


Health care utilization following a homeless medical respite pilot program

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Abstract

Objective: The purpose of this study was to evaluate a homeless medical respite pilot program to determine if program participants had health care utilization pattern changes and improved connection to income, housing, and health care resources post program.

Design: This is a quantitative descriptive pre-/post-program evaluation.

Sample: A total of 29 patients experiencing homelessness and discharged from an acute care hospital in the southeastern United States were provided with housing and nursing case management.

Measurements: Demographics including age, sex, race, and ethnicity were collected. Connection to primary care, mental health, substance abuse services, income, insurance, and housing were assessed at program entry and completion. Health care utilization and charge and payment data were collected 1 year prior and 1 year post-respite stay.

Results: Participants demonstrated reduced hospital admissions (−36.7%) and when admitted, fewer inpatient days (−70.2%) and increased outpatient provider visits (+192.6%). Health care charges for the cohort decreased by 48.6% from the year prior to the program. Housing and income improved.

Conclusions: The medical respite pilot program was successful in guiding patients to community resources for more appropriate health care at a demonstrated cost savings. Participants also derived benefits in the form of improved housing and income.

KEYWORDS

health care utilization, homelessness, medical respite, pilot study

1 | INTRODUCTION

Health correlates of homelessness are well-documented. In comparison with the general population, homeless individuals demonstrate higher rates of mental health issues including psychiatric disorders and substance abuse, infectious diseases, unintentional injuries, and early mortality (Fazel, Geddes, & Kushel, 2014). Increased morbidity leads to increased health system utilization, particularly emergency

department (ED) visits (Wang et al., 2015). More hospital admissions and longer (Hwang et al., 2013) and more expensive (Hwang, Weaver, Aubry, & Hoch, 2011) inpatient stays are also common for homeless individuals in need of health care.

Medical respite programs began to emerge in the early 1980s to provide a safe and clean place for individuals experiencing homelessness to recover from illness, injury, and medical procedures and during prolonged treatments such as chemotherapy or intravenous

antibiotic administration (Zlotnick, Zerger, & Wolfe, 2013). These programs vary in size and scope of services based on community needs and resources, and often involve partnerships among multiple entities.¹ Our community in the southeastern United States coalesced around the need to provide a safe place for homeless individuals in need of postacute care and developed a medical respite program. In this article, we describe the grassroots establishment and the outcomes of our 2-year pilot program.

Analysis has shown that medical respite programs are associated with decreased hospitalizations (Buchanan, Doblin, Sai, & Garcia, 2006; Sadowski, Kee, VanderWeele, & Buchanan, 2009), fewer inpatient days (Buchanan et al., 2006; McGuire & Mares, 2000; Sadowski et al., 2009), and decreased 90-day readmission rates (Kertesz et al., 2009). That translates into a lower demand on acute care providers, lower costs for medical facilities, and cost savings for patients (National Health Care for the Homeless Council, 2011). Medical respite is less expensive than inpatient care (Buchanan et al., 2006; McGuire & Mares, 2000), and analysis with adjustment for hospitalizations has demonstrated cost savings when compared to control groups (Basu, Kee, Buchanan, & Sadowski, 2012; Buchanan, Kee, Sadowski, & Garcia, 2009; Sadowski et al., 2009). Following medical respite, many homeless patients find housing; this appears to be a consistent outcome in studies (e.g., Basu et al., 2012; Buchanan et al., 2009; Sadowski et al., 2009; Meschede, 2010). Research also indicates that medical respite programs decrease ED visits (Sadowski et al., 2009). Our study sought to answer the research question: Would a medical respite program in our area successfully guide patients to community resources for more appropriate health care at a demonstrated cost savings, improving their housing and income in the process?

2 | BACKGROUND

From 2009 to 2013, homelessness in Durham, North Carolina increased by 41% (U.S. Department of Housing and Urban Development, 2018). With this came an increase in concerns voiced by both service providers and homeless patients regarding the lack of a place for people experiencing homelessness to recover from illness and injury (Biederman, Gamble, Manson, & Taylor, 2014). In early 2012, leaders of homeless service agencies, clinicians, non-profits, and concerned citizens in our community developed criteria, a business plan, and a model for medical respite care. As a Medicaid non-expansion state, the majority of patients had no payor source, making it difficult to obtain financial support for the program. Due to the lack of start-up funds, the group opted for a scattered-sites model that would cover the costs of renting rooms in sober houses, boarding homes, and motels for participants. In July 2014, with in-kind donations for case management and connection to care and

financial support from Durham County to offset housing costs, the 2-year medical respite pilot program was launched.

