Journal of Health Science & Education
An open access journal
ISSN 2817-1780
eSciRes
ISSN 2817-1780
Original Research
JHSE-1-127

Patient-Centered Medical Home Readiness in the Veterans Health Administration Clinics: Rural - Urban Differences

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Abstract

Introduction: In 2010, the VHA began implementation of the patient centered medical home model (PCMH), known as Patient Aligned Care Team (PACT). This study describes the variability in key attributes of the PCMH model within the VHA system in 2010, prior to the PACT implementation. The objective of this study was to examine whether rural and urban clinics in the VHA were different with regards to structural and process attributes and their baseline readiness for the PACT implementation. **Methods**: The study design was a cross-sectional survey. The surveyed population included physicians and nurse managers, from 848 VHA clinics nationwide. A total of 528 respondents from 427 clinics (50.4%) responded to the survey. The questionnaire addressed facility-level structural characteristics and processes of care, with respect to nine domains that are key elements of the PCMH. The domains were patient-centeredness, continuous relationship, access-to-care, practice-based care team, care coordination, care management, patient self-management, performance measurement and quality improvement and clinical information management. **Results**: More urban clinics provide language accommodations, work with patients to establish treatment goals and care plans have the majority of their patients assigned to a specific patient care team and have a clinical data tracking system. More urban clinics identify patient sub-populations to support population based care management and regularly review patient satisfaction data and use quality improvement methods. **Conclusions**: More urban VHA clinics have the structures and processes in place to facilitate patient-centeredness, care management, population health management, performance measurement and quality improvement. The findings from this study have policy implications by providing a better understanding of the capability of VHA clinics to function optimally as PCMHs. The results point to a need for providing additional infrastructure and support for rural VHA clinics to foster optimal performance.

Keywords: Patient centered medical home; VHA clinics; Survey; Processes of care

Introduction

The Veterans Health Administration (VHA) in the United States (US) has undergone a remarkable transformation in the past two decades. The quality of care provided, that had previously lagged behind the private sector now exceeds the private sector with the VHA scoring higher on national quality measures. Likewise, customer satisfaction in the VHA regularly exceeds that of private healthcare systems [1,2]. The VHA's successful transformation was due to critically important factors, such as reorganization and decentralization of authority; a comprehensive and unified electronic health record (EHR); capitation of funding; regularly-monitored and widely-reported clinical, access, and customer satisfaction performance measures; and a shift from inpatient-focused care to a holistic, outpatient, primary care-centered healthcare delivery model [3-6].

Notwithstanding its success, the VHA is challenged to adopt new models of care not only to continue to improve but also to accommodate an increasingly complex patient population (e.g., wider age-range, increasing numbers of women, etc.). Veterans not only have higher burdens of chronic medical illnesses but also often have co-morbid psychiatric illness and inadequate social support [7]. In rural settings, barriers to access add another challenge to the complexity of caring for veterans.

The American Academy of Family Practitioners (AAFP), the American College of Physicians (ACP) as well as payers and other stakeholders in the United States (US) healthcare systems have advocated the use of the patient centered medical home (PCMH) model as a means to improve effectiveness and timeliness of patient care. The PCMH model "acknowledges that the best quality of care is provided — not in episodic, illness-oriented, complaint-based care — but through patient-centered, physician-guided, cost-efficient, longitudinal care that encompasses and values both the art and science of medicine." [8]. The PCMH model emphasizes addressing barriers to access to care through same-day scheduling, after-hours access, email and telephone visits to replace the face-to-face encounter, and team-based care. However, all of these are dependent on having a sufficient supply of primary care physicians. Shortages of physicians, particularly in rural areas can be a barrier to the successful implementation of PCMH. In 2007, it was estimated that the ratio of PCPs to population in urban areas was 100 to 100,000 population. However, in urban areas it was only 46 per 100,000 population [9]. While 21% of the U.S. populations live in rural areas, only 10% of physicians practice in rural areas [10]. This geographic maldistribution of the physician workforce could be a challenge to implementing the PCMH model in rural clinics. Clinic size has also been found to be associated with the early adoption of the PCMH model by physician practices, with large group practices and those

owned by hospitals and HMOs, having higher levels of PCMH infrastructure than smaller groups [11]. In rural areas, medical practices tend to be smaller and hence may have fewer resources that could affect their ability to adopt and implement the PCMH model.

