

Geriatric Homelessness: Association with Emergency Department Utilization



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DOI: <http://dx.doi.org/10.5770/cgj.19.253>

ABSTRACT

Background

Homeless adults frequently use emergency departments (EDs), yet previous studies investigating ED utilization by the older segment received little attention. This study sought to characterize older homeless adults who utilized local urban EDs.

Methods

ED encounters at three hospitals in Hamilton (Ont.) were analyzed, and demographic and clinical characteristics of the older homeless (age > 50) vs. younger counterparts (age ≤ 50) were compared during a 24-month period.

Results

Of all adults, 1,330 were homeless, of whom 66% were above age 50. Older homeless adults sought less acute care within 30 days from an index visit compared with their younger counterparts. Non-acute illnesses constituted only 18% of triaged cases. Older homeless women with access to a primary care physician (PCP) were 3.3 times more likely to return to ED within 30 days, whereas older homeless men (irrespective of PCP access) were less likely to return to ED.

Conclusions

Despite high homeless patient acuity, a lesser number of ED visits with increasing age remains concerning because of previously reported high morbidity and mortality rates. Access to primary care may not be enough to reduce ED utilization. Further research is needed to evaluate acute care interventions

and their effectiveness in ED, and to identify homeless patients requiring more targeted services.

Key words: aging, geriatric homelessness, emergency department utilization, hospital utilization

INTRODUCTION

Studies have shown that homeless adults experience high disease burden and mortality rates,⁽¹⁾ are frequent ED users,⁽²⁾ and have high health care expenditures.⁽³⁾ Because the Canadian population is aging, there is a proportionate rise in the population of aging homeless adults, likely resulting in increased hospital utilization. Homeless adults also have poor access to primary care physicians (PCPs), resulting in increased use of hospitals for episodic care that would otherwise be accomplished in a PCP office.⁽⁴⁾ By extrapolation, homeless adults with access to primary care would hypothetically have a lower magnitude of frequent ED visits compared to homeless adults with no access to primary care.

Homeless adults are considered physiologically “old” at age 50, even though they are not classified as “geriatric” in the conventional, demographic sense.⁽⁵⁾ The prevalence of homelessness in older adults is difficult to determine. Nonetheless, they present a concerning group as they are marginalized, in generally poor health for their age, and proportionately consume higher health-care resources due to chronic and complicated health problems and a lack of age appropriate community services that together lead to negative outcomes.⁽⁶⁾ As they age, homeless adults are considerably more vulnerable to the unforgiving environmental and social conditions of “life on the street”.⁽⁷⁾ A recent population-based study from homeless shelters in Oakland, California, has shown that homeless adults in their 50s have more geriatric conditions amenable to treatment than those two decades

older who are stably housed.⁽⁸⁾ It is evident that services that address geriatric conditions are needed for older homeless adults living across diverse environments such as homeless shelter or hotel, or those living transiently with family/friends.

One impediment to caring for homeless persons in the Canadian universal health-care system has been the financial disincentives for physicians.⁽⁹⁾ Encounters with homeless patients may last longer than an average visit because of the complexity of their bio-psychosocial problems.⁽⁹⁾ Not surprisingly, Hwang *et al.*⁽¹⁰⁾ have shown that physicians were reimbursed for about half of the clinical encounters for homeless individuals, which suggests a need for special arrangements for physician remuneration.

Although the contemporary Canadian physician is moving toward an alternate form of payment plan, in a primarily fee-for-service system, the delivery of care to this vulnerable group may be problematic due to the high proportion of patients without valid health insurance, as well as other administrative logistical barriers,^(9,10) thus making the ED a more accessible and navigable care location instead of the conventional primary care system.⁽¹¹⁾ Specifically, some homeless older adults utilize the ED for routine care as they have difficulty with the logistics required to access and/or following through on scheduled primary care appointments.⁽¹¹⁾ Logistical challenges can be as simple as the lack of a phone to make calls to PCPs and, in turn, receive communications from the provider. Although identification or “ID clinics” now exist to facilitate the acquisition and renewal of expired health insurance cards, attending the clinic can in itself pose a challenge.

The use of ED for non-acute reasons is problematic from a health services planning perspective. It is challenging for both the homeless adults and the already over-burdened hospital system. Due to the previously reported high morbidity and mortality rates in this disadvantaged group, we hypothesized that homeless adults older than age 50 were higher utilizers of ED than their younger counterparts.

