

Residential Trajectories of Street Youth—the Montréal Cohort Study

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ABSTRACT *Little is known about the course of homelessness among youth between the ages of 18 and 25 despite the many characteristics distinguishing them from adolescents and from older street-involved populations. We examined the residential trajectories of homeless young adults in Montréal over a 21-month period and identified determinants of various trajectory profiles. The 365 study participants (79 % men, mean age 21.9 years) were followed for an average of 515 days (range 81–630 days). We assessed housing status with a questionnaire based on the residential follow-back calendar designed by the New Hampshire Dartmouth Research Center. Using latent growth analysis to examine achievement of residential stability over time, we observed three different trajectories: group 1 presented a low probability of housing throughout the entire study period; group 2 showed a high probability of early and stable housing; group 3 displayed a fluctuating pattern. Protective correlates of residential stability included high school education, birth in Canada, and presence of mental health problems. Drug abuse or dependence was associated with a decreased probability of housing.*

KEYWORDS *Homelessness, Residential stability, Street youth, Drug abuse or dependence, Mental health*

INTRODUCTION

Street youth are a particularly vulnerable population for chronic homelessness and health-related harms. Several studies have shown that these youth experience major residential transitions over relatively short time periods, alternating between lack of any housing, extremely precarious housing, and stable and autonomous housing.^{1–3} Street youth also present several health problems and challenges that are often exacerbated if not precipitated by homelessness episodes. These include hepatitis B, hepatitis C, HIV infection, mental health disorders, substance abuse and dependence, pregnancy, and physical abuse or assault.⁴ The high frequency of these health outcomes is associated with elevated mortality rates; reported standardized

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mortality ratios range between 2.7 and 37.3 when compared to mortality in the general population.⁵

The concept of housing is complex; its importance in health research has been recognized by several researchers. They have highlighted the need to better conceptualize and refine housing definitions, including homelessness, and to take into account both the dynamic nature of people's housing status and types of physical settings in which they live.^{6, 7} We identified only six longitudinal studies that quantitatively examined residential trajectories of homeless street youth⁸⁻¹³. Five of these studies included adolescents,⁹⁻¹³ and two^{9, 12} focused specifically on newly homeless youth. Various measures of housing and residential trajectories were reported, including type of housing in which youth were living at selected follow-up dates, percentage of days being housed over follow-up time,^{10, 11} number of times subjects moved,⁹ proportion of subjects never returning home,⁹ and proportion of subjects cycling in and out of homelessness.¹² These measures were based on questions about current housing status at time of interview or recall of various living situations since the last interview. None of the reviewed studies appears to have determined housing status on a day-to-day basis. Depending on the parameter used, between 30 % and 48 % of study subjects attained a certain level of housing stability over 12-24 months of follow-up.

It is well acknowledged that the young adult or late adolescent stage is crucial to a normal outcome in adult functioning.¹⁴ During this stage, many developmental tasks need to be completed to successfully transition to adulthood. Furthermore, the course of homelessness among young adults remains poorly documented despite the many characteristics distinguishing them from adolescents and from older street-involved populations. Increased understanding of residential trajectories of homeless young adults will help formulate better public health interventions related to housing, with the ultimate goal of improving the quality of life and health of these youth.

We report below the results of a longitudinal study of the residential trajectories of homeless young adults in Montréal between 2006 and 2009. The main objective of this paper is to describe the residential trajectories of homeless youth, with a focus on the heterogeneity of these trajectories. We also examine trajectories based on different definitions of residential stability. A secondary objective is to explore correlates of residential stability.

METHODS

Between April 2006 and May 2007, study interviewers recruited street youth through regular visits to all major street youth agencies in Montréal, Canada. Each eligible subject was given an appointment for an interview at our study office, located in the downtown area where most homeless youth live. As in our previous studies⁵, youth who had used the services of Montréal street youth agencies at least three times in the previous year or had been without a place to sleep more than once during the same period were considered currently street-involved. Only street youth who had experienced at least one 24-hour episode of homelessness in the previous 30 days were eligible for this study. A 24-hour episode of homelessness was defined as having spent at least one night in a place unfit for human habitation or having been housed temporarily in an emergency shelter or with friends or acquaintances. Other eligibility criteria included being 18-25 years of age, speaking French or English, being able to provide informed consent and complete an interviewer-

administered questionnaire, and planning to stay in the Montréal area for the following year.

