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Patient Priorities Care Increases Long-Term Service and Support Use: Propensity Match Cohort Study

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ABSTRACT

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Objectives: Patient priorities care (PPC) is an evidence-based approach designed to help patients achieve what matters most to them by identifying their health priorities and working with clinicians to align the care they provide to the patient's priorities. This study examined the impact of the PPC approach on long-term service and support (LTSS) use among veterans.

Design: Quasi-experimental study examining differences in LTSS use between veterans exposed to PPC and propensity-matched controls not exposed to PPC adjusting for covariates.

Setting and Participants: Fifty-six social workers in 5 Veterans Health Administration (VHA) sites trained in PPC in 2018, 143 veterans who used the PPC approach, and 286 matched veterans who did not use the PPC approach.

Methods: Veterans with health priorities identified through the PPC approach were the intervention group (n = 143). The usual care group included propensity-matched veterans evaluated by the same social workers in the same period who did not participate in PPC (n = 286). The visit with the social worker was the index date. We examined LTSS use, emergency department (ED), and urgent care visits, 12 months before and after this date for both groups. Electronic medical record notes were extracted with a validated natural language processing algorithm (84% sensitivity, 95% specificity, and 92% accuracy).

Results: Most participants were white men, mean age was 76, and 30% were frail. LTSS use was 48% higher in the PPC group compared with the usual care group [odds ratio (OR), 1.48; 95% CI, 1.00—2.18; $P = .05$]. Among those who lived >2 years after the index date, new LTSS use was higher (OR, 1.69; 95% CI, 1.04—2.76; $P = .036$). Among nonfrail individuals, LTSS use was also higher in the PPC group (OR, 1.70; 95% CI, 1.06—2.74; $P = .028$). PPC was not associated with higher ED or urgent care use.

Conclusions and Implications: PPC results in higher LTSS use but not ED or urgent care in these veterans. LTSS use was higher for nonfrail veterans and those living longer. The PPC approach helps identify health priorities, including unmet needs for safe and independent living that LTSS can support.

Long-term services and supports (LTSSs) help adults with limitations in activities of daily living and instrumental activities of daily living achieve important goals like being independent, living at home, and engaging in enjoyable activities.[1,2] Home and community-based LTSS better serve individuals' preferences to age in place and are less costly than institutional long-term care.[3] Thus, approaches that promote home and community-based LTSS for older adults at high risk for institutional long-term care are encouraged. Evidence-based approaches can help older adults identify their health priorities for safe and independent living and work with clinicians to align treatments with priorities.

Patient priorities care (PPC) is an evidence-based, patient-centered approach designed to help patients achieve what matters most to them.[4] PPC has 2 steps: (1) a priorities identification step, in which patients are guided to identify their health priorities; and (2) a care alignment step, in which clinicians align current care with the patient's health priorities. The first step guides patients to identify their health priorities including their values (what matters most), health outcome goals, health care preferences, and the "one thing" they want their provider to focus on. In the second step, the clinician considers how current care aligns with health priorities and decides with the patient which care better aligns with the identified priorities.[4] PPC results in less burdensome care and changes in care that align with identified priorities.[4,5] PPC has been successfully piloted in the Veterans Health Administration (VHA) system and patients had better outcomes such as less burdensome care and fewer medications, compared with non-PPC controls.[6] This prior study also described higher use of self-management services and home care to address unmet chronic care needs, but it did not explore the use of formal LTSS, including home and community services provided by the VHA.[6] The PPC approach can help identify health priorities that represent unmet needs for safe and independent living, and support them with home and community-based LTSS. The relation between PPC on LTSS use must be examined to determine for which patients this association is potentially strongest.