In 2010, the VHA began implementation of the PCMH, known as PACT (Patient Aligned Care Team). The degree of readiness for the medical home implementation in the VHA, particularly whether rural and urban VHA clinics were different in terms of their readiness for PACT implementation is not known. The objective of this study was to determine the readiness of VHA clinics to implement key attributes of the PCMH and to assess if there were rural-urban differences in the attributes.

Methods

Sample description

The data for this study were collected using a secure online survey completed by clinic personnel from VA affiliated primary care clinics. The clinics included VA Medical Centers, community-based outpatient clinics (CBOCs), and VA-contracted primary care clinics. Clinic healthcare providers, including physicians and nurse managers, from 848 VHA clinics in the United States were invited to participate. Providers included physicians, physician assistants and advanced practice registered nurses. Of the 848 VA-affiliated primary clinics, 492 (58.0%) were classified as urban, 324 (38.2%) as rural, and 32 (3.8%) as highly rural. The zip code of the primary care clinic was used to designate urban, rural, or highly rural location using the definition used by Tricare [12]. Rural primary care clinics were defined as any ZIP code with fewer than 1,000 persons per square mile, and remote rural as zip codes with less than seven persons per square mile.

Survey design and content

The research team examined the peer-reviewed and gray literature (including non-peer reviewed industry sources such as professional association websites) on the PCMH model and reviewed current definitions in publications and on medical association websites to identify a meta-set of defining elements of the PCMH model, with potential usefulness in both the VHA and the private healthcare sectors. Four PCMH models were identified, including: Centers for Medicare and Medicaid Services (CMS) Medical Home standards and elements to medical home capabilities [13], National Committee for Quality Assurance (NCQA) PPC®-PCMH standards and guidelines [14], TransforMEDSM Patient-Centered Medical Home Model [15] and the Commonwealth Fund's PPC®-PCMH standards [16]. All of these surveys focus more on the structural attributes of the PCMH. The survey developed in this study addressed both structural and process attributes of PCMH.

The "meta-set" of PCMH elements identified from the literature review was used to guide the design of the survey questionnaire. The survey questions elicited facility-level information on the structural and process characteristics that were key elements of the PCMH. The instrument was pilot-tested and adjustments were made. The final questionnaire consisted of 63 closed-ended questions related to nine domains: Patient-centeredness, continuous relationship, access-to-care, practice-based care teams, care coordination, care management, patient self-management, performance measurement and quality improvement (PM/QI), and clinical information management (CIM). The survey contained no uniquely identifying information to ensure anonymity of the participants. The survey was granted exempt status by the concerned institutional review boards. After VA IRB approval and VHA National Union review and concurrence, the questionnaire was administered from January 2010 through May 2010.

Data analysis

The survey responses were descriptively summarized using frequencies and percentages. The unit of analysis was the individual clinic. The individual survey responses were weighted by the number of responses to reflect single clinics. Chi-square tests were used to assess differences among sub-sets and Fisher's exact test was used in situations where a large sample approximation was inappropriate. A significance level of $p<0.05$ was considered significant for all tests. The Cronbach's alpha coefficient for internal consistency for each of the nine domains was estimated. The data were analyzed using SAS 9.2 software (SAS Institute Inc., Cary, NC).

Results

A total of 528 respondents from 427 clinics nationwide responded to the survey. The unit of analysis was the individual clinic. The 427 clinics represented 50.4% of all VHA primary care clinics. Of the 427 clinics, 259 (60.7%) were classified as urban, 156 (36.5%) as rural, and 12 (2.8%) as highly rural.

Patient-centeredness

The Cronbach's alpha coefficient for the domain of Patient-centeredness was 0.73. There were no statistically significant differences between rural and urban clinics for any assessments of communication barriers or preferences, or for most of the accommodations made for communications barriers. However, more respondents from urban clinics (n=303; 97.7%) than respondents from rural clinics (n=185; 93.0%) indicated that identified communication barriers are "always", "most of the time," or "sometimes" documented in patient records ($p<0.01$). Furthermore, a higher proportion of respondents from urban clinics (n=130; 48.8%) than rural clinics (n=83; 33.7%) indicated that accommodations for communication barriers related to language are provided to patients ($p<0.01$). Only 10% of all the providers surveyed reported using secure email to communicate with patients. Table 1 summarizes the statistically significant differences between rural and urban clinics.

