Health Services Utilization Between Older and Younger Homeless Adults

Paul A. Nakonezny, PhD,¹ and Michael Ojeda, MS²

Purpose: Our purpose in the current study was to examine the relationship between health services utilization delivered by means of the Homeless Outreach Medical Services (HOMES) program and health services utilization delivered by means of the Parkland emergency room and inpatient units among a sample of older and younger homeless adults being served by the Parkland Health and Hospital System. Design and Methods: The HOMES program uses two 40-ft-long mobile medical units and a fixed-site outpatient clinic to provide primary health care on a walk-in, no-charge basis to individuals who are homeless. We used a quasi-experimental design, and we randomly selected health services utilization data from 293 male (50.4%) and 288 female (49.6%) homeless patients from among the 14,876 homeless patients aged 20–64 years who used HOMES and the Parkland Health and Hospital System between June 1, 1992, and June 30, 1999. The dependent variables were measurements of inpatient and outpatient utilization of psychiatric, substance abuse, and musculoskeletal services by homeless patients. Inpatient and outpatient utilization patterns by age were assessed. Data were analyzed using a split-plot repeated measures multivariate analysis of variance (MANOVA), one-way analysis of variance (ANOVA), and simple linear regression. Results: Older homeless individuals utilized the HOMES more than inpatient services for substance abuse and musculoskeletal conditions, but they utilized inpatient services the most for psychiatric-related conditions. Implications: This level of inpatient utilization is perhaps a result of greater severity or progression of mental illness among older homeless adults. The level of outpatient utilization is probably because the HOMES program mitigates many of the barriers that prevent homeless individuals from obtaining primary medical care.

Key Words: Homeless person, Health service, Indigenous health services

We are grateful to all those individuals who make the Homeless Outreach Medical Services program possible. The views presented in this article are those of the authors and do not necessarily reflect those of the Parkland Health and Hospital System and any other agency or its officials associated with this program. Michael Ojeda is no longer affiliated with the Parkland Health and Hospital System. Address correspondence to Paul A. Nakonezny, PhD, Center for Biostatistics & Clinical Science and Department of Psychiatry, The University of Texas Southwestern Medical Center, 5323 Harry Hines Boulevard, Dallas, TX 75390-8828. E-mail: paul.nakonezny@utsouthwestern.edu

¹Center for Biostatistics & Clinical Science and Department of Psychiatry, The University of Texas Southwestern Medical Center at Dallas.
²Parkland Health & Hospital System and Texas Woman’s University, Dallas.
buildings, bus or train stations)” 42 U.S.C. § 11302(a). To be homeless, however, means more than to lack a domicile; it is a symptom of personal and societal disaffiliation. It is estimated that there are between 1 and 2 million homeless people in the United States (National Coalition for the Homeless, 1999), representing a wide variety of individuals: single men, single women, couples with children, single women with children, adolescents (e.g., runaways), and older adults (Gillis & Singer, 1997). Of the homeless population in the United States, about 25% are older adults over the age of 50 years (Rossi, 1989).

The rates of both acute and chronic health problems are high among the U.S. homeless population (Amarasingham, Spalding, & Anderson, 2001; Wojtusik & White, 1998), and the prevalence of morbidity increases with age (Gelberg, Linn, & Mayer-Oakes, 1990). Substance abuse, acute infections, musculoskeletal problems, hypertension, mental illness, dermatologic disease, and trauma are common among older individuals who are homeless (Amarasingham et al.; Wojtusik & White). Previous researchers (e.g., Crane, 1996) have found that older homeless adults have a greater need for health services, in part because they are more likely than younger homeless individuals to be in poorer health, but, because they have limited access to health services, these health problems often go untreated or treatment is delayed. Access to health services by homeless adults is usually limited by such factors as lack of transportation; lack of self-efficacy to compete for social and health services in the traditional institutional setting; and lack of outreach health services that are geared toward the special needs of homeless adults (Gillis & Singer, 1997; Sachs-Ericsson, Wise, Debrody, & Paniucki, 1999). Thus, for many homeless individuals, the county hospital and emergency room setting remains the source of usual, nonemergency, medical care, even though this setting is not an ideal mode of delivery for individuals who are homeless to receive primary health care services (Gillis & Singer).