Project Access of Durham County (PADC), an organization dedicated to serving un- and under-insured individuals in Durham County, was the pilot program's lead agency and handled all referrals, housing arrangements, and program-specific data. Consultation and general oversight regarding clinical matters was provided by a nurse practitioner, who had previously been the Lincoln Community Health Center Health Care for the Homeless (HCH) lead clinician and clinic manager for 8 years. Less than 6 months prior, this nurse practitioner had transitioned from the HCH into a clinical role at the Duke Outpatient Clinic (DOC) but still worked with a similar patient population: low-income, un- or under-insured, and oftentimes housing-unstable or homeless individuals. Care coordination was provided by a nurse case manager whose salary was supported by PADC. This nurse already had a full case management load of un- and under-insured patients but agreed to take additional patients. Respite locations included: Healing with CAARE, an agency that provides health education, counseling, and case management services; Just a Clean House, an organization that provides recovery housing for people with addiction issues, and local motels. The medical respite program was designed to provide a safe place to recover for people who had a medical problem and who would be discharged to home if they had one. This would allow for in-home services which are typically not allowed in emergency shelters including home health, home physical therapy, and hospice.

Due to financial constraints and lack of a full-time staff, referrals were limited to care providers who specialized in the needs of homeless patients: the complex discharge planner at Duke University Hospital; Lincoln Health Care for the Homeless clinic staff; PADC; and the DOC, Duke's internal medicine resident clinic that provides care to low-income patients. The medical respite program was designed to facilitate access to and coordination of care among all of these resources. Inclusion criteria were that the patient must: be experiencing homelessness per the United States Department of Housing and Urban Development guidelines; be 18 years of age and older; be competent in activities of daily living (ADLs); have ongoing medical needs; would be discharged to home if not experiencing homelessness. A total of 29 individuals were enrolled in the program. Length of program time was individualized for each patient depending on their medical problems and ability to adhere to program requirements.

3 | METHOD

3.1 | Study design

This is a pre/post intervention quantitative program evaluation and began in July 2017, one year after the final patient was discharged. In order to access the medical records of the 29 individuals who participated in the medical respite program, we asked for and received institutional review board approval with a waiver of consent from Duke Health.

¹The National Health Care for the Homeless Council is the preeminent authority on medical respite in the United States and maintains a directory of U.S.-based medical respite programs available at <https://www.nhchc.org/mrdirectory/>.

3.2 | Measures

At program enrollment we collected demographics including age, sex, race, and ethnicity. Income and source, insurance status, housing type, and connection to primary care, mental health, and/or substance abuse services was assessed at program entry and completion. A patient was considered previously connected to care if he or she had kept at least two appointments at a single agency in a rolling year. Total number of program referrals, referral sources, and reason for referral refusal were also noted.

In addition, we administered the Vulnerability Index-Service Prioritization Decision Assistance Prescreen Tool Version 1 (VI-SPDAT; OrgCode Consulting, Inc., 2016; VI-SPDAT) to assure our patients would be prioritized for housing. The VI-SPDAT is an amalgamation of the Vulnerability Index, based on the research of Hwang et al. (1998), which includes medical conditions likely to contribute to the death of homeless persons and the Service Prioritization Decision Assistance Tool designed for intake and case management.² The tool has 50 questions in five domains—general information, history of housing and homelessness, risks, socialization and daily function, and wellness—with a maximum score of 20. Scores of 10 or greater indicate a high level of vulnerability. The VI-SPDAT is widely used in the United States to prioritize housing. At the time of this study, Durham used the VI-SPDAT, version 1, for this purpose.

3.3 | Health care utilization and charge/payment data

We examined patients' electronic health records (EHRs) to determine if, in support of the literature, these postmedical respite patients had: decreased hospitalizations, decreased inpatient days, increased outpatient visits, and decreased ED use. We also expected that if the change in utilization was evident, it would be accompanied by decreased hospital charges.

A standard operating procedure was used to access EHRs and tabulate the number of hospitalizations, inpatient days, outpatient visits, and ED visits for each patient. Charge and payment data were electronically abstracted via Duke Health's centralized billing and collection system. These data were transferred to an Excel spreadsheet. All data were stored in a secure, limited-access shared folder.

3.4 | Data analysis

Data were transferred from Excel into a Statistical Analysis System (SAS) database. Descriptive statistics, including frequencies, percentages, means, medians, and standard deviations, were calculated. All analyses were completed using SAS 9.4 (Cary, NC).

