Use of Acute Care Services among Older Homeless Adults

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TO THE EDITOR

The median age of homeless single adults in the United States has increased from approximately 35 years in 1990 to nearly 50 years in 2010,[1] yet little is known about health care utilization among older homeless adults. Homeless adults 50 years or older have unique medical problems, including high rates of chronic illnesses and geriatric conditions.[2] A better understanding of the health care use by this vulnerable population would help to target strategies to improve their care. Thus, we prospectively followed a cohort of older homeless adults to describe and identify modifiable factors associated with emergency department (ED) visits and hospitalizations over one year.

METHODS

In 2010, we recruited 250 homeless adults from 8 shelters in Boston.[3] Eligibility criteria included age   50 years, current homelessness, and ability to communicate in English and provide informed consent. We conducted a baseline in-person assessment, and 12 months later we reviewed medical records at 10 Boston hospitals to determine the cohort's use of acute care services in the intervening year.

Baseline study variables are detailed elsewhere.[3] Data collected by interview included: demographics, comorbidities, access to health care, alcohol problems (Addiction Severity Index [ASI] score ≥0.17) and drug problems (ASI score ≥0.10).[4] We assessed common geriatric conditions by interview and physical examination, including Activities of Daily Living, Instrumental Activities of Daily Living, falls in the prior year, global cognitive impairment (Mini-Mental State Examination score <24),[5] and executive dysfunction, defined as a Trail Making Test Part B duration >1.5 standard deviations above population-based norms, or as stopping the test early.[6] We also assessed frailty (Fried criteria),[7] major depression (9-item Patient Health Questionnaire score ≥10),[8] and sensory impairment, defined as self-reported difficulty hearing despite using a hearing aid, self-reported difficulty seeing despite wearing corrective lenses, or best-corrected vision >20/40.

After 12 months, investigators reviewed medical records at the 10 hospitals for each subject by name, date of birth, and social security number. If a matching medical record was found, investigators ascertained the number of ED visits and hospitalizations made by that subject in the prior 12 months.

Multivariable logistic regression was used to estimate the associations between baseline characteristics and 2 outcomes at 12 months: 1. ≥4 ED visits and 2. ≥1 hospitalizations. Adjusted models included age, sex, and variables associated with the outcomes in bivariable analyses at a P value <.10. We conducted analyses using SAS version 9.2 (SAS Institute, Cary, North Carolina).

RESULTS

The subjects' mean age was 56.2 years, 19.2% were female, and 40.0% were White (Table 1). After 12 months, 64.6% of subjects had ≥1 ED visits (range, 0–112), and 28.4% had ≥4 ED visits; the subjects who made ≥4 ED visits accounted for 86.2% of all ED visits made by the cohort (eTable). In multivariable analysis, the following characteristics were significantly associated with ≥4 ED visits: female (adjusted odds ratio [AOR], 2.9 [95% confidence interval (CI) 1.2–6.6]); White (AOR, 2.6 [95% CI, 1.3–5.4]); no usual source of primary care (AOR, 2.5 [95% CI, 1.2–5.3]); ≥1 outpatient visits during the past year (AOR, 6.5 [95% CI, 1.2–34.4]); alcohol problem (AOR, 2.8 [95% CI, 1.2–6.5]); ≥1 falls during the prior year (AOR, 2.9 [95% CI, 1.4–6.3]); executive dysfunction (AOR, 2.8 [95% CI, 1.3–5.8]); and sensory impairment (AOR, 3.1 [95% CI, 1.4–6.9]).

One-third of subjects (33.6%) were hospitalized over 12 months (range, 0–38 hospitalizations). In multivariable analysis, the following characteristics were significantly associated with ≥1 hospitalizations (Table 2): older age (AOR, 1.4 [95% CI, 1.1–1.8]); White (AOR, 1.8 [95% CI, 1.0–3.4]); unable to see a health care provider when needed (AOR, 2.1 [95% CI, 1.0–4.6]); ≥1 clinic visits during the past year (AOR, 6.8 [95% CI, 1.5–30.2]); and sensory impairment (AOR, 2.0 [95% CI, 1.1–3.7]).