The initial interview included signing a consent form and collecting contact information. Six follow-up interviews took place every 3 months until January 2009. Detailed contact information was updated at each interview, and thorough follow-up procedures were used. Participants received financial compensation (CAD \$30) for each interview. This paper presents results for subjects who completed at least one follow-up interview.

Measurements

All questionnaires were administered by interviewers trained specifically for this study. The baseline interview included questions about sociodemographic variables, homelessness, substance abuse and dependence, and mental health. Questions about diagnoses of major depression, bipolar disorders, anorexia/bulimia, and schizophrenia were taken from the World Mental Health Composite International Diagnostic Interview (CIDI) version 2.1.¹⁵ Anxiety and alcohol/drug-related disorders were assessed using the simplified version (CIDIS) developed by Kovess and colleagues¹⁶. All these instruments are well-validated tools that can be administered by lay interviewers and produce psychiatric diagnoses according to the fourth version of the Diagnostic and Statistical Manual of Mental Health Disorders published by the American Psychiatric Association.¹⁷

A unique feature of this study was that we assessed youth residential status on a day-to-day basis. This is different from previously published studies where youth were asked to indicate all settings they had lived in within longer periods (3 months or more). This methodological choice enabled us to perform statistical analyses at the level of single days, which also allowed us to examine trajectories based on different definitions of residential stability.^{7, 18} To document residential status day-by-day since the previous interview (or during the 3 months prior to intake interview), we developed a questionnaire based on the “life history calendar” technique¹⁹ and the residential follow-back calendar designed by the New Hampshire Dartmouth Research Center (1995).^{7, 18} To help youth remember where they had lived each day during the period, recent significant life events were assessed by asking the participants if they had experienced any of 33 positive or negative life events in the previous 3 months or since the last interview (for example, broken ties with family, serious illness, drug overdose, traveling, new job, and pregnancy). This information was then noted on a calendar used to document the participant’s sleeping arrangements/locations on a daily basis, for the whole time period. A test-retest of the reliability of this tool was conducted with 30 participants who were met twice, at a 2-week interval.²⁰ The concordance observed on a daily basis over the common period was satisfactory (first quartile, 65 %; median, 80 %; third quartile, 89 %), and a kappa coefficient of 0.74 was obtained for reliability of data on residential stability during this period (0.75 is considered excellent). More concretely, residential status was determined for each follow-up day, starting on the first day after recruitment (referred to as Day 1). Each follow-up day was then classified as a homeless day or a housed day. For example, Day 1 was considered a housed day if, on that day, a youth resided (1) in his or her own home; (2) in his or her partner’s home; (3) with his or her parents; (4) with relatives, friends, acquaintances, or families of friends (not simply as an emergency measure); (5) in housing resources (excluding emergency or short-term shelters); (6) in a camp ground, hotel, or motel (not as an emergency measure); or (7) in a place where a

person works and lives (e.g., farm, fairground). Youth spending a day in transitional facilities such as a police station, jail, prison, correctional halfway house, hospital, detoxification or rehabilitation center, or other similar resources were considered as housed on these days if these stays had been preceded by housed days; otherwise, these days were considered as homeless days. Further details about our research methodology and study instruments have been previously described.²⁰ Ethical approval of our research protocol was provided by Le comité d'éthique de la recherche en santé chez l'humain du Centre hospitalier universitaire de Sherbrooke et de l'Université de Sherbrooke.

Analyses

Statistical analyses included an estimate of response rates at each follow-up questionnaire and a description of baseline characteristics of study subjects. Since no standard definition of residential stability is recognized in the literature, we used two concepts that represent a broad range of scenarios, namely, residential status on a day-to-day basis and residential status over 90-day periods. The latter period was considered sufficiently long to represent stability and is comparable to definitions used in the most recent literature.¹³ For the 90-day analyses, all study periods (period 1: follow-up days 1–90, period 2: days 91–180, etc.) were categorized as housed (90 housed days) or not housed (0–89 housed days). Numbers of participants achieving at least one housed day and those achieving at least one period of 90 consecutive housed days were calculated for each baseline characteristic. Life-table probabilities of reaching at least one housed day and 90 consecutive days were also estimated, using the Kaplan–Meier method.