Older adults who are frail, multimorbid, and have limited life expectancy are more frequent users of LTSS.[7] Frailty increases the risk of adverse outcomes like hospitalization, nursing home admission, and death.[8-15] LTSS can benefit patients who are frail or seriously ill because they provide needed services and support at home to address unmet care needs recognized by clinicians.[16,17] Less is known about the recognition of unmet needs that could be addressed by home and community-based LTSS in older, multimorbid patients without obvious frailty or limited life expectancy.[16] An approach like PPC may facilitate the recognition of health priorities to address unmet needs for safe and independent living among multimorbid older adults who are not frail or seriously ill. A potential concern related to PPC is that more attention to patient-driven goals may distract from guidelines-based disease management, which could result in disease exacerbations and greater emergency or acute care services.[18] To address this concern, a study evaluating the relation of PPC and LTSS use should consider the effect on the "balancing measures" of emergency room and inpatient use.

Training in the PPC approach was provided to social workers through the National Social Work in Patient Aligned Care Teams (PACT) Staffing Program with support from the Office of Rural Health. The target population was Veterans from rural or highly rural areas who may have limited access to social work services in the primary care setting at VHA facilities. Although PACT social workers provide services to all Veterans who access primary care, this program places emphasis on those living in rural areas and those with complex and/or chronic conditions that may be exacerbated by challenges related to social determinants of health (SDOH). This program focuses on proactive and timely intervention for Veterans with SDOH barriers to improve health outcomes in rural settings. As social workers are often the first clinicians to engage with a Veteran and develop rapport, they are uniquely qualified to simultaneously provide services while preparing for potential challenges and crises.

We use a quasi-experimental design to study the relationship of PPC on LTSS use among Veterans. We hypothesized that patients engaged in the PPC approach will use more LTSS compared with those not involved in the PPC approach. In addition, the study evaluates how frailty and severe illness (measured by limited life expectancy) affect the use of LTSS when social work professionals use PPC and whether LTSS use has an unintended effect on emergency or urgent care use. We hypothesize that identification of unmet needs through the PPC approach will increase use of home and community-based LTSS without increasing emergency and urgent care use.

Methods

The VHA National Social Work Program in partnership with the Office of Rural Health supported training 144 social workers in PPC across 17 sites with large rural populations in 2018 and 2019. The current article uses information from the first year of this initiative to explore the impact of PPC on LTSS use.

Study Design and Participants

This is a propensity-matched, quasi-experimental study designed to examine the effect of PPC on the use of LTSS in the VHA using information documented in the electronic medical record (EMR) by social work professionals trained in the PPC approach. In 2018, a group of 56 social workers in 5 VHA system locations received structured training on the PPC approach. They used this approach with patients to identify their health priorities and document them in the EMR. A more detailed description of the training process has been published elsewhere.[19] Sociodemographic information, health care service use information, and clinical data of Veterans who completed the PPC approach were extracted from the EMR. A comparison group was identified by matching Veterans who did not participate in the PPC approach cared for by the same social workers. Data were extracted from the VHA Corporate Data Warehouse using VHA Informatics and Computing Infrastructure (VINCI).[20] We used data from 5 VHA locations across the United States. The study protocol was approved by the Research & Development Committee of the Michael E. DeBakey VA Medical Center and Baylor College of Medicine Institutional Review Board.

To be eligible for the current study, veterans needed to meet the following criteria: (1) had a visit with one of the trained social

workers (identified as the index date), (2) had more than 2 primary care physician visits within the VHA system before the index date (to signify a regular user of VA primary care), and (3) were 60 years or older. We used a previously validated natural language processing (NLP) algorithm to identify notes that documented the use of the PPC approach. This NLP algorithm had 84% sensitivity, 95% specificity, and 92% accuracy in the validation phase compared with manual chart review to identify use of the PPC approach.[19] To reduce selection bias related to social worker preferences for using home and community services, we excluded Veterans for whom the included social workers had never recommended home and community services at any point 2 years before or 2 years after the PPC training window. A total of 409 eligible Veterans seen by PPC-trained social workers and who had PPC documentation in their EMR after the index date constitute the PPC group. Among these, we excluded 266 Veterans assigned to social workers who had never recommended home and community services. The remaining 143 constitute the *intervention group*.