COMMENT

This prospective study demonstrated that ED visits and hospitalizations are common among older homeless adults. Several modifiable factors were associated with greater use of acute care, including alcohol problems, prior falls, and sensory impairment. In prior work, housing interventions have been shown to decrease acute care use among subgroups of homeless persons.[9] Our results suggest that in programs servicing the older homeless, counseling on substance use, addressing risk factors for falls, and facilitating access to glasses or hearing aids may help avoid a substantial number of ED visits and hospitalizations.

The study has several limitations. We may not have captured all ED visits or hospitalizations, particularly if they occurred outside Boston. Moreover, because the study was conducted in Massachusetts, a state with universal health insurance, our results may not be generalizable to other states.

Providing primary care to older patients living in the street or a shelter is challenging. Focusing limited resources on targeting modifiable factors, including alcohol problems and common geriatric conditions, may lower rates of burdensome and costly acute care use in this vulnerable population.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

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Table 1

Predictors of frequent emergency department visits over 12 months among 250 older homeless subjects

Baseline characteristics	All subjects (n=250)	<4 ED visits (n=179)	4 ED visits (n=71)	Odds ratio for 4 ED visits (95% confidence interval)	
				Unadjusted	Adjusted[b]
Age, mean years (standard deviation)[a]	56.2 (5.3)	56.2 (5.1)	56.2 (5.9)	1.0 (0.8–1.2)	0.9 (0.7–1.3)
Female, No. (%)	48 (19.2)	31 (17.3)	17 (23.9)	1.5 (0.8–2.9)	2.9 (1.2–6.6)
White, No. (%)	100 (40.0)	65 (36.3)	35 (49.3)	1.7 (1.0–3.0)	2.6 (1.3–5.4)
Less than high school education, No. (%)	65 (26.2)	40 (22.5)	25 (35.7)	1.9 (1.1–3.5)	2.1 (1.0–4.6)
Primary language other than English, No. (%)	33 (13.2)	23 (12.9)	10 (14.1)	0.9 (0.4–2.0)	
Insured, No. (%)	234 (93.6)	165 (93.2)	69 (98.6)	5.0 (0.6–39.3)	
Lacks a usual source of health care, No. (%)	71 (29.2)	43 (24.6)	28 (41.2)	2.1 (1.2–3.9)	2.5 (1.2–5.3)
Unable to see a health care provider when needed, No. (%)	40 (16.1)	25 (14.0)	15 (21.4)	1.7 (0.8–3.4)	
1 outpatient clinic visits during the past year, No. (%)	216 (86.4)	150 (83.8)	66 (93.0)	2.6 (0.9–6.9)	6.5 (1.2–34.4)
Comorbidities, No. (%)					
Coronary heart disease	33 (13.3)	21 (11.8)	12 (17.1)	1.5 (0.7–3.3)	
Diabetes mellitus	40 (16.2)	27 (15.3)	13 (18.6)	1.3 (0.6–2.6)	
Stroke	17 (6.9)	10 (5.6)	7 (10.0)	1.9 (0.7–5.1)	
Hypertension	147 (59.5)	100 (56.5)	47 (67.1)	1.6 (0.9–2.8)	
Pulmonary disease	78 (31.5)	52 (29.2)	26 (37.1)	1.4 (0.8–2.6)	
Alcohol problem, No. (%)[c]	46 (18.9)	25 (14.3)	21 (30.4)	2.6 (1.4–5.1)	2.8 (1.2–6.5)
Drug problem, No. (%)[d]	42 (17.0)	26 (14.7)	16 (22.9)	1.7 (0.9–3.5)	
Geriatric conditions, No. (%)					
ADL impairment[e]	74 (29.6)	46 (25.7)	28 (39.4)	1.9 (1.1–3.4)	
IADL impairment[f]	142 (57.3)	99 (55.9)	43 (60.6)	1.2 (0.7–2.1)	
1 falls during the past year	133 (53.4)	82 (45.8)	51 (72.9)	3.2 (1.7–5.8)	2.9 (1.4–6.3)
MMSE impairment[g]	61 (24.5)	37 (20.7)	24 (34.3)	2.0 (1.1–3.7)	
TMT-B impairment[h]	73 (30.0)	43 (24.4)	30 (44.8)	2.5 (1.4–4.5)	2.8 (1.3–5.8)
Frailty[i]	40 (16.2)	25 (14.0)	15 (21.7)	1.7 (0.8–3.5)	