Latent class growth analysis was used to identify distinct residential trajectories²¹. Again, the data were studied in two ways: day-by-day and for 90-day follow-up intervals. For the latter, we present analyses in which the outcome variable for a given time interval was continuous number of housed days rather than a dichotomous (housed vs not housed) outcome. The number of trajectories to be retained in the final models was identified by allowing two to six trajectories to be fitted to the data with linear, quadratic, and cubic temporal trends. Choice of the optimal model was based on the Bayesian information criterion. Posterior probabilities of group membership had to be larger than 0.70, and the actual prevalence of group members had to be close to the predicted value. Finally, we did not include trajectories representing less than 5 % of study subjects. Trajectories were analyzed using single-day housing status and 90-day intervals characterized by continuous number of housed days.

To explore characteristics of street youth achieving residential stability, we determined correlates of housing trajectories with the 90-day data. We conducted univariate analyses considering all variables measured at baseline. Variables with *p* values less than 0.20 for at least one of the comparisons were then retained for multivariate analyses. All analyses were conducted using statistical analysis software (SAS) version 9.1. The SAS TRAJ procedure was used for the trajectory analyses.

RESULTS

We estimated an 86 % of participation rate based on the number of eligible youth who showed up to the baseline interview appointment during the first 4 weeks of the study period. Our final sample included 419 youth, 365 (87 %) of whom completed at least one follow-up questionnaire. Table 1 describes response rates for each

TABLE 1 Response rates

Questionnaire	Subjects completing interviews, <i>n</i> (%)	Months since Q0, median (minimum, maximum)
Q0 (baseline)	419 (100)	–
Q1	365 (87)	3.0 (2.5, 12.5)
Q2	338 (81)	6.1 (4.9, 18.4)
Q3	320 (76)	9.3 (7.8, 20.2)
Q4	303 (72)	12.3 (10.4, 26.7)
Q5	258 (62)	15.4 (12.9, 26.3)
Q6	189 (45)	18.3 (15.7, 25.5)

follow-up questionnaire. Median interview dates occurred as planned in our study protocol, at six 3-month intervals. However, we observed broad heterogeneity in actual interview dates. For example, for questionnaire 4, some subjects were interviewed more than 26 months after baseline. These delays in planned interview dates provided opportunities to record data on longer follow-up intervals, as subjects could be asked to provide housing information for periods longer than the 18 months foreseen in our original study protocol. On the other hand, data obtained from these delayed interviews were possibly less precise. As a compromise, we included all available data up to 21 months of follow-up. The 365 study participants therefore provided an average of 515 days of follow-up (minimum 81, maximum 630), for a grand total of 187,971 days.

Table 2 summarizes the characteristics of the 365 subjects at baseline. Most were men (79 %), Canadian-born (91 %), and French-speaking (87 %). Mean age at study entry was 21.9 years. At baseline, participants reported having been homeless during their lives (not necessarily continuously) for an average of 2.7 years. Mean age at first homelessness episode was 16.2 years. In all, 145 subjects presented mental health problems, including 103 subjects with anxiety disorders (37 with panic disorder, 42 with generalized anxiety disorder, and 79 with phobia), 82 with affective disorders (60 with major depression, 20 with bipolar disease, and 8 with dysthymia), and 9 with psychosis. As shown in Table 2, during the course of follow-up, 342 subjects were housed for at least 1 day, and 250 subjects achieved at least one 90-day episode.

Figure 1 shows the life-table probabilities of reaching one housed day and 90 housed days, respectively. Over the 21-month follow-up interval, the life-table probabilities of reaching at least one housed day and 90 consecutive housed days were 93.7 % and 69.6 %, respectively. Interestingly, most youth reached at least one housed day soon after study entry, with close to 80 % reporting at least one housed day after 100 days of follow-up. On the other hand, approximately a third of youth never reached significant stability as measured with 90-day periods.