METHODS

Study Setting

This was a retrospective analysis of homeless adults who presented at the three EDs in the city of Hamilton (Ont.) for the study period. The participating EDs were located at three inner city hospitals, situated within the urban downtown area, and represented by Hamilton General Hospital (HGH), Juravinski Hospital (JH), and St. Joseph’s Healthcare Hamilton (SJHH). SJHH-ED site included the city-wide psychiatric emergency services for adults.

Housing Status

Patients were categorized as “housed” versus “homeless” at the time of the ED visit during the study period of 24 months

(from January 1, 2012 to January 1, 2014). “Homeless” was defined as any patient living on the street, in a homeless or temporary shelter, or whose housing status was “other” or “unknown.” Provincial codes denoting persons of no fixed address were utilized as search strings to identify homeless ED users.

Inclusion Criteria

The criteria for inclusion was that subjects be aged 18 years or older, were homeless at the time of their index ED visit, and had at least one ED visit at one/more of the three ED centres during the study period. All patients selected for the study had an index ED care visit occurring within the study period.

Data Sources

We used electronic medical records (EMRs) and the electronic database National Ambulatory Care Reporting System (NACRS) administrative database to access information on visits to EDs at three academic urban hospitals. All patient information was de-identified by a neutral mediator. The information of interest was aggregate level data. The following information was abstracted: demographic information, total number of ED visits, total number of ED visits by adults of no-housing status, access to a PCP, existence of home address vs. no-housing status, health characteristics (including psychiatric disorders) as determined by the reason for visit and other diagnoses, and resource intensity weight (RIW) score used as a proxy to determine the degree of resource utilization and medical acuity of ED visits by the population of interest. This study was approved by the McMaster University (the academic affiliate of all three medical centres) institutional ethics review board. Ethics review board determined that patient consent was not required for the study.

Outcome Variables

The primary outcome was ED utilization as defined by frequency of ED visits within a 30-day period. For this study, “frequent” ED visits were defined as two or more ED visits occurring within 30 days following the index ED care encounter. Secondary outcomes included clinical and demographic correlates of the population of interest.

Statistical Analysis

Descriptive analyses generating means and standard error of the mean (SEM) for continuous data and proportions for categorical data were conducted. The significance level was determined to be $p < .05$. Population was stratified by sex and age categories, RIW score, and access to a PCP, and means were compared across these categories using ANOVA; the analyses also compared age groups (age ≤ 50 years vs. age > 50 years). To analyze the overall disease severity and medical

acuity in these homeless patients, we used RIW index. In the Canadian medical system, each patient that accesses hospital care has a RIW assigned to it. The RIW value is derived from an algorithm that considers and assigns a “weight” to all of the patient’s discharge diagnoses for overall medical/surgical complexity.⁽¹²⁾ Higher RIW numbers indicate a more complex and resource intensive patient, suggesting a more “medically/surgically ill” patient. All of these statistical analyses were done using SAS version 9.4 (SAS Institute Inc., Cary, NC).

RESULTS

Description of Older Homeless Adult Patients Vs. Younger Counterparts

Table 1 describes the overall study population of 1,330 homeless adults (aged ≥ 18 years) who received acute care at the three major Hamilton-based urban ED sites, with the population stratified into two age groups: older (> 50 years) and younger (≤ 50 years) patients. In this sample, 66% were

older than age 50, of which 20% were females. Psychiatric diagnoses as the most responsible diagnoses for their ED encounters, including neurocognitive and alcohol use disorders, were found in 28% of homeless patients. Repeat visit to the ED within a 30-day period from their index visit occurred in 22% of cases. The ED triage protocol of the study subjects included resuscitation (3%), emergent (20%), urgent (58%), less urgent (15%), and non-urgent (3%) cases. Main effects of ANOVA analysis revealed that the RIW score and patient age both differed by age ($p = .013, p < .0001$, respectively), sex ($p = .014, p = .004$, respectively) and the interaction of both main effects ($p = .033, p = .0003$, respectively). This analysis also revealed that the number of visits differed slightly by both age and sex, but was not associated with an interaction effect.