The usual care group (*comparison group*) includes veterans seen by the same social workers after the index date but without a PPC visit (n = 10,874). We excluded veterans assigned to social workers who had never recommended home and community services. The resulting potential pool of usual care patients (n = 4338) was propensity-matched with the PPC group based on the following traits: age, sex, race, body mass index (BMI), and frailty status. The final sample of usual care participants was randomly drawn from eligible propensity-matched patients using a ratio of 1-to-2 for a total of 286 participants.

Study Variables

We defined the *index date* as the visit with the social worker when health priorities were identified. The *baseline period* is defined as 12 months before the index date.

Primary outcome: The primary outcome is the number of new LTSSs used after the PPC intervention visit. We obtained this information by analyzing records 12 months before and after the index date. We identified a select group of LTSSs that includes home and community-based services and supports designed to help adults with their personal care needs and ability to maintain independence.[21] The LTSSs were extracted from outpatient encounters in the EMR if any of the stop-codes listed in Figure 1 were identified.

Balancing measures: Balancing measures include changes in the number of emergency department (ED) and urgent care visits. This information is also obtained by comparing records 12 months before and 12 months after the visit index date. Only information on encounters within the VHA system is included in the analyses.

Sociodemographic and clinical variables: Six age categories (60–64, 65–79, 70–74, 75–79, 80–84, ≥85 years), sex, 3 race categories (white, Black, Others), Hispanic ethnicity (yes vs no), BMI, both as a continuous and a dichotomous variable (mean BMI in kg/m^2 or BMI, ≥30 kg/m^2, yes vs no), VHA station (stations in Michigan, West Virginia, Ohio, Missouri, and New York), location (urban, rural, highly rural, and unknown).

Patient's frailty status: Frailty status was measured using a previously validated electronic health record algorithm for veterans, the VA Frailty Index (VA-FI).[15,22] Three frailty categories are generated and

LTSS Code Description	LTSS Code #
Home Treatment Services	118
Community Residential Care Services	121
Home Based Primary Care by Psychologist	156
Home Based Primary Care by Psychiatrist	157
Foster Home Treatment Services	162
Home Based Primary Care by Physician	170
Home Based Primary Care by Nurse	171
Home Based Primary Care by Physician Extender	172
Home Based Primary Care by Social Worker	173
Home Based Primary Care by Social Therapist	174
Home Based Primary Care by Social Dietitian	175
Home Based Primary Care by Social Clinical Pharmacist	176
Home Based Primary Care by Other	177
VA Adult Day Healthcare	190
Community Adult Day	191
Geriatric Consultation	318 and 319
Dementia Clinic Consultation	320
GERIPACT Evaluation	350
Hospice Care	351
Geriatric Research, Education and Clinical Center (GRECC) Evaluation	352
Palliative Care	353
Hospital In Home Care	354
State Home Adult Day Care	658
Home And Community Based Care Assessment	680
VA Paid Home and Community Based Care Provider	681
VA Referral to Home And Community Based Care	682

LTSS= Long terms services and supports; VHA= Veteran Health Administration; EHR= Electronic Health record;

Fig. 1. LTSS codes extracted from the VHA EHR.

scores range from 0 and 1: robust (<0.1), prefrail (0.1–0.2), and frail (≥0.2).[23] We stratify participants by frailty status to examine LTSS use because the VHA offers supports for patient-provider communication, self-management, and care coordination that can reduce the risks for frailty.[24]

Limited life expectancy: We measured limited (2-year) life expectancy retrospectively. We examined LTSS use and stratified by those who live 2 years or more after the index visit with those who live less than 2 years. This time period has been used before to examine LTSS use in Veterans.[25]

Statistical Analysis

We used the Fisher exact test to evaluate the differences in categorical variables and analysis of covariance to evaluate the differences in continuous variables. We used a 2-sided statistical significance of $P < .05$. Propensity matching for the usual care group was done using the R-package *Matchit*.

