisingly, personal control did not mediate the effects of cumulative risk on mental health.

4. Discussion

Identifying mechanisms linking cumulative risk and housing, physical and mental health outcomes among homeless youth is critical for understanding the process of change. This study's sample uniquely focused on non-service connected homeless youth who reported no service connection in the prior three months. Without intervention, these youth are at great risk for continuing to live on society's margins. Specifying those factors associated with a strengths-based outreach and advocacy intervention that mediate cumulative risk is an important first step for future replication, and has clear intervention and policy implications. In the current study, personal control was hypothesized to be the key mechanism transmitting the effects of youth's risk exposure and service connection to youths' outcomes. The results from both the correlation and path analyses showed that cumulative risk was significantly associated with personal control at 3 months, with greater risk exposure relating to lower levels of personal control; however, the association between cumulative risk and personal control at 6 months became nonsignificant. This finding suggests that increased service connection interrupts the negative effects of risk exposure on homeless youths' personal control. Moreover, the significant mediating effects of personal control on youth's housing stability suggests that personal control may have increased with successful

interactions with service programs which lead to greater housing stability. Although other studies have shown that greater risk exposure is associated with less service utilization among homeless youth, the current findings showed that youth with greater risk exposure were more likely to use services over time. Prior studies did not assess change in service utilization over time. Therefore, it is likely that in this study, the positive relationship with the advocate increased youths' willingness and confidence to access services over time.

4.1 Housing

Supporting social cognitive theory (Bandura, 1993), personal control mediated the long-term indirect effects of cumulative risk on housing stability. Even in the face of multiple risks, if a youth's sense of personal control increases, they are more likely to exit homelessness and maintain independent housing. This study did not assess or intervene in skill acquisition, however, it is possible that for many youth, as confidence increases, so does a willingness to employ already established skills. Future research may determine that some youth need assistance with skill acquisition while others need help to unblock implementation of existing skills. Regardless of the specific underlying mechanism of change, these findings suggest that service providers should target youth's experience of personal control when seeking to help them obtain greater housing stability.

Service utilization did not mediate the long-term indirect effects of cumulative risk on housing stability. This finding is inconsistent with studies indicating that higher service use is a key predictor of housing stability (Gabrielian et al., 2015; Slesnick et al., 2008). However, the small sample size likely reduced the power to detect a significant effect in the presence of personal control, with personal control having the stronger impact on housing than service use. Alternatively, methodological and sample differences might explain the discrepancy. Many studies examining service use on housing stability also provided housing, whereas this study did not provide housing. The majority of youth in this study obtained housing independently, outside of service programs. Ultimately, successful exit of homelessness, when housing is not offered through a housing first or other housing program, may be more associated with personal factors such as personal control self-efficacy than service use.

4.2 Mental Health

Service use, but not personal control, mediated the effects of cumulative risk on mental health outcomes. Further examination sheds light on this finding. When excluding service connection, personal control was a significant mediator, but when service connection was added to the model, the significant mediating path of personal control became non-significant. In other words, service use appears to compete with personal control and shows a stronger effect on mental health outcomes. In fact, service use has consistently been associated with better mental health outcomes among those experiencing homelessness (Gabrielian et al., 2015; Small, 2010). Given that mental health problems are strongly connected to social isolation and loneliness, especially among those experiencing homelessness (Cruwys et al., 2014; Hodgson et al., 2015), service connection might mediate cumulative risk and mental health status by reducing loneliness and social isolation. Alternatively, services might have imparted other benefits to mental health such as skills

acquisition, and access to medication, etc. However, more research is needed to more precisely specify factors associated with this pathway.

4.3 Physical Health

Physical health outcomes at 9 months were uncorrelated with cumulative risk, personal control and service utilization. This finding is perplexing as the prevalence of physical illness has been found to be similar among homeless youths as compared to adults 20 years older (Saddichha, Linden, & Krausz, 2014). However, the correlation results showed that physical health outcomes were positively correlated with mental health outcomes at nine months, implying that physical health co-occurs with mental health. Although physical health may be influenced by mechanisms different from mental health, physical health outcomes appear to improve when mental health outcomes improve. Future research will need to identify more powerful predictors of change in physical health status, perhaps such as formal, targeted health interventions.