4 | RESULTS

During the 2-year pilot project, the program received 44 referrals and accepted 29 (66%) patients. Reasons for exclusion included: not competent in ADLs (47%) as determined by patient assessment, no acute medical need (27%), not a Durham County resident (13%), and opted out (13%). Referral sources for accepted participants included: Duke University Hospital (48%), Duke Regional Hospital (21%), Lincoln HealthCare for the Homeless Clinic (24%), and the DOC (7%).

Of the 29 patients admitted into the medical respite program the majority were Black (52%), non-Hispanic (97%), and male (90%). Mean age was 47.3 years ($SD = 8.5$). VI-SPDAT scores ranged from 4 to 14 with a median of 8 (see Table 1).

The length of stay (LoS) in the respite program was 1–136 days, with a mean stay of 33.9 days ($SD = 28.8$) and a median of 29 days. The majority (76%) completed the LoS recommended by their primary care providers. Seven patients left the program early. Three left against medical advice, two were evicted for violating house rules, one was hospitalized, and one died. Findings supported most elements of our research question and the literature. Benefits such as income and medical coverage increased as 13 participants (45%) were approved for Medicaid, and 14 (48%) secured an income source. Housing status improved for 10 participants (34.5%). Seven patients (24%) were newly connected to a primary care provider and 9 (31%) were newly connected to behavioral health services (see Table 2).

VI-SPDAT scores were nearly the same between Blacks and Whites, who completed the medical respite program. However, the scores were higher for those who did not complete the recommended stay (see Table 3).

Health care utilization changed. Hospital admissions decreased by nearly 37%. Inpatient days decreased by 70%, and outpatient visits tripled. Only ED visits defied our expectations and remained unchanged pre- and postprogram (see Table 4).

We also expected that if we found all of these changes in utilization, they would be accompanied by a cost savings. That is what we found. Medical system charges for these participants decreased by 48.6% from the year prior to the year following medical respite,

TABLE 1 Patient characteristics

	Mean (SD)			
Age	47.3 (8.5)			
	N (%)			
Sex	Male 26 (90)			
Race	Black 15 (52)	White 14 (48)		
Ethnicity	Hispanic or Latino 1 (3)	Non-Hispanic or Latino 28 (97)		
VI-SPDAT score	≥10	7–9	≤6	Unknown
	10 (34.5)	10 (34.5)	6 (20.7)	3 (10.3)

²The VI-SPDAT current version and other assessment tools are available free of charge from OrgCode at <http://www.orgcode.com/products>.

TABLE 2 Patient medical respite information

Patient ID	Age	VI-SPDAT	Reason for medical respite	LoS in days	Respite completed? If not, why?	Benefits acquired during stay ^a	Prior housing	Discharged to
1	52	Unk	Neurosurgery	13	Yes	SSI/SSDI; Medicaid	Emergency shelter	Emergency shelter
2	60	13	Ortho surgery	136	Yes	SSI/SSDI; PCP; Medicaid	Unsheltered	Transitional housing
3	57	6	Infection	68	Yes	SSI/SSDI; PCP; Medicaid	Vehicle	Transitional housing
4	29	4	General surgery	49	Yes	SSI/SSDI; Medicaid; PCP; MH/SA	Emergency shelter	Transitional housing
5	60	5	Infection	38	Yes	Part-time employment	Housed ^b	Transitional housing
6	51	3	Ortho surgery	27	Yes	Full-time employment	Emergency shelter	Emergency shelter
7	42	11	Vascular surgery	29	Yes	SSI/SSDI; Medicaid	Emergency shelter	Transitional housing
8	51	14	Medical	57	Yes	SSI/SSDI; Medicaid; PCP; MH/SA	Housed ^b	Transitional housing
9	44	7	Medical	17	Yes	Medicaid	Friends	Emergency shelter
10	52	Unk	General surgery	14	Yes	SSI/SSDI	Emergency shelter	Emergency shelter
11	33	8	Ortho surgery	16	No/violated house rules		Unsheltered	Unsheltered
12	58	6	Ortho surgery	66	Yes	MH/SA	Unsheltered	Unsheltered
13	44	10	Medical	62	Yes	Medicaid	Housed ^b	Transitional housing
14	51	13	Medical	5	No/left AMA		Unsheltered	Unsheltered
15	35	7	Medical	7	Yes		Unsheltered	Transitional housing
16	41	13	Surgical site dehiscence	14	No/hospitalized	SSI/SSDI; Medicaid	Friends	Hospital
17	52	Unk	Ortho surgery	1	No/left AMA	PCP	Transitional housing	Transitional housing
18	44	8	Ortho trauma w/o surgery	74	Yes	MH/SA	Emergency shelter	Emergency shelter
19	52	9	General surgery	7	Yes		Unsheltered	Unsheltered
20	46	10	Ortho trauma w/o surgery	14	No/left AMA		Unsheltered	Unsheltered
21	54	8	General surgery	35	Yes		Emergency shelter	Emergency shelter
22	45	12	Infection	16	Yes	SSI/SSDI; Medicaid; PCP; MH/SA	Unsheltered	Unsheltered
23	32	8	Ortho trauma w/o surgery	35	Yes	PCP; MH/SA	Unsheltered	Transitional housing
24	49	7	General surgery	55	No/deceased		Emergency shelter	Deceased
25	60	8	General surgery	28	Yes	Part-time employment	Emergency shelter	House
26	42	9	Medical	28	Yes	SSI/SSDI; Medicaid; MH/SA	Emergency shelter	Mental health facility
27	45	13	General surgery	17	No/violated house rules	SSI/SSDI; Medicaid; MH/SA	Unsheltered	Unsheltered
28	53	10	Medical	44	Yes	MH/SA	Unsheltered	Unsheltered
29	39	4	Infection	10	Yes		Unsheltered	Unsheltered