	Total		Rural		Urban		
	N	**% (95% CI)**	**N**	**% (95% CI)**	**N**	**% (95% CI)**	**p-value**
Patient-Centeredness							
Documentation of identified communication barriers and preferences in patient record							
Always/Most of the time/Sometimes	488	96.2 (94.5, 97.8)	185	93.0 (89.3, 96.8)	303	97.7 (96.1, 99.3)	0.009**
Rarely/Never	23	3.8 (2.2, 5.5)	14	7.0 (3.2, 10.7)	9	2.3 (0.7, 3.9)	
Accommodations are provided by clinic for patients with communication barriers							
Language							
Yes	228	43.8 (39.3, 48.4)	70	33.7 (27.0, 40.5)	158	48.8 (42.9, 54.7)	0.001**
No	300	56.2 (51.6, 60.7)	135	66.3 (59.5, 73.0)	165	51.2 (45.3, 57.1)	
Continuous Relationship							
Patients capable of switching primary care provider							
Yes	508	97.0 (95.4, 98.5)	192	94.6 (91.3, 98.0)	316	98.1 (96.5, 99.7)	0.038*
No	16	3.0 (1.5, 4.6)	10	5.4 (2.0, 8.7)	6	1.9 (0.3, 3.5)	
Practice-based Care Teams							
Proportion of patients assigned to a specific patient care team							
More than 90%	211	83.8 (79.0, 88.6)	73	76.5 (67.1, 85.9)	138	87.1 (81.6, 92.5)	0.042*
Less than 90%	41	16.2 (11.4, 21.0)	19	23.5 (14.1, 32.9)	22	12.9 (7.5, 18.4)	
Care Coordination							
Providers work with patients to establish treatment goals and create a plan of care for managing chronic conditions or targeted risk factors							
Always/Most of the time/ Sometimes	458	94.6 (92.6, 96.6)	177	91.0 (86.7, 95.3)	281	96.4 (94.3, 98.5)	0.014*
Rarely/Never	29	5.4 (3.4, 7.4)	16	9.0 (4.7, 13.3)	13	3.6 (1.5, 5.7)	
Population-based Care Management							
Clinical data tracking system provides trending information for aggregate clinic lab or clinical values							
Yes	150	29.9 (25.5, 34.3)	48	22.3 (16.4, 28.2)	102	33.6 (27.8, 39.5)	0.008**
No	378	70.1 (65.7, 74.5)	157	77.7 (71.8, 83.6)	221	66.5 (60.5, 72.2)	
Clinic identifies any specific patient sub-populations to support population-based care management							
Yes	236	55.7 (50.5, 60.9)	75	44.2 (36.2, 52.1)	161	61.2 (54.6, 67.8)	0.002**
No	192	44.3 (39.1, 49.5)	88	55.8 (47.9, 63.8)	104	38.8 (32.2, 45.4)	
Performance Measurement							
Clinic reviews data on patient satisfaction							
At each clinic visit/At planned intervals/Once a year	399	92.8 (90.4, 95.3)	145	88.2 (83.0, 93.3)	254	95.1 (92.5, 97.7)	0.010*
Rarely/Never	35	7.2 (4.7, 9.6)	20	11.8 (6.7, 17.0)	15	4.9 (2.3, 7.5)	
Quality Improvement							
Clinic uses defined improvement methods (e.g., VA TAMMCS, LEAN, Six Sigma, or PDSA rapid cycle changes) at the clinic level							
Yes	184	61.0 (55.3, 66.7)	59	49.8 (40.2, 59.4)	125	66.1 (59.1, 73.0)	0.007**
No	127	39.0 (33.3, 44.7)	57	50.2 (40.6, 59.8)	70	33.9 (27.0, 40.9)	
*p < 0.05 **p <0.01							

Table 1: Structural characteristics and processes: Patient centered medical home attributes in VHA clinics.

Continuous relationship

The Cronbach's alpha coefficient for the domain of Continuous Relationship was 0.44. There was no statistically significant difference between rural and urban responses with regard to patient access to their own primary care provider on the same day as requested and in the ability to self-select the primary care provider between rural and urban VHA-affiliated primary care clinics. However, a higher proportion of urban respondents (n= 316; 98.1%) than rural respondents (n= 192; 94.6%) indicated that patients are able to switch primary care providers at their clinic ($p < 0.05$).