4.4 Limitations

A primary limitation of this study is the small sample size. A larger sample is needed to increase statistical power and reduce potential type 2 error. Even so, evidence of mediation with this small sample provides confidence in the robustness of the observed findings. Another limitation is the short follow-up, as a longer assessment period could elucidate patterns of change that occur more slowly than that captured in the 9 month follow-up. This study focused on a chronically homeless youth sample, with 77% of youth reporting one year of continuous homelessness. The sample is unique and understudied, but may not represent homeless youth engaged through drop-in centers, shelters or other service programs. Also, there may be differences in service availability across different regions of the country, and findings may not generalize to other cities. Future research will need to examine how pre-existing conditions, or experiences prior to homelessness, influence service use outcomes. And finally, qualitative research could offer insight into why youth in this study avoided accessing services.

4.5 Conclusions

The youth in the current study reported a significant number of vulnerabilities, accumulated over time, which research has shown to be related to poor short and long-term outcomes. These youth are at significant risk of becoming chronically homeless adults, and powerful, targeted interventions are needed. By identifying mediators associated with change, providers and researchers are better able to optimize change (Kazdin, 2007). That is, these findings are generalizable to practice in that interventions may succeed in improving housing and mental health outcomes through targeting service connection and personal control. While this study indicates that service use and personal control mediate outcomes and should be targeted to improve outcomes, these factors may or may not explain the underlying mechanisms of change. Possibly, increased service use reduced social isolation, and successful interactions with others increased one's sense of personal control. This study is a first step towards uncovering processes associated with change among the most marginalized homeless youth, and supports a greater investment in outreach and engagement that links youth in a strengths-based fashion to services while also empowering youth.

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Highlights

- This study examines housing stability, mental health, and physical health outcomes of non-service connected homeless youth.
- Service utilization mediated the impact of cumulative risk on mental health outcomes.
- Personal control mediated the impact of cumulative risk on housing stability.