Linear Probability Model

Computer-generated linear regression model in age and sex stratified population revealed that in women younger than age 50 ($n = 81$) disposition (namely, discharge and leaving the ED

TABLE 1.
ANOVA across population with main effects of stratifications (data reported as ± SEM unless otherwise stated)

Variable	≤ 50 yr		> 50 yr		Main Effects		
	F	M	F	M	Age	Sex	Interaction
RIW	0.06±0.0015	0.061±0.003	0.07±0.003	0.06±0.002	0.0137	0.0148	0.0337
Age (yr)	36.9±1.3	41.1±0.45	60.6±0.59	60.0±0.33	< 0.0001	0.0043	0.0003
Number of Visits	4.3±0.39	6.8±0.39	3.9±0.26	5.2±0.17	0.0004	< 0.0001	NS
Categoricals (%)	F	M	Total				
<i>Site</i>							
St. Joseph's	58	49	52				
Hamilton General	32	46	43				
Juravinski	10	5	5				
<i>Triage</i>							
Resuscitation	3	3	3				
Emergent	17	21	20				
Urgent	67	56	58				
Less Urgent	10	16	15				
Non-Urgent	2	4	3				
<i>Age Category</i>							
≤ 50	30	34	33				
> 50	70	66	66				
<i>Psychiatric Dx</i>							
N	78	71	72				
Y	22	29	28				
<i>30-day Return</i>							
N	81	77	78				
Y	19	23	22				
<i>Sex</i>							
M			80				
F			20				

vs. admission status) positively associated with RIW score. In men younger than age 50 ($n = 359$) disposition positively, while 30-day ED return negatively associated with RIW score. In women above age 50 ($n = 188$) disposition positively, while 30-day ED return negatively associated with RIW score. In men above age 50 ($n = 694$) disposition and age positively, while 30-day ED return and number of visits negatively associated with RIW score (Table 1).

Logistic Probability Model

Logistic regression revealed that appearing at SJHH-ED site (OR 0.655; 95% CI 0.501–0.856) and being older than age 50 (OR 0.635; 95% CI 0.469–0.861) both decreased the odds of these patients returning to that same ER within 30 days of their index ED visit (Table 2). Specifically, as we moved from HGH site and JH site to SJHH site, there was a lower likelihood that homeless patients would return to ED within 30 days. Conversely, logistic regression model in age and sex stratified population revealed that women older than age 50 ($n = 188$) with access to a PCP were 3.3 times more likely to return to their ED within a 30-day period (OR 3.29, 95% CI 1.21–8.94) (Table 3), while men older than age 50 (irrespective of PCP access) were less likely to return to SJHH-ED vs. the remaining ED sites. The logistic model always contained site, age category, sex, number of visits, ED disposition, PCP access, and psychiatric disorders.

DISCUSSION

In our study, two-thirds of homeless patients presenting to the ED sites were older than age 50. However, the older homeless group was associated with less frequent ED use within a 30-day period compared with their younger counterparts. Being older than age 50 also indicated a lesser likelihood to return to SJHH-ED vs. HGH and JH sites. HGH and JH locations have ED sites primarily specializing in medical or surgical services,

whereas SJHH-ED provides additional city-wide emergency psychiatric services for adults. In this view, our findings may suggest a pattern of favouring access to those EDs that offered primarily a medical/surgical acute care. These findings are remarkable, given the existing literature about older homeless patients that show increased rates of medical comorbidities, suboptimal health-care coverage and reduced access to a PCP.^(1,4) Although all three EDs were generally situated within the downtown locale, health differences and socio-economic determinants for area pockets were impossible to account for.

The universal health-care system in Canada aims to improve access, coordination of care, and outcomes for vulnerable populations. Health care must be integrated with other resources to address the complex challenges presented by inadequate housing. Prior research has shown that continuity of care with a regular PCP is associated with decreased episodic care at EDs and decreased hospital care.⁽⁴⁾ A study by Khandor *et al.*⁽⁴⁾ has shown that fewer than half of the homeless adults in a major urban centre in Ontario had a PCP. Not having a PCP was associated with increasing duration of homelessness, lack of proof of health insurance coverage, and having a chronic medical condition. Whereas women in our study represented only 20% of the homeless group, interestingly, those women older than age 50 with access to a PCP more than tripled the ED revisits within a 30-day period when compared to those women younger than age 50 and/or without access to PCP, and men. Increased efforts are needed in the hospital discharge planning to address the barriers to appropriate health care that persist in this population despite the provision of PCPs.⁽⁴⁾