Figures 2 and 3 present expected residential trajectories using single days and 90-day intervals, respectively. Five trajectories are distinguished in Fig. 2 (single days), including a group with a very low probability of housing (group 1, slow stabilization), a group with a gradually increasing probability (group 2, intermediate pattern), groups with more rapidly increasing probabilities (group 3, rapid stabilization, and group 4, immediate stabilization), and a group with a fluctuating pattern (group 5, fluctuating pattern). Results for 90-day intervals were simpler (Fig. 3), showing one group with very low probability of housing (group 1, chronic

TABLE 2 Baseline characteristics of study subjects and numbers achieving at least one housed day and at least one period of 90 days

Baseline characteristics	Number of subjects (%)	Subjects achieving	
		1 day	90 days
All subjects	365 (100)	342	250
Men	289 (79)	269	193
Women	76 (21)	73	57
Age			
18–21 years	177 (48)	169	117
22–25 years	188 (52)	173	133
Born in Canada			
Yes	332 (91)	313	231
No	33 (9)	29	19
Education			
Less than high school	277 (76)	260	191
High school or more	88 (24)	82	59
Age at first homelessness episode			
7–15 years	140 (38)	130	87
16–24 years	225 (62)	212	163
Cumulative homelessness (lifetime)			
<6 months	58 (16)	55	41
6–11 months	44 (12)	42	33
12–23 months	53 (15)	53	36
24 months–14 years	210 (58)	192	140
Alcohol abuse or dependence (last 12 months)			
Yes	122 (33)	116	83
No	243 (67)	226	167
Drug abuse or dependence (last 12 months)			
Yes	237 (65)	224	157
No	128 (35)	118	93
Mental health problems (last 12 months) ^a			
Yes	145 (40)	141	101
No	219 (60)	200	148

^aThe variable *Mental health problems* excluded alcohol abuse or dependence, and substance abuse or dependence

precarity), a group with rapidly increasing probability (group 3, rapid stabilization), and an intermediate group (group 2, intermediate pattern).

Results of univariate and multivariate analyses exploring the correlates of residential stability are presented in Table 3. The final multivariate model includes only variables significant at the 0.05 level. Youth who had a high school degree at baseline were six times more likely to follow a progressive (trajectory 2 vs 1: OR=6.54) or rapid housing trajectory (trajectory 3 vs 1: OR=5.78) than those who had not completed high school. Those who had a mental health disorder were three times more likely to follow these trajectories (OR=3.16 and 3.05, respectively). However, having a substance use disorder and being born outside Canada were negatively associated with favorable outcomes. As shown by the odd ratios, there was a 68–73 % decreased probability of reaching stability among youth experiencing a substance use disorder and a 79–84 % decreased probability of reaching stability among youth who were born outside Canada.