Access to care

The Cronbach's alpha coefficient for the domain of Access to Care was 0.41. There were no statistically significant differences between rural and urban clinics in same day scheduling, response time for non-emergent telephone inquiries during and after office hours, and the process for non-emergent telephone enquiries after office hours. In addition, almost all of the respondents indicated that their clinic has a standardized process in place to respond to telephone inquiries that are non-emergent during office hours (96.2%) and after office hours (89.1%).

Practice-based care teams

The Cronbach's alpha coefficient for the domain of Practice-Based Care Teams was 0.60. About half (55.1%) of the respondents indicated that patient care is organized around defined care teams. Of those who indicated that their clinic organizes care around care teams, the majority (90.7%) indicated that a leader is "always", "most of the time," or "sometimes" clearly identified within primary care teams. A significantly higher proportion of respondents from urban clinics (87.1%) than respondents from rural clinics (76.5%) indicated that more than 90% of the clinic's patients are assigned to a specific care team ($p<0.05$).

Care co-ordination

The Cronbach's alpha coefficient for the domain of Care Coordination was 0.70. There were no statistically significant differences between rural and urban clinics in the implementation of key PCMH elements related to care coordination within the VHA system. The majority (92.0% of the respondents) indicated that their clinic or primary care team is notified within two days regarding details of care received within the VHA system, and 84.5% of the respondents also indicated that their clinic has a process in place to coordinate appointments such that patient trips to the clinic are minimized. Almost two-thirds (63.7%) of the respondents indicated that their clinic monitors patient referral information indicated and that their clinic has a system for tracking timeliness of completion of consults to specialists within the VHA system (63.5%). A total of 361 (73.4%) of the respondents indicated that their clinic has a system for tracking transitions in care, including alerts for when the patient is admitted as an inpatient. There were also no statistically significant differences between rural and urban clinics in the implementation of PCMH elements related to care coordination outside the VHA system. Overall, almost two-thirds of the respondents (62.7%) indicated that their clinic or primary care team is notified within two days regarding details of care received outside the VHA system. A third of the respondents (32.5%) indicated that their clinic has a system for tracking the timeliness of completion of consults to specialists outside the VA system. Almost all of the respondents (99.1%) indicated that the primary care provider or clinic representative asks patients if they have non-VA healthcare providers. A total of 356 (72.1%) of the respondents indicated that the non-VA healthcare provider contact information is documented in the patient's medical record. Almost two-thirds (65.8%) of the respondents indicated that their clinic develops a co-management plan with the non-VA provider for dual care patients.

Care management

The Cronbach's alpha coefficient for the domain of Care Management was 0.55. There were no statistically significant differences between rural and urban clinics in the implementation of the majority of PCMH elements related to individual-based care management. However, a higher proportion of urban respondents (96.4%) than rural respondents (91.0%) indicated that providers work with patients to establish treatment goals and create a plan of care for managing chronic conditions or targeted risk factors ($p<0.05$).

Population-based care management

The Cronbach's alpha coefficient for the domain of Population-Based Care Management was 0.77. There were statistically significant differences between rural and urban clinics in the implementation of PCMH structural characteristics and processes related to population-based care management. Specifically, a higher proportion of respondents from urban clinics (n=102; 33.6%) than respondents from rural clinics (n=48; 22.3%) indicated that the clinical data tracking system within their clinic provides trending information for aggregate clinic lab or clinical values ($p<0.01$). Additionally, a significantly higher proportion of respondents from urban clinics (n=161; 61.2%) than respondents from rural clinics (n=75; 44.2%) indicated that their clinic often identifies patient sub-populations to support population-based care management ($p<0.01$).

Patient self-management

The Cronbach's alpha coefficient for the domain of Patient Self-Management was 0.64. Patient self-management occurs when patients and/or their family members are encouraged to actively participate in decision making and self-managing their illness. Over two-thirds of the respondents (64.4%) indicated that clinic providers within their clinic discuss behavioral expectations with patients. Additionally, the majority of the respondents (90.1%) indicated that clinic providers within their clinic encourage patients to become involved in the treatment decision-making process. Rural versus urban differences in patient self-management characteristics were not statistically significant.