In our sample, 28% had a psychiatric diagnosis including neurocognitive and alcohol related disorders. In view of high co-morbidity of psychiatric disorders in homeless patients, mental health services in primary care designed for older homeless adults are relatively underdeveloped. As shown by Watts *et al.*,⁽¹³⁾ under-recognition of psychiatric disorders, in general, in older patients at the primary care level was common. Contributory factors included: short consultation times with physicians; concentration solely on physical symptoms; few patients presenting explicitly with psychiatric problems; few decisions to treat or refer older patients with psychiatric illness; and the general practitioners tendency to monitor or defer diagnosis and treatment decisions—suggesting that planning for primary care services needs to adopt a flexible assessment model.⁽¹³⁾ Assessment for geriatric syndromes is also important as these syndromes occur at increased rates among homeless older adults⁽¹¹⁾ and many of the interventions can be effective.⁽¹⁴⁾

Alternate payment methods and adequate funding for physician compensation is essential in maintaining a better tailored and consistent service delivery program for this vulnerable population. Aging homeless adults in our sample have shown a lower likelihood of ED acute care utilization in comparison with their younger counterparts. It will be important to determine whether this is a sustained correlation or is unique to this study.

TABLE 2.
Logistic regression for 30-day ED return in the whole population
($n = 1,330$)

Variable	Point Estimate (OR)	95% Wald Confidence Limits	
Site	0.655	0.501	0.856
AGE Cat	0.635	0.469	0.861
Sex	1.175	0.826	1.670
Visits	0.989	0.965	1.013
Disposition	0.859	0.739	1.009
PCP Access	1.174	0.978	1.409
Psych Dx	1.062	0.773	1.461
A1C (Int + Cov)		1377.448	

TABLE 3.
Logistic regression for 30-day ED return in the population stratified by age and sex

Variable	≤ 50 Yr & F (n=82) ^a			≤ 50 Yr & M (n=364)		
	Point Estimate (OR)	95% Wald Confidence Limits		Point Estimate (OR)	95% Wald Confidence Limits	
Site	0.686	0.255	1.842	0.899	0.578	1.400
Visits	0.922	0.781	1.089	0.995	0.996	1.025
Disposition	1.012	0.546	1.876	0.942	0.721	1.229
PCP Access	2.254	0.455	11.173	1.266	0.915	1.752
Psych Dx	<0.001	<0.001	>999.999	0.974	0.528	1.797
AIC (Int + Cov)		90.947			466.035	
Variable	> 50 Yr & F (n=188)			> 50 Yr & M (n=696)		
	Point Estimate (OR)	95% Wald Confidence Limits		Point Estimate (OR)	95% Wald Confidence Limits	
Site	0.505	0.228	1.119	0.535	0.357	0.802
Visits	1.078	0.955	1.217	0.965	0.920	1.011
Disposition	0.585	0.362	0.949	0.872	0.678	1.122
PCP Access	3.293	1.212	8.946	0.978	0.768	1.245
Psych Dx	1.047	0.428	2.564	1.187	0.777	1.813
AIC (Int + Cov)		172.821			655.279	

^aQuasi-complete separation of data.

RIW scores showed a negative correlation with the number of ED encounters and recurrence of visits within 30 days from the index visit, suggesting that the more sick the homeless patients appeared to be, the less likely they were to return to ED for any care. In keeping with the previous research of increased morbidity and mortality rates in homeless adults,⁽¹⁾ particularly in the older homeless group, only 18% of the ED visits in our sample constituted less- and non-urgent cases, indicating that the majority of visits likely encompassed a more severe pathology. Despite this, older homeless adults were less likely to return to the ED within 30 days. Exploring pathways to enhance the liaison between EDs and existing community care teams, or to facilitate access to primary care upon hospital discharge, is crucial. As evidenced in our older female group, access to a PCP may not be enough to reduce ED utilization for acute care. Health care must be integrated with other resources to address the complex challenges presented by inadequate housing.

Our study included all the urban ED centres in the study location, and therefore likely accounted for all ED visits city wide. However, there were some limitations of this study. Due to the study's retrospective design, missing data presented an issue. We also relied on index housing status which was used as a static factor, however homelessness is often episodic, in addition to occurring along a spectrum. Despite these limitations, this study still sheds light on the demographic and access to care factors for ED visits in a homeless population.