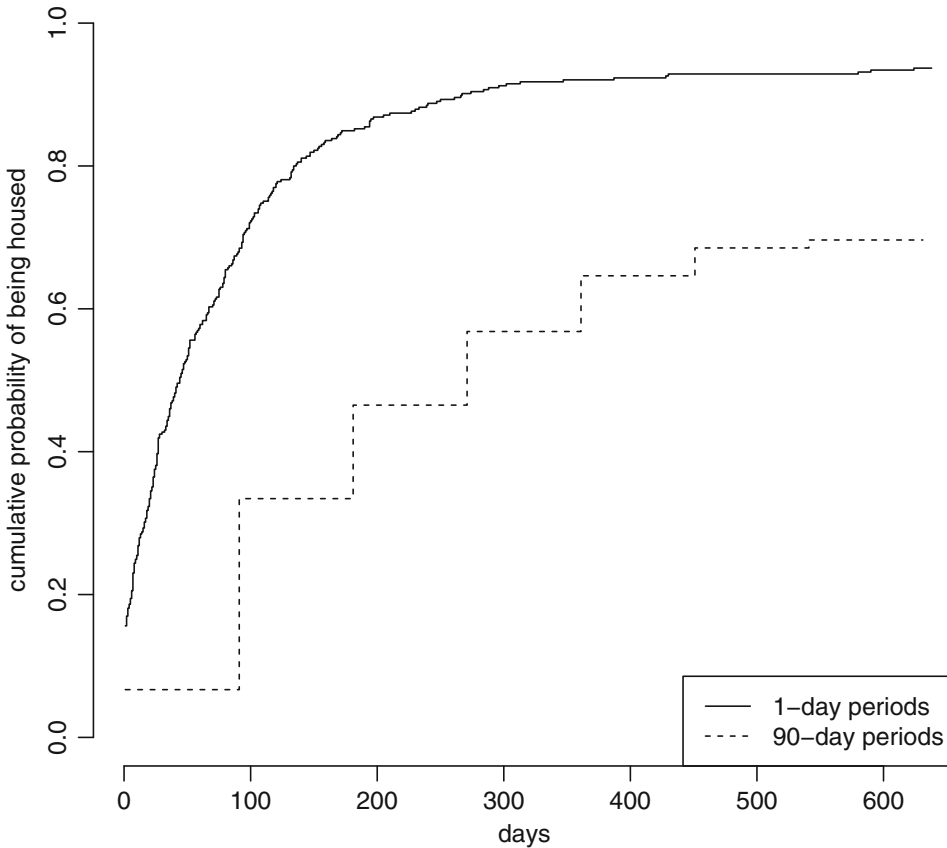


FIG. 1 Life-table probabilities of reaching at least one housed day and 90 housed days, respectively

DISCUSSION

This is the first prospective cohort study of the residential trajectories of homeless young adults in Canada. One important finding is that the observed housing trajectories are heterogeneous. According to our analysis using day-by-day data, some trajectories correspond to relatively low probabilities of being housed at least 1 day; such a trajectory can be either persistent or of variable duration including periods of improvement and deterioration. However, most youth follow a course of consistent improvement, where the probability of being housed increases either progressively or rapidly from an initial low or moderate probability of being housed at study entry. Results pertaining to achieving residential stability, this time defined according to number of days housed per 90-day period, indicate three different trajectories: the probability that a young person sees his or her residential status stabilize quickly and consistently during follow-up is 50 % (50.8 %); the probability of seeing the situation improve more progressively is just over a third (39.3 %); and the probability of experiencing a trajectory of chronic absolute homelessness is relatively low, about 10 % (9.8 %).

We identified only two other cohort studies that examined prospectively the residential trajectories of street youth including young adults and providing at least 12 months of follow-up time.^{10, 13} Both were carried out in the USA. It is difficult to