We used logistic regression analyses to estimate the odds ratios (OR) and 95% CIs of LTSS use comparing the PPC and usual care groups. We then performed additional analyses to examine if frailty and living longer had an impact on LTSS use. We conducted a stratified analysis based on individuals who lived more than 2 years after the index visit date. In addition, to better understand who used LTSS more, we compared the use of LTSS between frail and nonfrail (robust and prefrail) groups. We also conducted logistic regression analyses to estimate the OR and 95% CI for the balancing measures (ED plus urgent care use) comparing the PPC and usual care groups, adjusting for baseline ED plus urgent care use in the 12 months before the PPC index date. To acquire data from VINCI, we used SQL server management studio v17 (Microsoft). Statistical analyses were performed in SPSS v25 (IBM).

Results

Sample Description Stratified by Intervention Group

The 56 social workers trained in the PPC approach in 2018 had encounters with 11,281 Veterans over the subsequent year. Among these, we identified 143 patients meeting the study eligibility criteria with whom they used the PPC approach. The final study selection included 143 Veterans in the PPC group and 286 in the usual care group. The mean age of all study participants was 76 years. Veterans were mostly non-Hispanic, white men. There were no differences in age, gender, race, or BMI between the PPC and usual care groups (see Table 1). Differences were observed by VHA station and location with most of the PPC group located in rural areas (71%) and most participants in the usual care group located in an urban area (52%). Two-thirds of all participants were nonfrail, with no additional significant differences between the groups.

LTSS Use by Intervention Group

We evaluated the use of LTSS for the 12 months before the PPC index date in both groups. We noted no significant differences in LTSS use between groups during this baseline period (OR, 1.34; 95% CI, 0.90–1.98; $P = .15$). In the 12 months following the index date, we observed significantly higher odds of LTSS use in the PPC group compared with usual care (OR, 1.48; 95% CI, 1.01–2.18; $P = .05$). There was no significant difference in ED or urgent care use between the PPC and usual care groups during this period, adjusted for ED and urgent care use during the baseline period (see Table 2, top half).

Table 1
Characteristics of Participants, Stratified by Use of the PPC Approach and Usual Care

Characteristic	Participant Group		P Value
	PPC Approach	Usual Care	
Number of participants (n)	143	286	
Sex, male, n(%)	139 (97.2)	277 (96.9)	.842
Age, y (±SD)	76.6 (±10.1)	76.7 (±10.0)	.872
Race, n (%)			.952
White	98 (74)	184 (70)	.41
African American	<15 (<1)	29 (11)	.143
Others	26 (20)	51 (19)	.514
Ethnicity-Not Hispanic, n (%)	142 (99.3)	280 (97.9)	.305
Station, n (%)			
Michigan	13 (9.0)	27 (9.4)	.907
West Virginia	<15 (<1)	<15 (<1)	.098
New York	23 (16.1)	58 (20.3)	.296
Ohio	95 (66.4)	134 (46.9)	<.001
Missouri	<15 (<1)	56 (19.6)	.002
Location, n (%)			
Urban	35 (24.5)	148 (51.8)	<.001
Rural	102 (71.3)	133 (46.5)	<.001
Highly rural	<15 (<1)	<15 (<1)	.623
Unknown	5 (3.5)	4 (1.4)	.167
BMI, kg/m² (SD)	28.9 (6.3)	29.3 (6.5)	.716
BMI ≥30 (SD)	118 (41.3)	61 (42.7)	.836
VHA-Frailty Index (VA-FI), n (%)			.852
Nonfrail	95 (66.4)	247 (69.4)	
Frail	48 (33.6)	109 (30.6)	