^aThese are new connections to income and health care resources. SSI/SSDI refers to income source. PCP refers to connection to primary care. MH/SA refers to connection to mental health and/or substance abuse services. ^bThese patients were housed prior to their hospitalization and lost their housing during their hospital stays.

TABLE 3 Distribution of Vulnerability Index-Service Prioritization Decision Assistance Prescreen Tool (VI-SPDAT) (V1) scores by race and medical respite completion status

Medical respite completed?	Race	VI-SPDAT score mean (SD)
Yes	Black, <i>n</i> = 13	7.82 (3.65)
	White, <i>n</i> = 9	8.44 (2.13)
No	Black, <i>n</i> = 3	10.33 (2.52)
	White, <i>n</i> = 3	10.00 (4.24)
	Latino, <i>n</i> = 1	13.00

while charge capture reflected in per cent payment capture increased slightly (see Table 5).

5 | DISCUSSION

This evaluation reports outcomes of a medical respite program for homeless individuals discharged into the community following treatment in an acute care facility. Consistent with previous studies, our patients demonstrated substantial improvements in health care utilization patterns including decreased hospital admissions (Basu et al., 2012; Sadowski et al., 2009), fewer inpatient days (Basu et al., 2012; Buchanan et al., 2006; Sadowski et al., 2009), and increased visits with primary care and other community service providers (Basu et al., 2012). All of this led to lower health care system costs. Only ED visits showed no improvement. There are a few plausible and well-documented explanations. First, homeless persons are three to six times more likely than their domiciled counterparts to experience acute physical disorders. They also have high rates of mental illness. These disorders, coupled with a lack of insurance, often lead this patient population to seek care at an ED, typically attached to a teaching hospital similar to ours (Sun, Karaca, & Wong, 2017). Additionally, although the prevalence of chronic illnesses (e.g., diabetes, hypertension) is similar between homeless and low-income housed persons, homeless persons experience worse chronic illness control and have more complications that lead to ED visits (Fazel et al., 2014). Homelessness is considered a risk factor for ED use (Lebrun-Harris et al., 2013) and associated with high ED utilization (Ostermeyer, Baweja, Schanzer, Han, & Shah, 2018).

TABLE 4 Health care utilization pre, during, and postmedical respite

	1 year pre	Medical respite	1 year post	% Difference from pre year
ED visits	166	24	165	-0.60
Hospital admits	49	6	31	-36.73
Inpatient days	728	20	217	-70.19
Outpatient visits	95	73	278	192.63

TABLE 5 Health system charges and payment capture pre/post medical respite

	1 year pre	1 year post
Charges	\$3,492,662	\$1,794,136
Payments	\$247,236	\$144,037
% Payment capture	7.08	8.03

While all program participants were temporarily housed for their medical respite stays and a substantial number were discharged to improved housing conditions, nine participants were discharged to unsheltered homelessness. Our city, like many across the country, is experiencing an affordable housing crisis (Aurand et al., 2018). In fact, affordable housing was named as the primary health concern in the most recent Durham County community health assessment.³ Considerable effort is being expended to increase the housing stock for low-income persons in our community. Until progress is made in this area, decreased ED utilization by homeless persons may be difficult to achieve.