Clinical information management

The Cronbach's alpha coefficient for the domain of Clinical information management (CIM) was 0.29. CIM refers to the appropriate use of information technology to support optimal patient care, performance measurement, patient education and self-management, and enhanced communication. Almost all (98.7%) of the respondents indicated that an up-to-date problem list is kept in the patient's medical record. The majority of the respondents (84.3%) also indicated that their clinic supports or encourages patient use of electronic personal health records and use standardized note templates (n=366; 76.7%) Rural versus urban respondent differences in CIM were not statistically significant.

Performance measurement and quality improvement

The Cronbach's alpha coefficient for the domain of Performance Measurement and Quality Improvement was 0.77. A higher proportion of respondents from urban clinics (n=254; 95.1%) than respondents from rural clinics (n=145; 88.2%) indicated that their clinic reviews data on patient satisfaction ($p<0.05$). A significantly higher proportion of respondents from urban clinics (n=125; 66.1%) than respondents from rural clinics (n=59; 49.8%) also indicated that their clinic uses defined improvement methods (e.g., VA TAMMCS, LEAN, Six Sigma, or PDSA rapid cycle changes) at the clinic level ($p < 0.01$). Furthermore, a higher proportion of respondents from urban clinics (n= 260; 86.3%) than respondents from rural clinics (n= 147; 77.9%) indicated that personnel from their clinic meet to discuss clinical performance and quality improvement ($p <0.05$).

Discussion

Patient-centered care is delivered to individual patients through a defined systematic approach and enhanced

communication. A defined systematic approach to deliver patient-centered care includes: setting and monitoring individualized treatment goals, regular ongoing communication with the patients and/or their families and providing comprehensive health assessments. Enhanced communication is available through new options for communication between patients, their personal provider, and practice staff. It also includes identifying and providing support for cultural and language barriers. This study found that VA clinics in 2010, widely adopted the attributes of patient-centeredness by assessment of communication barriers. However, although the assessment is performed, the provision of accommodations for those communication barriers is not so widespread, indicating a gap between assessment of the need and the actual provision of accommodations. Further, urban clinics more often provided accommodations for barriers to language than rural clinics. This probably points to rural clinics not having sufficient resources, such as interpreter services, as compared to urban clinics. It is also significant to note that only 10% of all providers surveyed in 2010, prior to the PACT implementation reported using secure email to communicate with patients. An early evaluation of the PACT implementation found that there was an increase in electronic messaging to providers from 0.01% to 2.3% of patients [17]. The study found that primary care staffing levels and phone and electronic encounters increased in the first 30 months of PACT implementation. However, no rural-urban differences in implementation were reported in this evaluation.

A continuous relationship in the PCMH model occurs when each patient has an ongoing relationship with a personal physician and a consistent care team. Although there were no rural-urban differences in the ability to self-select the primary care provider, a higher proportion of urban respondents indicated that patients are able to switch primary care providers at their clinic. This may be reflective of a higher availability of physicians in urban clinics, whereas rural clinics may have less staffing or even a sole provider, so that Veteran patients are unable to switch providers, even if they want to. This finding has significant implications for continuity of care and a continuous relationship with a provider. Prior research has shown that Veterans who report having an established relationship with a VHA provider are less likely to be high users of dual care [18]. It will also be interesting and important to examine the impact of the PACT implementation on continuity of care and the continuous relationship with a VHA provider.

Regarding access to care, enhanced access-to-care is provided in the PCMH model through defined systems and policies for scheduling, triage, and visit support. This study found that there is widespread adoption in VHA clinics of a standardized process to respond to telephone enquiries that are non-emergent both during and after clinic hours. The study findings did not substantiate any statistically significant rural/urban differences in implementation of key attributes of the PCMH within the access-to-care domain.

Care coordination refers to a collaborative relationship where there are defined processes for effective communication among all providers within and outside of the referent health system must exist; and care must be facilitated by tools and/or technologies to track patient data and records in order to ensure that patients receive appropriate and timely care. The practice-based care team in the PCMH model is led by a clinical care provider, usually a physician. Effective communication is fundamental in a practice-based care team. Additionally, defined patient panels are assigned to each team where the assignments are clear and match the team's capabilities. The implementation of the different attributes of the domains of practice-based care teams and coordination of care within and outside the VA system are also fairly widespread, with no statistically significant differences noted between rural and urban clinics within these domains. However, respondents from urban clinics reported the majority of their patients being assigned to a specific patient care team.