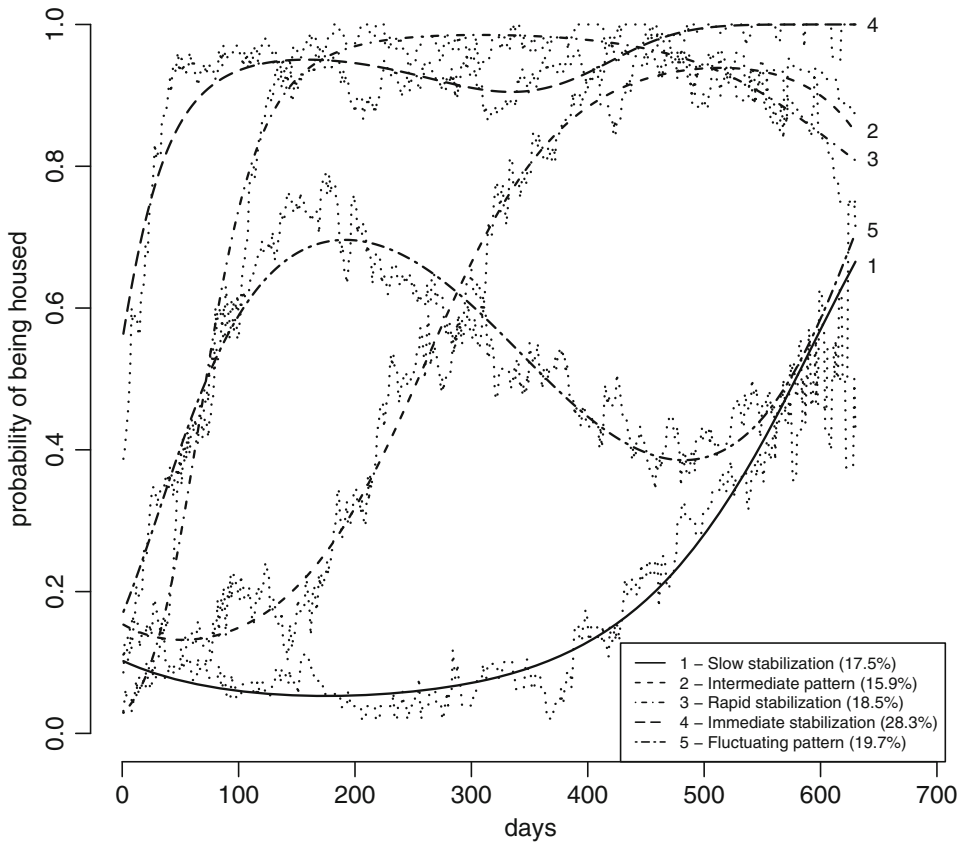


FIG. 2 Housing trajectories defined on the basis of single days

compare our results to those of these studies, especially because of methodological differences (different definitions of “homelessness” and of “residential stability” as well as differences in age groups, data collection, and analysis tools). Nonetheless, the exercise is interesting. In our study, using the Kaplan–Meier method, we estimated the proportions of youth returning to housed status for at least 1 day and for 90 consecutive days, respectively, during a 21-month period. This differs from Slesnick et al.,¹⁰ who estimated the average percent days of street youth being housed over a 12-month period (30 %) across all subjects and all time points.

Using latent class growth analysis, we were able to identify distinct residential trajectories. In a similar analysis, though based on 3-month interval assessments rather than daily reports, Tevendale et al.¹³ followed 391 homeless youth, including young adults (aged 14–24), living in Los Angeles County. Forty-two percent (184 subjects) completed all follow-up interviews (average age 19.5 years). Three housing trajectories were identified over a 2-year period: 41.4 % of the subjects were considered as consistently sheltered over the 2-year interval; 20 % were classified as short-term inconsistently sheltered, that is, with a high probability of finding and maintaining shelter over time; and 38.6 % were classified as long-term inconsistently sheltered (had a lower probability of finding and maintaining shelter over time). When comparing the results of both studies, we see that the consistently sheltered group is similar to the group of youth in our study who improved rapidly. In our