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Baseline characteristics	All subjects (n=250)	<4 ED visits (n=179)	4 ED visits (n=71)	Odds ratio for 4 ED visits (95% confidence interval)	
				Unadjusted	Adjusted[b]
Depression[j]	99 (39.8)	64 (35.8)	35 (50.0)	1.8 (1.0–3.1)	0.8 (0.4–1.6)
Sensory impairment[k]	150 (60.2)	97 (54.2)	53 (75.7)	2.6 (1.4–4.9)	3.1 (1.4–6.9)

Abbreviations: ADL, Activity of Daily Living; IADL, Instrumental Activity of Daily Living; MMSE, Mini Mental State Examination; TMT-B, Trail Making Test Part B.

[a] Age analyzed in quartiles; reference was youngest quarter.

[b] Multivariable model adjusted for age quartiles, sex, and all variables with p value .05 for multivariable association.

[c] Alcohol problem defined as an Addiction Severity Index score 0.17.

[d] Drug problem defined as an Addiction Severity Index score 0.10.

[e] ADL impairment defined as difficulty performing 1 ADLs.

[f] IADL impairment defined as difficulty performing 1 IADLs.

[g] MMSE impairment defined as an MMSE score <24.

[h] Trail Making Test Part B impairment defined as a test duration >1.5 standard deviations above population-based norms, or as stopping the test early.

[i] Frailty defined as 3 of 5 of Fried's characteristics.

[j] Depression defined as a score 10 on the 9-item Patient Health Questionnaire depression scale.

[k] Sensory impairment defined as self-reported hearing difficulty despite wearing a hearing aid, self-reported difficulty seeing despite wearing corrective lenses, or visual acuity >20/40.