Care management refers to an individual as well as to a population-based approach to care. The attributes of care management, both individual patient and population based, were also found to be widely adopted among the VHA clinics. Urban clinics, however, more often establish treatment plans and create plans of care for patients with chronic conditions and risk factors and also more often identify patient sub-populations to support population based care management, than their rural counterparts. These rural urban differences could also be reflective of more availability of resources to clinics in urban areas. One of the challenges in the implementation of PACT has been the hiring and training of clinical staff. As of 2012, the primary care RN vacancy rate was 7% [17]. Rural VHA clinics are likely to be more affected by staffing shortages, due to the historical difficulty in recruiting and retaining providers in rural areas [19].

There is a systems-based approach to performance measurement and quality improvement in the PCMH model. Providers are engaged in performance measurement and improvement where safety measures as well as all aspects of care improvement are continuously identified, tracked, and reviewed. Additionally, information technology is utilized appropriately to support performance measurement and improvement. Performance measurement/quality improvement and clinical information management practices were reported as being widely adopted in VA primary care clinics, although respondents reported that they do not always work well, indicating that there is room for improvement in these domains of PCMH implementation for both rural and urban VA clinics. More urban clinics regularly review patient satisfaction data and use QI methods such as VA TAMMCS, Lean, Six Sigma, or PDSA rapid cycle changes. Again, this may be a reflection of resource availability. Resources may include available staff time to devote to QI and performance measurement activities.

Finally, the major transformation instituted by the VHA in the 1990s, including the use of electronic health records (EHRs), data gathering around evidence-based clinical practice, and customer satisfaction, [5,6] were found to be widely adopted among both rural and urban VHA clinics. These practices align with some of the key PCMH implementation characteristics and may well provide an advantage to the VHA over the private sector in the adoption of the PCMH model of primary healthcare delivery. However, rural clinics in 2010 lagged behind urban clinics in have some of the process attributes of the PCMH and this could be a reflection of resources, both staffing and training, in rural

VHA- affiliated clinics. These findings could also be attributed to their generally smaller size. In a 2008 study, Rittenhouse et al. [11], found that size was associated with key attributes of the PCMH [11]. Shortell et al. [20], note that smaller practices will require considerable support and technical assistance to function optimally as medical homes [20]. Rural health care needs diverse and specialized skills, and providers in general, have access to fewer diagnostic and treatment resources than those in urban areas [21]. Success in major transformative efforts in rural health care delivery, such as the PCMH would require dedicated resources directed to rural areas. For the VHA, this could mean resources such as staffing, training and technical support, specifically targeted to the rural VHA-affiliated clinics.

The initial VHA-PACT implementation was found to be slow and there was considerable variation in the PACT rollout across facilities. However, there were no specific descriptions of rural urban differences in implementation, which continued in a phased manner until 2014. Subsequent evaluations, following the completion of PACT implementation may throw further light on this issue.

The limitations of this study are the lack of follow up data to relate these baseline findings with regards to rural – urban differences to the subsequent PACT implementation in rural and urban settings. The relatively low (50%) response rate has the potential for non-response bias. However, the frequency of rural vs. urban clinics was similar in the overall and respondent samples, thus making the respondent sample representative of the population of VHA clinics.

Conclusions

Prior to the VHA's PACT implementation in 2010, there was reasonably widespread prevalence of the majority of the key PCMH attributes in VHA clinics. There also were significant areas in which rural and urban VHA clinics differed in their readiness for the PCMH and these merit further examination, in terms of targeted efforts to maximize the beneficial effects of the PACT implementation. More urban VHA clinics already had the structures and processes in place to facilitate patient-centeredness, care management, population health management, performance measurement and quality improvement. The findings from this study have policy implications by providing a better understanding of the capability of VHA clinics to function optimally as PCMHs. The results point to a need for providing additional infrastructure and support for rural VHA clinics to foster optimal performance.

Acknowledgements

The funding for this study was provided by the Department of Veterans Affairs, Veterans Health Administration, Office of Research and Development. The funding agreement ensured the authors' independence in designing the study, interpreting the data, writing, and publishing the report. The views expressed are solely those of the authors and do not necessarily represent those of the Department of Veterans Affairs.

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Received date: January 12, 2018; **Accepted date:** February 28, 2018; **Published date:** March 07, 2018

Citation: Nayar P, Nguyen AT, Woodbridge P, Fetrick A (2018) Patient-Centered Medical Home Readiness in the Veterans Health Administration Clinics: Rural - Urban Differences. *J Health Sci Educ* 2(1): 127.