To augment access to health care and to mitigate the burden on the hospital and emergency room setting, county hospitals have to explore nontraditional, ambulatory modes of health services delivery that are targeted specifically to the homeless population. One alternative model being used by the Parkland Health and Hospital System in Dallas, Texas—a large county hospital—is the Homeless Outreach Medical Services (HOMES) program, which uses two mobile medical units and a fixed-site outpatient clinic to provide primary health care to homeless individuals.

Our purpose in the current study was to examine the relationship between health services utilization delivered by means of the HOMES program and health services utilization delivered by means of the Parkland emergency room and inpatient units among a sample of older and younger homeless adults being served by the Parkland Health and Hospital System. Specifically, given greater access to health services by means of the HOMES program, homeless persons will, we predict, have greater outpatient utilization than inpatient utilization for the disease conditions addressed in this study. We also expect that older homeless adults will have greater utilization of health services than younger homeless individuals.

Methods

Project Setting

The HOMES program is a collaborative venture among the Parkland Health and Hospital System in Dallas, Texas; the city of Dallas; and the Children’s Health Fund. Funding for HOMES is provided by the Dallas County Hospital District, the Stewart B. McKinney Health Care for the Homeless Fund, the Children’s Health Fund, and private foundations and corporations.

The HOMES program uses two 40-ft (12.18 m)-long mobile medical units (MMUs) and a fixed-site outpatient clinic to provide primary health care on a walk-in, no-charge basis to individuals who are homeless. The HOMES program targets areas in Dallas County, Texas, where homeless individuals congregate. Primary care is provided by physicians, nurses, nurse practitioners, mental health professionals, registered dietitians, and social workers. Homeless patients who require health care that cannot be delivered through the HOMES program are referred to the appropriate units within the Parkland Health and Hospital System.

Design and Sample

We used a quasi-experimental design, and we randomly selected health services utilization data from 293 male (50.4%) and 288 female (49.6%) homeless patients from among the 14,876 homeless patients aged 20–64 years who used HOMES and the Parkland Health and Hospital System between June 1, 1992, and June 30, 1999. A sample size of 581 permitted an estimation of the true population mean utilization to within ±1.5 units of utilization with 95% confidence (Cochran, 1977). The homeless patients in the current sample (and in the HOMES system) included the sheltered homeless and the unsheltered homeless. Subject characteristics, including those by age group, are reported in Table 1.

Procedures and Measures

Dependent Variables.—The dependent variables we used were measurements of inpatient and outpatient utilization of psychiatric, substance abuse, and musculoskeletal services by homeless patients. We used the International Classification of Disease, 9th edition (ICD-9), system of coding as our basis for these three diagnostic categories, and we selected them for analysis because they are among the most prevalent disease conditions found in the general homeless adult population, including the homeless population being served by HOMES (Amarasingham et al., 2001; Wojtusik & White, 1998). Psychiatric conditions represented in the...
current study included paranoid schizophrenia, schizophrenic-affective disorder, unspecified schizophrenia, severe depression, manic-depressive disorder, unspecified psychosis, and depressive disorder (ICD-9 codes were 295.3, 295.7, 295.9, 296.2, 296.8, 298.9, and 311.0, respectively). Substance abuse conditions represented in the current study included unspecified alcohol dependence (ICD-9 code was 303.9) and unspecified drug dependence (ICD-9 code was 304.9). Musculoskeletal conditions represented in the current study included degenerative joint disease, unspecified backache, and musculoskeletal disorders (ICD-9 codes were 715.9, 724.5, and 729.9, respectively).

We measured outpatient utilization as the number of visits to the HOMES MMUs and fixed-site outreach clinic, and we measured inpatient utilization as the number of visits to the Parkland emergency room and inpatient units. Over a 7-year time period from June 1992 to June 1999, we tracked each homeless patient’s inpatient and outpatient utilization for psychiatric, substance abuse, and musculoskeletal conditions.