Life Expectancy

Because LTSS use may vary in older adults with limited life expectancy, we also evaluated LTSS and health care use among participants who lived more than 2 years after the study initiation date (Table 2, bottom rows). In this longer-lived population, there was no significant difference in the use of LTSS during the baseline period (12 months before PPC training) between the PPC and usual care groups ($P = .12$). Among participants who lived more than 2 years, there were significantly higher odds of LTSS use among the PPC group compared with usual care (OR, 1.69; 95% CI, 1.04–2.76; $P = .036$). Among this longer-lived subgroup, there was a trend toward *lower* odds (but not statistically significant) of ED plus urgent care use among the PPC group compared with usual care (OR, 0.57; 95% CI, 0.29–1.13; $P = .106$), adjusted for baseline rates for ED and urgent care use.

Frailty

Figure 2 illustrates the differences in LTSS use among the PPC group compared with usual care, stratified by frailty status. Among patients found to be frail by VA-FI, there was no difference in LTSS use

Table 2
Use of LTSSs, Comparing Usual Care and PPC Approach

Parameters	Usual Care*	PPC	OR (95% CI)†	P Value
Use of LTSS	162 (45.5%)	79 (55.2%)	1.48 (1.00–2.18)	.050
ED and urgent care use	95 (26.7%)	27 (18.9%)	0.68 (0.39–1.19)	.177
Lived ≥2 years				
Use of LTSS	100 (42.0%)	49 (55.1%)	1.69 (1.04–2.76)	.036
ED and urgent care use	69 (29.0%)	17 (19.1%)	0.57 (0.29–1.13)	.106

OR reflects odds of LTSS use among patients in the PPC approach compared with usual care groups.
*Usual care group is propensity-matched by age, gender, race, ethnicity, BMI, Frailty index, station, and social worker.
†OR (95% CI) for ED and urgent care use after PPC index date adjusted for the baseline rate of ED and urgent care use.
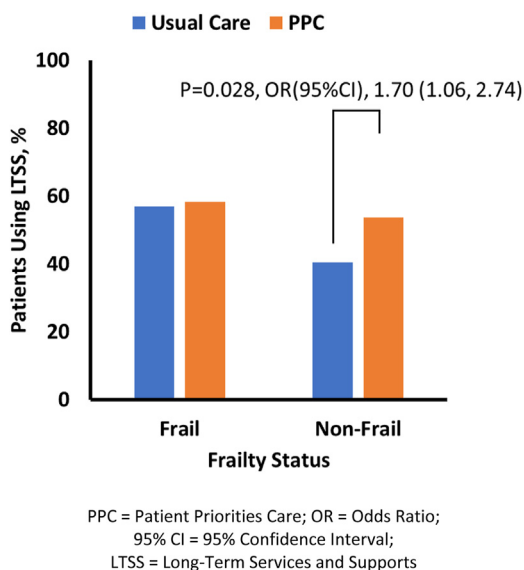
Fig. 2. Percentage of Veterans using LTSSs in the PPC and usual care groups stratified by frailty status.

between PPC and usual care groups (OR, 1.17; 95% CI, 0.57−2.38). Among the nonfrail group, we observed 70% higher odds of LTSS use in the PPC group compared with the usual care group (OR, 1.70; 95% CI, 1.06−2.74; P = .028).

Discussion

In 2016, the VA National Social Work Program in Care Management and Social Work Services, in collaboration with the Office of Rural Health, implemented the Social Work in Patient Aligned Care Teams Program, which funded PACT social workers at sites serving rural and highly rural Veterans. Social workers were trained to use the VA's Social Work Practice Model, which emphasizes comprehensive assessment of social needs in 6 core SDOH domains followed by intervention and ongoing support.