In our evaluation, participant improvements in income and insurance were also demonstrated. This was primarily through application for and receipt of SSI/SSDI and Medicaid which was facilitated by specially trained SSI/SSDI Outreach, Access, and Recovery (SOAR) workers who were in our referral networks. SOAR is a Substance Abuse and Mental Health Services Administration sponsored program specifically targeting homeless persons who may qualify for these benefits. A large multi-state study demonstrated that SOAR workers were successful in securing SSI/SSDI application acceptance far beyond the rate of persons who did not have a SOAR worker (10% to 73%, respectively). Mean application time from submission to acceptance decreased as well (Dennis, Lassiter, Connelly, & Lupfer, 2011). In this study, this translated to increased compensation for the hospital and decreased out-of-pocket medical expenses for patients. Patients also benefited by the knowledge and comfort of having medical insurance as many had comorbid conditions and ongoing medical needs.

We attempted to limit the referring agencies to those providers and clinicians who were involved in the planning of the medical respite pilot program, thus were not expecting a high rate of referral refusal. However, there is substantial pressure for acute care providers to find suitable discharge arrangements for their patients. In this pilot project, less than half of the referrals were accepted. The primary reason for exclusion was patient's inability to independently perform ADLs. Many respite programs—like this one—require clients to be competent, or require only minimal assistance, in ADLs. A high number of referral refusals, could decrease confidence in the program and compromise future referrals and program sustainability. Educating providers about the expectations and limitations of the program may prevent this problem in the future, thereby encouraging the expansion of the medical respite program and resulting in improved population health.

An interesting study finding is that three participants were housed prior to entering the hospital and lost their housing during

³The 2017 Durham County Community Health Needs Assessment can be found at <http://healthydurham.org/cms/wp-content/uploads/2018/03/2017-CHA-FINAL-DRAFT.pdf>.

their hospitalizations. Institutionalization, including hospitalization, is sometimes considered an intervention opportunity (Herman et al., 2011; Thornton, Koshiba, & Lee-Ibara, 2017). However, this is often for individuals who had homeless episodes prior to hospitalization. Metraux, Byrne, and Culhane (2010) demonstrated that 28% of first-time entrants into the New York City homeless single adult shelter system had exited an institutional setting within 90 days prior. Medicaid-reimbursed hospitalizations were associated with an increased likelihood of episodic shelter stays ($p < 0.05$). However, type of hospitalization (medical vs. psychiatric) is not reported. In their Japan-based study ($n = 114$), Nishio et al. (2017) found that 44.7% of participants self-reported that either an "illness" or "accident such as a traffic accident or crime" had resulted in their current episode of homelessness. The study categorized participants based on mental illness and cognitive ability, but did not categorize illness as physical or mental in nature. Medical conditions are commonly cited as precursors to homelessness by leading homeless advocacy agencies (National Alliance to End Homelessness, 2018; National Health Care for the Homeless Council, 2018). However, few studies demonstrate housing loss during hospitalization for medical reasons. This issue warrants further research.

5.1 | Implications for public health nurses

Public health nurses (PHNs) are uniquely positioned to influence multiple aspects of the care of homeless patients. First, PHNs can assess for and document housing status, and other social determinants of health, with ICD-10 codes. These codes are underutilized which makes identifying homeless persons in EHRs challenging (Biederman et al., 2019). The National Health Care for the Homeless Council (2016) has published a guide to assist with such assessment and documentation. Second, PHNs can advocate for affordable housing solutions for their patients and communities. Also, PHNs can make appropriate referrals by knowing their communities and agency capacities and also knowing about programs that may be needed to fill gaps such as SOAR. Lastly, PHNs can start grassroots movements and establish medical respite programs in such as the one described in this article. Our program leadership comprises three people, two of whom are PHNs. The potential for success of the pilot program described herein was evident early on and in 2015 the three lead authors received the highly competitive Hillman Innovations in Care award. This funding allowed for paid program staff and for expansion from solely medical respite care into a more comprehensive 9-month transitional care program for homeless persons. Durham Homeless Care Transitions accepted 69 patients in the first 2 years and is currently being evaluated.

5.2 | Limitations

This study has several limitations. The sample size was small. The pre/post intervention design meant that we compared the before-and-after statuses of 29 individuals without a benefit of a comparison

group. Because of this, we cannot make causal inference, we are providing the pre- and post-program data and health care utilization patterns. We also used charge and payment data rather than actual costs due to inaccessibility of cost data. The study was limited to a single teaching hospital in the Southeast and community services in the immediate vicinity. These factors may limit the generalizability of our findings. These limitations notwithstanding, this study makes an important contribution to the literature on the value of medical respite programs. Future research should seek to expand on our findings with larger sample sizes, more geographically diverse populations, and comparisons between experimental and control groups. The use of actual costs rather than charge and payment data would give a more accurate picture of the financial benefits of medical respite programs.

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