**Independent Variables.**—To test the relationship between age and health services utilization, we divided the sample into two groups: young and old. We defined younger homeless adults as being 20 to 49 years of age and older homeless adults as being 50 to 64 years of age, with 20 years and 64 years representing the youngest age and oldest age, respectively, of a homeless patient in the current sample. Previous homeless research suggests that the minimum age demarcation of 50 years for an older homeless adult is meaningful, because the biopsychological characteristics of homeless individuals tend to resemble those of adults in the general population who are 10 to 20 years older (Cohen, Teresi, & Holmes, 1988; Doolin, 1986).

**Table 1. Subject Characteristics by Age Group and Diagnosis**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Psychiatric (n = 197)</th>
<th>Substance Abuse (n = 190)</th>
<th>Musculoskeletal (n = 194)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Younger Group M SD n (%)</td>
<td>Older Group M SD n (%)</td>
<td>Younger Group M SD n (%)</td>
</tr>
<tr>
<td>Age (years)</td>
<td>36.9 7.1 166 (84.3)</td>
<td>56.4 4.3 31 (15.7)</td>
<td>38.2 6.3 152 (80.0)</td>
</tr>
<tr>
<td>Gender</td>
<td>Male</td>
<td>.03b</td>
<td>Female</td>
</tr>
<tr>
<td></td>
<td>78 (47.0)</td>
<td></td>
<td>68 (44.7)</td>
</tr>
<tr>
<td></td>
<td>88 (53.0)</td>
<td></td>
<td>84 (55.3)</td>
</tr>
<tr>
<td>Race</td>
<td>Black</td>
<td>.17b</td>
<td>White</td>
</tr>
<tr>
<td></td>
<td>100 (60.2)</td>
<td></td>
<td>96 (63.2)</td>
</tr>
<tr>
<td></td>
<td>54 (32.6)</td>
<td></td>
<td>50 (32.9)</td>
</tr>
<tr>
<td></td>
<td>Hispanic</td>
<td>12 (7.2)</td>
<td></td>
</tr>
</tbody>
</table>

*An F statistic was used to test for mean age differences between younger and older homeless adults within each diagnosis category.  
* A chi-square statistic was used to test for gender and racial differences between younger and older homeless adults within each diagnosis category.

**Data Analysis**

Our primary data analysis was a split-plot repeated measures multivariate analysis of variance (MANOVA), with Age (young, old) serving as a between-subjects factor and Unit (outpatient, inpatient) serving as a within-subjects factor. We conducted a separate repeated measures MANOVA for each of the three disease conditions (psychiatric, substance abuse, and musculoskeletal). We used the repeated measures MANOVA design to assess the main effect of age on the difference in health services utilization (outpatient utilization minus inpatient utilization) over the 7-year time period. We also used an analysis of variance (ANOVA) to assess the main effect of age on inpatient utilization and on outpatient utilization averaged over the 7-year period. We performed a separate ANOVA for each of the three disease conditions. As a secondary analysis, we used simple linear regression to test the relationship between age (continuously measured) and inpatient and outpatient utilization for each of the three disease conditions.

**Results**

**Psychiatric Utilization**

The MANOVA indicated no significant age effect, $F(1, 195) = 0.03, p > .87$, for the average difference in psychiatric utilization (outpatient minus inpatient) across the 7-year time period. Means and standard errors for the inpatient and outpatient psychiatric utilization are reported in Table 2. Further, the ANOVA revealed no significant age effect for the HOMES MMU outpatient psychiatric utilization, $F(1, 195) = 0.35, p < .56$ (Table 2). The ANOVA, however,
revealed a significant age effect for inpatient psychiatric utilization, \(F(1, 195) = 9.61, p < .002\), with older homeless adults having a greater average inpatient utilization than younger homeless adults (Table 2).