Future research examining homeless patients' perspectives on ED utilization and barriers to utilization of primary care instead of ED would further advance the findings from this study. Identifying those most at risk for frequent ED visits (such as the younger homeless adults), as well as the most vulnerable groups at risk of inadequately accessing acute care (such as the older homeless adults) may ultimately help to identify patients requiring more targeted services. Geriatric clinicians could play a significant role in evaluating and treating this aging disadvantaged population more comprehensively.⁽¹⁵⁾ While it is generally well understood that homelessness confers a unique set of health and wellness risks, the local ED usage patterns of this population are yet to be fully elucidated. This study has added to the limited body of knowledge about the degree of local health system pressure imparted by this group, given the impending "tsunami" of aging and its concomitant impact on the health-care system.

CONCLUSION

Despite larger numbers of older compared to younger homeless adults seeking acute care in the EDs, those older sought less acute care within a 30-day period from their index ED encounter. A lower rate of repeat ED visits with increasing age remains concerning, because of previously reported high morbidity and mortality rates in this disadvantaged

population and lack of adequate access to primary care. Systems of care should devise comprehensive services that address the simultaneous medical (systemic and psychiatric), social, and logistical needs of these patients. In particular, specialized multidisciplinary teams, including geriatricians, geriatric psychiatrists, PCPs, nurses, social workers, and allied health-care professionals, can further play a significant role in evaluating and managing this vulnerable subgroup more comprehensively.

CONFLICT OF INTEREST DISCLOSURES

The authors declare that no conflicts of interest exist.

REFERENCES

1. Baggett TP, Hwang SW, O'Connell JJ, *et al.* Mortality among homeless adults in Boston: shifts in causes of death over a 15-year period. *JAMA Intern Med.* 2013;173(3):189–95.
2. Ku BS, Scott KC, Kertesz SG, *et al.* Factors associated with use of urban emergency departments by the U.S. homeless population. *Public Health Rep.* 2010;125(3):398–405.
3. Bharel M, Lin WC, Zhang J, *et al.* Health care utilization patterns of homeless individuals in Boston: preparing for Medicaid expansion under the Affordable Care Act. *Am J Public Health.* 2013;103(S2):S311–S317.
4. Khandor E, Mason K, Chambers C, *et al.* Access to primary health care among homeless adults in Toronto, Canada: results from the Street Health survey. *Open Medicine.* 2011;5(2). Available at: <http://www.openmedicine.ca/article/view/368/407>. Accessed 31 May, 2016.
5. Cohen C. Aging and homelessness. *The Gerontologist.* 1999;39(1):5–14.
6. Hahn JA, Kushel MB, Bangsberg DR, *et al.* Brief Report: the aging of the homeless population: fourteen-year trends in San Francisco. *J Gen Intern Med.* 2006;21(7):775–78.
7. Crowe C, Hardill K. Nursing research and political change: The Street Health Report. *Can Nurse.* 1993;89(1):21–24.
8. Brown RT, Hemati K, Riley ED, *et al.* Geriatric conditions in a population-based sample of older homeless adults. *The Gerontologist.* 2016;56(5). First published online February 26, 2016.
9. Lechky O. Bringing health care to the homeless. *CMAJ.* 1999;161(1):13.
10. Hwang SW, Windrim PM, Svoboda TJ, *et al.* Physician payment for the care of homeless people. *CMAJ.* 2000;163:170–71.
11. Abdurrahman A, Hategan A. Underprivileged geriatric patients: on-call intervention, bridging and recovery. In: Hategan A, Bourgeois JA, Hirsch CH, editors. *On-Call geriatric psychiatry: handbook of principles and practice.* Switzerland: Springer; 2016. p 353–62.
12. Resource Indicators: DAD Resource Intensity Weights and Expected Length of Stay [Website]. Ottawa: CIHI. Available from: http://www.cihi.ca/cihi-ext-portal/internet/en/document/standards+and+data+submission/standards/case+mix/case+mix_ri. Accessed 29 May, 2016.
13. Watts SC, Bhutani GE, Stout IH, *et al.* Mental health in older adult recipients of primary care services: is depression the key issue? Identification, treatment and the general practitioner. *Int J Geriatr Psychiatry.* 2002;17(5):427–37.
14. Brown RT, Kiely DK, Bharel M, *et al.* Geriatric syndromes in older homeless adults. *J Gen Intern Med.* 2012;27(1):16–22.
15. Stergiopoulos V, Herrmann N. Old and homeless: a review and survey of older adults who use shelters in an urban setting. *Can J Psychiatry.* 2003;48(6):374–80.

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