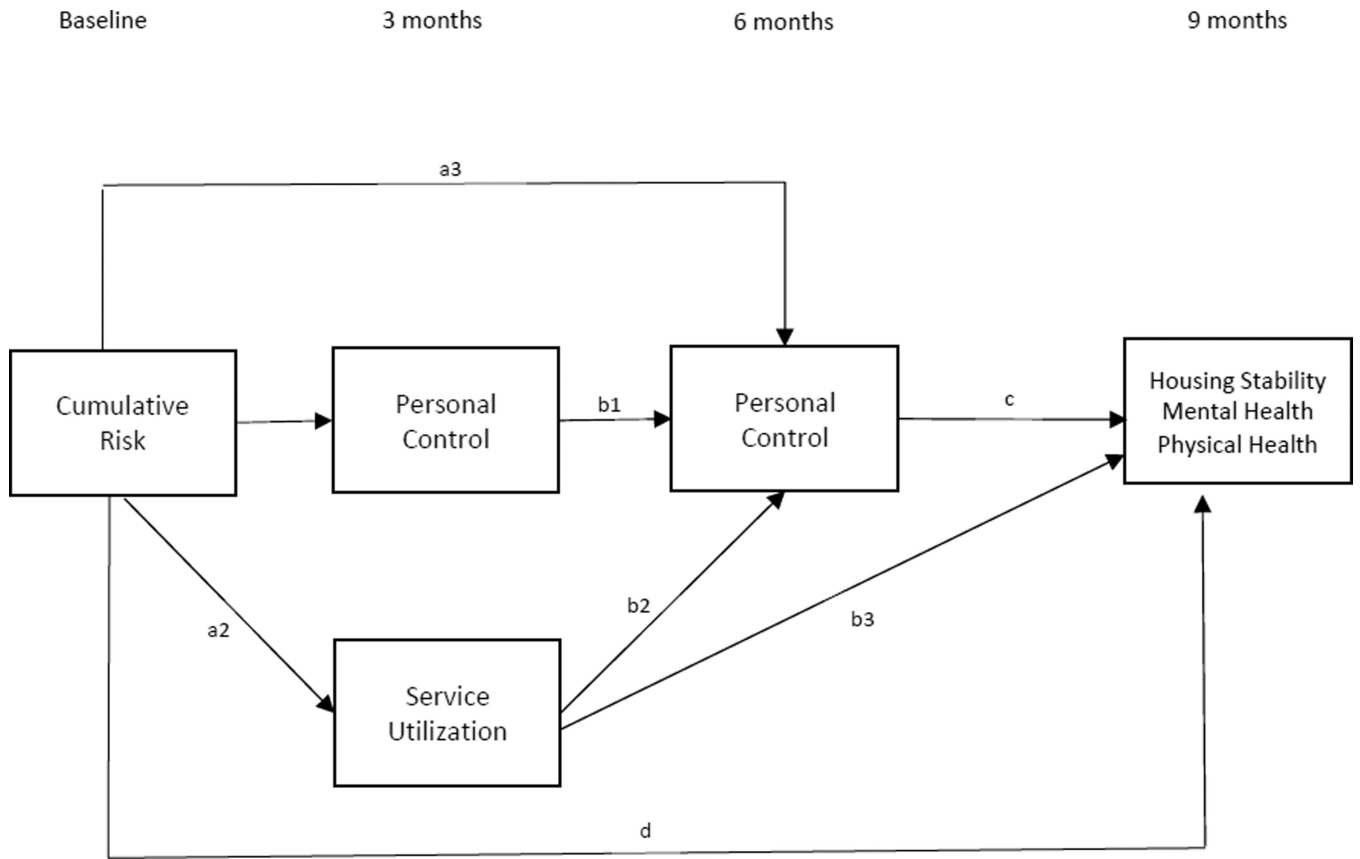


Figure 1.
 Hypothesized model
Note. For visual simplicity, control variables are not shown in the model.