A group of these social workers was trained to incorporate the PPC approach in their care of Veterans starting in 2018. In the current study, the PPC approach was associated with higher use of LTSS compared with usual care in the 12 months following participation in PPC among Veterans meeting study eligibility criteria. The odds of LTSS use among Veterans in the PPC group compared with usual care were greater among those who lived more than 2 years and among those who were nonfrail. No differences between the PPC and usual care groups were seen in ED or urgent care use.

LTSSs are often used for patients with physical or cognitive frailty and those with limited life expectancy.[15-17,26,27] A finding of the current study was that the PPC group has greater odds of LTSS use among those who are nonfrail and lived more than 2 years. One possible explanation is that given the higher risk of hospitalization and nursing home admission of frail older adults,[10,15,28-30] the need for LTSS is better identified by clinicians for frail Veterans and those with limited life expectancy, hence no difference was observed between the groups. Another explanation is that the PPC approach allows nonfrail older adults to share their health goals and care preferences that include priorities related to unmet needs for services to enhance independence and living at home. As a result, referrals for LTSS use are offered to help Veterans meet those priorities. Independent of the reason, the significant increase in LTSS use among nonfrail individuals in the PPC group compared with the usual care group suggests that

LTSS may be used before the onset of frailty and help older Veterans age in place with the appropriate care.

Care coordination and provision of additional services should result in lower acute care use.[31] A barrier to PPC adoption includes concerns from health care providers that PPC might shift focus away from guideline-concordant care and that this shift could increase exacerbations of chronic conditions. Thus, our models include ED and urgent care use as a balancing measure to evaluate the impact of this concern. Our findings show that the increase in LTSS use in the PPC group did not result in increased use of ED or urgent care. Veterans in the PPC group who lived longer had a trend toward lower ED and urgent care use over time. PPC is currently implemented in several institutions across the United States, both inside and outside the VHA system. These findings support previous reports indicating that patient-centered care focused on what matters most to patients does not result in guidelines-discordant care associated with emergency or urgent care and may reduce fragmentation.[4,32]

This study has several limitations. First, we only included information from encounters within the VHA system of Veterans receiving care at one of the selected locations. Hence, our results cannot be generalized to adults outside the VHA system. Within the VHA system, regional variations in available services and care provision may limit our findings including the use of emergency services outside the VA among Veterans. Second, our results focus on home and community-based LTSS only; hence, the impact of PPC on institutionalized adults cannot be evaluated. Third, the narrow gender and race diversity of the study sample and the sample size limits our ability to explore the impact of diversity and equity on LTSS use. Fourth, there may be selection bias, the same factors that lead social workers to use PPC may be associated with the likelihood of using LTSS. We cannot identify why social workers chose to use the PPC approach with the small proportion of patients included in this study. We used propensity matching and strict eligibility criteria to adjust for the variables we could identify a priori; however, the propensity-matching procedure may need to be refined. The differences in characteristics of Veterans by VHA locations suggest that additional variables may be needed for a more homogeneous distribution of cases and controls. Despite these limitations, we examined the impact of PPC on LTSS use in 5 nationally dispersed VHA stations and compared them with matched controls. Our findings, added to existing literature,[33,34] show that PPC can be introduced in geographically diverse dissemination efforts when training and mentoring is offered. Further, pragmatic outcomes of PPC can be measured using automated data extraction from the electronic health record in the VHA health care system.

Conclusions and Implications

The current study demonstrates that PPC implemented by social workers results in successful documentation of what matters most to Veterans. This information can be extracted from the EMR using an automated algorithm and results in higher use of LTSS. These findings occurred across geographically dispersed settings in a national, integrated health system. PPC increases the use of home and community services compared with usual care, especially among nonfrail patients and those without limited life expectancy. Higher use of LTSS should facilitate aging in place for Veterans. These findings add to the evidence base supporting the use of PPC for older adults with multiple chronic conditions. Targeted use of home and community services and supports has the additional benefits of improving function, quality of life, and aging in place—all key features of what matters most to older adults.

Disclosure

The authors declare no conflicts of interest.

Acknowledgments

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