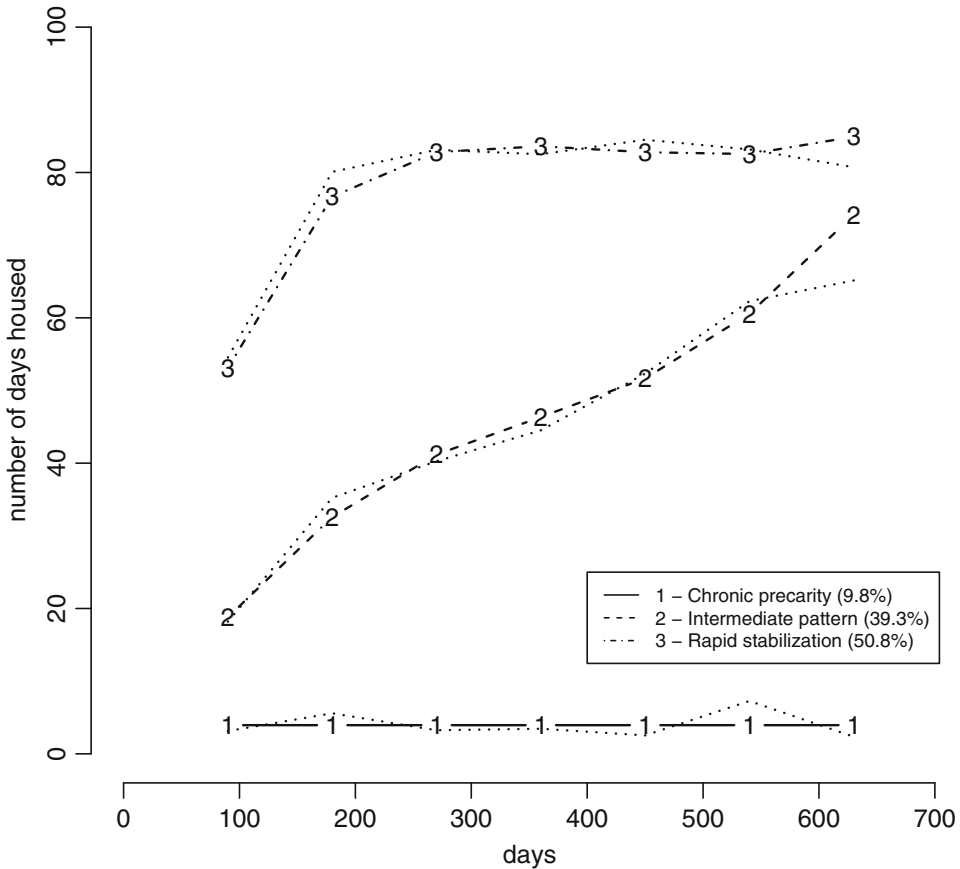


FIG. 3 Housing trajectories defined on the basis of 90-day intervals

sample, youth whose situations improved more slowly (39 % of the sample) could correspond to the group of long-term inconsistently sheltered, and probability values are very similar. However, no young people were consistently homeless during follow-up in the Los Angeles study, but 10 % were in our sample. Several factors can explain this difference, particularly the fact that youth participating in the Montréal study had longer histories of homelessness at study entry than Los Angeles youth (73 % in Montréal vs 53 % in Los Angeles).

At study entry, youth struggling with drug abuse or dependence tended to remain homeless during follow-up and had fewer chances of exiting homelessness. This result converges with those of Tevendale et al.,¹³ who found that “not using drugs” predicted membership in the consistently sheltered group. The literature indicates a complex link between homelessness and drug use behaviors²². Through qualitative studies, researchers have demonstrated that drug problems interfere with motivation to leave the streets, hinder employability, and drain financial resources^{23, 24}. Other studies suggest that the fact of living in the street increases risks of problematic consumption, especially because of increased exposure to drugs and normalized drug use. Drug abuse among street youth is part of a process of adapting to suffering and to a subculture^{25, 26}. Finally, we should underline that most studies looking at the link between homelessness and “substance use” consider drug use to be a risk behavior and not necessarily a disorder, in a diagnostic sense. Yet, “using drugs” (or

TABLE 3 Correlates of housing trajectories; continuous definition of 90-day housing

Characteristic	Intermediate pattern versus chronic precarity		Rapid stabilization versus chronic precarity	
	Odds ratio	<i>p</i> value	Odds ratio	<i>p</i> value
Univariate analyses (<i>p</i> values<0.20)				
Men	0.65	0.48	0.41	0.13
Born outside Canada (yes)	0.26	0.04	0.33	0.049
High school or more (yes)	4.40	0.10	3.93	0.11
Age at first homelessness episode (≥16 years old)	1.17	0.72	1.91	0.10
Cumulative homelessness (≥1 year)	0.82	0.71	0.41	0.08
Alcohol abuse or dependence (yes)	3.03	0.03	2.59	0.05
Drug abuse or dependence (yes)	0.32	0.03	0.39	0.06
Mental health problems (yes)	3.02	0.03	2.92	0.02
Multivariate analyses (<i>p</i> values<0.05)				
High school or more (yes)	6.54	0.049	5.78	0.06
Born outside Canada (yes)	0.16	0.01	0.21	0.01
Drug abuse or dependence (yes)	0.27	0.02	0.32	0.04
Mental health problems (yes)	3.16	0.03	3.05	0.02

any other drug-related behaviors) and suffering from a substance use disorder are not the same, conceptually. Future studies should investigate this issue.