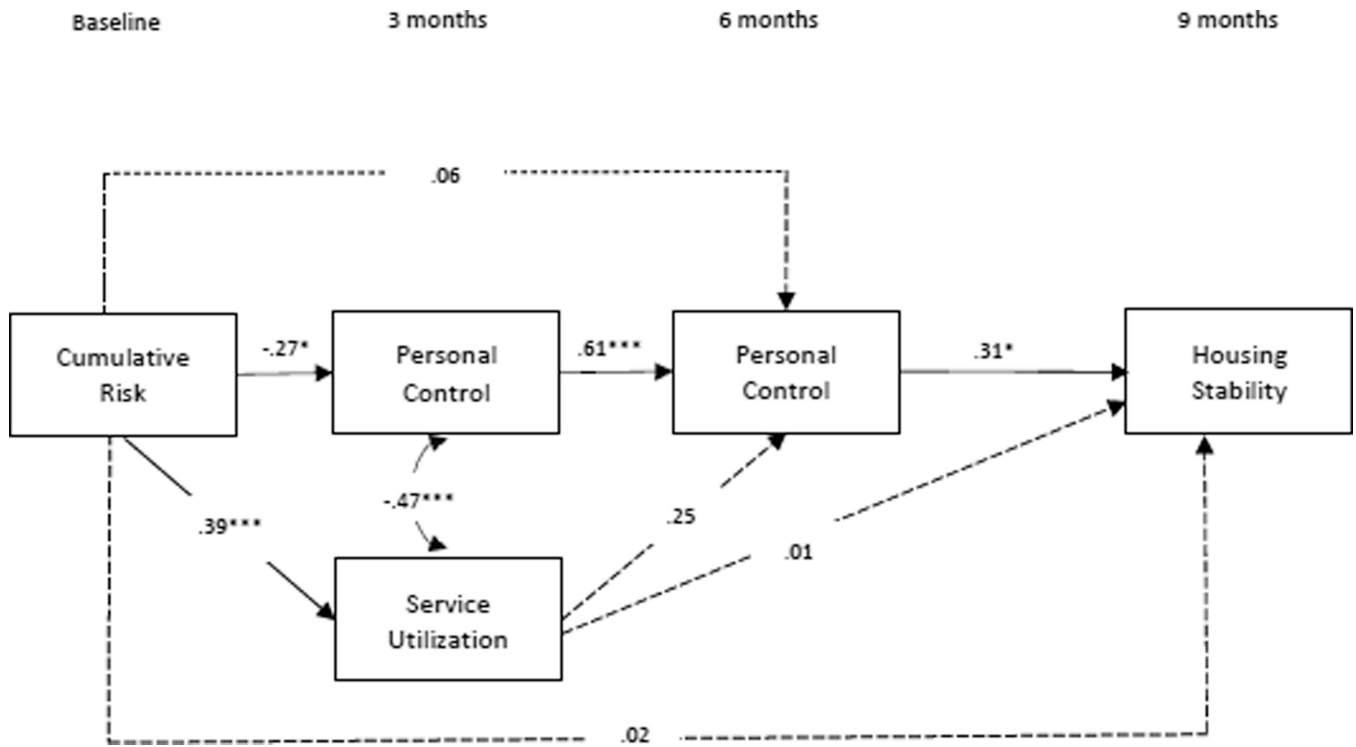


Figure 2. Results of parameter estimates for the mediation model of housing stability.
Note. The values shown are standardized path coefficients. $*p < .05$. $**p < .01$. $***p < .001$. Significant paths are represented by solid lines. Non-significant paths are represented by dashed lines. Service utilization is a dichotomous mediator. With Bayes estimation, the link between cumulative risk and service utilization is a probit regression. The coefficient $.39$ indicates that for one unit increase in cumulative risk, the z-score of service utilization increases by $.39$.

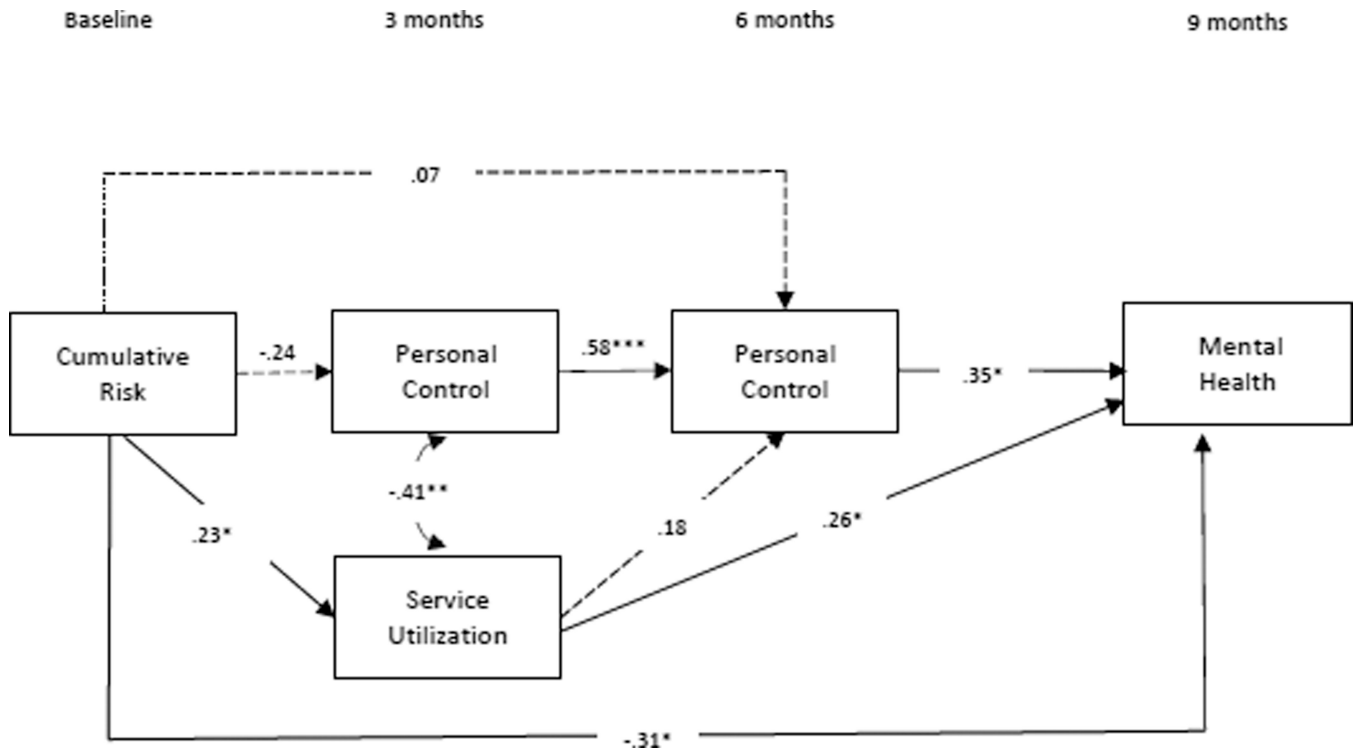


Figure 3. Results of parameter estimates for the mediation model of housing stability.
Note. The values shown are standardized path coefficients. * $p < .05$. ** $p < .01$. *** $p < .001$. Significant paths are represented by solid lines. Non-significant paths are represented by dashed lines. Service utilization is a dichotomous mediator. With Bayes estimation, the link between cumulative risk and service utilization is a probit regression. The coefficient .23 indicates that for one unit increase in cumulative risk, the z-score of service utilization increases by .23.