A simple linear regression also revealed a significant relationship between age and inpatient psychiatric utilization, \(b = .05, \beta = .23, t(195) = 3.28, p < .001\) (Table 3). The regression results, however, indicated no significant relationship between age and the HOMES MMU outpatient utilization for homeless psychiatric patients, \(b = .06, \beta = .04, t(195) = 0.58, p < .56\).

### Substances Abuse and Musculoskeletal Utilization

The MANOVA revealed a significant age effect for the average difference in substance abuse utilization (outpatient minus inpatient), \(F(1, 188) = 9.30, p < .003\), and for the average difference in musculoskeletal utilization, \(F(1, 192) = 4.49, p < .03\), over the 7-year time period. The results are reported in Table 2. Further, the ANOVA revealed a significant age effect for HOMES MMU outpatient substance abuse utilization, \(F(1, 188) = 11.54, p < .001\), and for HOMES MMU outpatient musculoskeletal utilization, \(F(1, 192) = 5.12, p < .02\), with older homeless adults having a greater average outpatient utilization than younger homeless adults (Table 2). The ANOVA, however, revealed no significant age effect for inpatient substance abuse utilization, \(F(1, 188) = 1.89, p < .17\), and for inpatient musculoskeletal utilization, \(F(1, 192) = 0.70, p < .40\) (Table 2).

A simple linear regression also revealed a significant relationship between age and the HOMES MMU outpatient substance abuse utilization, \(b = .35, \beta = .19, t(188) = 2.70, p < .007\), and between age and the HOMES MMU outpatient musculoskeletal utilization, \(b = .47, \beta = .18, t(192) = 2.60, p < .01\) (Table 3). The regression results, however, indicated no significant relationship between age and inpatient utilization for substance abuse patients, \(b = .09, \beta = .10, t(188) = 1.38, p < .16\), and for homeless musculoskeletal patients, \(b = .03, \beta = .04, t(192) = 0.62, p < .53\).

### Discussion

In general, the findings show that, across the 7-year time period, homeless individuals had greater outpatient utilization (by means of the HOMES MMUs and fixed-site clinic) than inpatient utilization (by means of the Parkland emergency room and inpatient units) for the three disease conditions (psychiatric, substance abuse, and musculoskeletal) addressed in this study. Specifically, older homeless adults, in relation to younger homeless individuals, had significantly greater outpatient utilization than inpatient utilization for substance abuse and musculoskeletal conditions. There are a few plausible interpretations for this utilization pattern of outpatient services. One obvious interpretation is that older homeless adults have a greater need for health services, because they are more likely than younger homeless individuals to be in poorer health (Crane, 1996; Gelberg & Linn, 1992; Gelberg et al., 1990). Another interpretation is that the HOMES program provides many of the barriers for homeless adults in the acquisition of health care services, and the HOMES fixed-site outpatient clinic is structured to treat homeless adults who suffer from substance abuse and musculoskeletal conditions (among other conditions). Further, the HOMES MMUs and fixed-site outpatient clinic offer a spectrum of health services where homeless adults congregate, which eliminates transportation and access barriers. In addition, all HOMES outpatient services are free of charge, all patients are seen on a walk-in basis, and the HOMES services are delivered by health care professionals who are sensitive to the special needs of homeless adults.

The utilization of health services by homeless adults at the HOMES program, as reported in this study, is

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**Table 2. Health Services Utilization by Age and Diagnosis**