Effects of mental health problems on residential stability of homeless young adults are poorly documented. To our knowledge, no studies have established a clear relationship between mental disorders and exit of homelessness, even among older homeless adults. Measures of mental health varied from one study to another, and none has specifically examined anxiety or depressive disorders.^{6, 27, 28} In the study by Slesnick et al., the number of mental health problems among homeless youth was not a significant predictor of changes in homelessness during follow-up. However, in our study, there was a positive association between having mental health problems and reaching residential stability. The mental health problems afflicting the youth in our sample were mostly anxiety disorder and depression. It is plausible that the nature of the problem is more important than the number. There is agreement in the literature that difficult life conditions associated with homelessness might exacerbate mental health problems.²⁹ Youth presenting with anxiety or depressive disorders, especially when drug-related disorders are absent, might not consider street life as “normal”; they might not integrate value systems and norms of the street subculture and may be less entrenched in street life. Zlotnick et al.²⁷ showed that social affiliation is positively associated with exit from homelessness, when drug-related disorders are absent. It is plausible that youth who have anxiety or depressive disorders, are more willing to seek help to exit street life, accept housing assistance or maintain residential stability when they have access to housing. This hypothesis deserves more research as it could give interesting indications for intervention.

Although no prospective studies have looked at the link between level of education and trajectory of homelessness, the results were as expected: having a personal background that fosters social integration is certainly a lever for exiting

homelessness.³⁰ Young people who drop out of school at an early age are generally less likely to get regular jobs and more likely to rely on illegal and quasilegal forms of making money, including prostitution.³¹ As for the link observed between country of birth and residential stability, our study cannot explain the more favorable housing trajectories of young people born in Canada. Youth born outside the country (39) were from 26 different countries, including nine African countries ($n=10$), six European countries ($n=7$), six Central or South American countries ($n=6$), four West Indian or Caribbean countries ($n=11$), and the USA ($n=5$). Cultural differences may be involved. Indeed, studies conducted among youth have shown that factors leading to homelessness and street survival strategies differ among youth of varied ethnic backgrounds.^{11, 32}

There are strengths and limits to this study. Mental health variables, including substance use and dependence, were assessed with standardized validated questionnaires. Furthermore, the instrument used for our cohort was adapted from the residential follow-back calendar designed by the New Hampshire Dartmouth Research Center¹⁸. Tsemberis et al.⁷ assessed the psychometric properties of this calendar and demonstrated its high test-retest reliability, sensitivity to change, and concurrent validity. A unique feature of our study is that we adapted this method to permit assessment of youth's housing status on a daily basis, which provided flexibility for the analyses. In terms of limitations, our data collection method was based on self-reports, which may have introduced the possibility of both recall and social desirability biases. We believe that the impact of such biases was limited by our use of the life history calendar technique, the short time spans between interviews (3 months), and the interviewers' open and nonjudgmental attitudes. Second, our results may not be generalizable to all street youth, particularly female street youth, who accounted for only 21 % of the sample. However, these statistics are not surprising because they correspond to figures observed in other adult street-based populations in our region.³³ Multicenter studies are needed to recruit sufficient numbers of young street-involved female adults and achieve better representation of this vulnerable population. Finally, following homeless populations can be particularly challenging. In our study, 87 % of subjects recruited at baseline were reinterviewed at 3 months, 72 % at 12 months, and 45 % at 18 months. These figures are comparable to that of Tevendale et al.,¹³ who reported a 2-year follow-up percentage of 42 %, similar to ours. Losses to follow-up may have affected our estimates of housing trajectories, especially after 12 months of follow-up. On one hand, it is plausible that subjects who stabilized for long periods dropped out of our study more frequently than less stable youth, leading to deflated housing stability estimates. On the other hand, it is conceivable that subjects who did not stabilize were more likely to be lost to follow-up due to chaotic lifestyles that jeopardized their continued participation. It is less clear that the correlate analysis would be biased. To affect the magnitude or direction of odds ratio estimates, dropout rates would have to differ according to the presence of both a correlate and housing stability.³⁴

In conclusion, the results of this study are encouraging in that most homeless youth achieve residential stability even after relatively long stays in the street. The diversity of trajectories suggests that a variety of more or less intensive housing support programs should be provided to meet the needs of young people. These results should prompt public health authorities to plan services well adapted to this specific population. Maximum efforts should be made to prevent chronic homelessness among youth. In this perspective, substance use disorders should be detected and managed as early as possible.

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