Table 2

Predictors of hospitalization over 12 months among 250 older homeless subjects

Baseline characteristics	All subjects (n=250)	<1 hospitalization (n=166)	1 hospitalization (n=84)	Odds ratio for 1 hospitalization (95% confidence interval)	
				Unadjusted	Adjusted[b]
Age, mean years (standard deviation)[a]	56.2 (5.3)	55.7 (4.7)	57.2 (6.3)	1.3 (1.0–1.6)	1.4 (1.1–1.8)
Male, No. (%)	202 (80.8)	131 (78.9)	71 (84.5)	1.5 (0.7–2.9)	1.2 (0.5–2.6)
White, No. (%)	100 (40.0)	59 (35.5)	41 (48.8)	1.7 (1.0–2.9)	1.8 (1.0–3.4)
Less than high school education, No. (%)	65 (26.2)	44 (26.8)	21 (25.0)	0.9 (0.5–1.7)	
Primary language English, No. (%)	217 (86.8)	140 (84.3)	77 (91.7)	2.0 (0.8–4.9)	
Insured, No. (%)	234 (94.7)	150 (92.0)	84 (100.0)	N/A[c]	
Lacks a usual source of health care, No. (%)	71 (29.2)	47 (29.2)	24 (29.3)	1.0 (0.6–1.8)	
Unable to see a health care provider when needed, No. (%)	40 (16.1)	18 (11.0)	22 (26.2)	2.9 (1.4–5.7)	2.1 (1.0–4.6)
1 outpatient clinic visits during the past year, No. (%)	216 (86.4)	136 (81.9)	80 (95.2)	4.4 (1.5–13.0)	6.8 (1.5–30.2)
Comorbidities, No. (%)					
Coronary heart disease	33 (13.3)	15 (9.2)	18 (21.4)	2.7 (1.3–5.7)	2.0 (0.9–4.6)
Diabetes mellitus	40 (16.2)	21 (12.9)	19 (22.6)	2.0 (1.0–3.9)	
Stroke	17 (6.9)	8 (4.9)	9 (10.7)	2.3 (0.9–6.3)	
Hypertension	147 (59.5)	92 (56.1)	55 (66.3)	1.5 (0.9–2.7)	
Pulmonary disease	78 (31.5)	45 (27.4)	33 (39.3)	1.7 (1.0–3.0)	
Alcohol problem, No. (%)[d]	46 (18.9)	25 (15.4)	21 (25.6)	1.9 (1.0–3.6)	1.7 (0.8–3.6)
Drug problem, No. (%)[e]	42 (17.0)	23 (14.1)	19 (22.6)	1.8 (0.9–3.5)	
Geriatric conditions, No. (%)					
ADL impairment[f]	74 (29.6)	44 (26.5)	30 (35.7)	1.5 (0.9–2.7)	
IADL impairment[g]	142 (57.3)	98 (59.8)	44 (52.4)	0.7 (0.4–1.3)	
1 falls during the past year	133 (53.4)	79 (47.9)	54 (64.3)	2.0 (1.1–3.4)	1.4 (0.8–2.7)
MMSE impairment[h]	61 (24.5)	41 (24.7)	20 (24.1)	1.0 (0.5–1.8)	
TMT-B impairment[i]	73 (30.0)	43 (26.7)	30 (36.6)	1.6 (0.9–2.8)	
Frailty[j]	40 (16.2)	24 (14.6)	16 (19.5)	1.4 (0.7–2.9)	

Baseline characteristics	All subjects (n=250)	<1 hospitalization (n=166)	1 hospitalization (n=84)	Odds ratio for 1 hospitalization (95% confidence interval)	
				Unadjusted	Adjusted[b]
Depression[k]	99 (39.8)	60 (36.4)	39 (46.4)	1.5 (0.9–2.6)	
Sensory impairment[l]	150 (60.2)	88 (53.3)	62 (73.8)	2.5 (1.4–4.4)	2.0 (1.1–3.7)

Abbreviations: ADL, Activity of Daily Living; IADL, Instrumental Activity of Daily Living; MMSE, Mini Mental State Examination; TMT-B, Trail Making Test Part B.

[a] Age analyzed in quartiles; reference was youngest quarter.

[b] Multivariable model adjusted for age quartiles, sex, and all variables with p value .05 for multivariable association.

[c] Unable to produce a parameter estimate for the association of insurance with hospitalization, as all subjects who were hospitalized were insured, and the model did not satisfy convergence criteria.

[d] Alcohol problem defined as an Addiction Severity Index score 0.17.

[e] Drug problem defined as an Addiction Severity Index score 0.10.

[f] ADL impairment defined as difficulty performing 1 ADLs.

[g] IADL impairment defined as difficulty performing 1 IADLs.

[h] MMSE impairment defined as an MMSE score <24.

[i] TMT-B impairment defined as a test duration >1.5 standard deviations above population-based norms, or as stopping the test early.

[j] Frailty defined as 3 of 5 of Fried's characteristics.

[k] Depression defined as a score 10 on the 9-item Patient Health Questionnaire depression scale.

[l] Sensory impairment defined as self-reported hearing difficulty, self-reported difficulty seeing despite wearing corrective lenses, or visual acuity >20/40.