<table>
<thead>
<tr>
<th>Utilization by Diagnosis</th>
<th>Younger Group</th>
<th>Older Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SE</td>
</tr>
<tr>
<td>Psychiatric</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outpatient utilization</td>
<td>8.31</td>
<td>1.23</td>
</tr>
<tr>
<td>Inpatient utilization</td>
<td>0.68</td>
<td>0.17</td>
</tr>
<tr>
<td>Difference in utilization</td>
<td>7.63</td>
<td>1.18</td>
</tr>
<tr>
<td>Substance abuse</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outpatient utilization</td>
<td>9.94</td>
<td>1.32</td>
</tr>
<tr>
<td>Inpatient utilization</td>
<td>1.88</td>
<td>0.66</td>
</tr>
<tr>
<td>Difference in utilization</td>
<td>8.06</td>
<td>1.18</td>
</tr>
<tr>
<td>Musculoskeletal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outpatient utilization</td>
<td>15.44</td>
<td>2.02</td>
</tr>
<tr>
<td>Inpatient utilization</td>
<td>1.36</td>
<td>0.58</td>
</tr>
<tr>
<td>Difference in utilization</td>
<td>14.08</td>
<td>1.93</td>
</tr>
</tbody>
</table>

Notes: Outpatient utilization represents the number of visits to the Homeless Outreach Medical Services mobile medical units and fixed-site clinic averaged during the 7-year period. Inpatient utilization represents the number of visits to the Parkland emergency room and inpatient units averaged during the 7-year period. Difference in utilization represents outpatient utilization minus inpatient utilization averaged during the 7-year period.

\(^a\)An F statistic was used to test for average utilization differences between younger and older homeless adults within each diagnosis category.

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**Table 3. Regression Results: Relationship Between Age and Inpatient and Outpatient Utilization Within Each Diagnosis Category**

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Inpatient Utilization</th>
<th>Outpatient Utilization</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(b)</td>
<td>(\beta)</td>
</tr>
<tr>
<td>Psychiatric age(^a)</td>
<td>.05</td>
<td>.23</td>
</tr>
<tr>
<td>Substance abuse age(^b)</td>
<td>.09</td>
<td>.10</td>
</tr>
<tr>
<td>Musculoskeletal age(^c)</td>
<td>.03</td>
<td>.04</td>
</tr>
</tbody>
</table>

\(^a\)This is the relationship between age and psychiatric inpatient and outpatient utilization.

\(^b\)This is the relationship between age and substance abuse inpatient and outpatient utilization.

\(^c\)This is the relationship between age and musculoskeletal inpatient and outpatient utilization.

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The results of this study may be tempered by the nature of the study. The design and analysis, as in any quasi-experimental setting, cannot logically rule out the possibility that other factors besides the HOMES program either combined with or independently influenced the health services utilization patterns during the study period. It is hard to imagine a more salient individual influence besides the HOMES program, however, that might have plausibly affected health services utilization among the homeless patients in the current study over a 7-year period. Finally, broadly generalizing the results to homeless populations is beyond the scope of this study. The statistical analyses, however, may support generalizing to settings that appear similar to those in the current study.

Health services utilization among the homeless population is an underdeveloped area of research. There especially exits a dearth of research examining outreach efforts (such as MMUs) and health services acquisition among older homeless adults. Although prior research has addressed utilization patterns of homeless individuals at homeless outreach programs, these prior studies have primarily relied on cross-sectional designs with samples of younger homeless adults. The current study is unique, and different from previous research, in that we track the same group of both older and younger homeless adults over a 7-year period and we examine their health services utilization patterns at both the HOMES program and the Parkland emergency room and inpatient units. Although the current study is a step toward addressing paucity in the literature, future research concerning homeless adults’ health needs and health outcomes associated with outreach medical care is needed. A logical next phase in this line of programmatic research of the HOMES program is to address cost assessment and health-related outcomes associated with health care delivery. Possible outcomes to address in future research would include the assessment of health care delivery cost; medication cost; improvement in symptoms associated with psychiatric, substance abuse, and musculoskeletal conditions; and global assessment of functioning and quality of life.

Implications and Conclusion

A significant void exists between the medical needs of the older homeless population and the current health care system in the United States. The HOMES program is an example of a health care delivery model that addresses the complex and unique health care needs of individuals who are homeless. If hospital systems and the community are to be successful in meeting the health care needs of the homeless population, they must develop programs that are accessible—so that health problems do not go untreated—and they must build a social support network for homeless adults to break down the social isolation barrier. These programs also must be designed with sensitivity to the special needs associated with homelessness.

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References


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