Table 1

Demographic Characteristics of the Current Sample

Variable	n (%)	<i>M (SD)</i>
Sex		
Female	37(46.8)	
Male	42(53.2)	
Race/ethnicity		
White, not of Hispanic Origin	45(57.0)	
Other	34(43.0)	
Abuse history		
Sexual abuse	33(41.8)	
Physical abuse	36(45.6)	
The number of nights participants stayed in different settings over the past 12 months		
in stable housing (paying rent)		41.32 (92.09)
With family members in their home		89.10 (115.74)
With friends in their home		94.42 (107.59)
With romantic partners in their home		18.59 (51.23)
in a shelter or mission		6.97 (30.82)
in abandoned building		11.09 (46.74)
in jail		8.38 (22.77)
someplace indoors (e.g., a bus or a train station)		4.38 (26.57)
someplace outdoors (e.g. on the street or in a park)		71.94 (105.39)
in a residential treatment program		6.89 (28.51)
any place haven't mentioned		7.91(32.47)

Table 2

Means, Standard Deviations, and Correlations for Study Variables

Variables	M	SD	1	2	3	4	5	6	7	8	9	10
1. CR	3.03	1.62	--									
2. Service	46%	-	.26*	--								
3. PCS_3m	21.23	3.43	-.27*	-.40**	--							
4. PCS_6m	22.39	3.50	-.03	-.04	.48**	--						
5. Housing_b	4.06	14.41	.01	-.03	.07	.20	--					
6. Housing_9m	27.26	39.51	.07	.05	.20	.28*	.09	--				
7. Men_health_b	43.15	10.80	-.33**	-.08	.28*	.09	-.15	.26*	--			
8. Men_health_9m	54.38	10.24	-.21	.12	.17	.38**	.17	.19	.16	--		
9. Phy_health_b	62.45	12.02	-.27*	-.12	.31*	.05	.07	.26*	.65**	.13	--	
10. Phy_health_9m	74.05	10.94	-.04	.03	.15	.19	.12	.09	.06	.69**	.12	--

Note. Dashes indicate that data were not applicable. Service is a dichotomous variable. CR = cumulative risk; PCS_3m = personal control at 3 months; PCS_6m = personal control at 6 months; Service = service utilization; Housing_b = # nights stably housed at baseline; Housing_9m = # nights stably housed at 9 months; Men_health_b = mental health at baseline; Men_health_9m = mental health at 9 months; Phy_health_b = physical health at baseline; Phy_health_9m = physical health at 9 months.

* $p < .05$.

** $p < .01$.

Table 3

Fit Indices for Latent Class Models

Model	BIC	ABIC	LM	BLRT
2-class	839.445	773.273	-398.203 *	-398.203 ***
3-class	861.068	760.235	-374.672	-374.672

Note. BIC = Bayesian information criterion; LMR =Lo-Mendell-Rubin Likelihood Ratio Test; BLRT=Bootstrap Likelihood Ratio Test.

* $p < .05$;

** $p < .01$;

*** $p < .001$.

Table 4
 Bayes Results for Indirect Paths for Models of Housing Stability and Mental Health

Parameter	B	Posterior SD	One-tailed <i>p</i>	95% CI
Housing stability				
Path a1*b1	-.36	.17	.01	[-.671, -.053]
Path a1*b1*c	-.13	.09	.02	[-.332, -.007]
Path a2*b2	.19	.15	.08	[-.129, .507]
Path a2*b2*c	.07	.07	.09	[-.034, .215]
Path a2*b3	.01	.18	.47	[-.404, .359]
Mental health				
Path a1*b1	-.29	.17	.03	[-.672, .004]
Path a1*b1*c	-.28	.21	.03	[-.833, .003]
Path a2*b2	.08	.14	.14	[-.066, .439]
Path a2*b2*c	.08	.15	.14	[-.065, .513]
Path a2*b3	.38	.45	.02	[.002, 1.772]

Note. Bolded rows indicate significant indirect effects. See the hypothesized model for path denotations.