Nurturing 21st Century Physician Knowledge, Skills and Attitudes with Medical Home Innovations: The Wright Center for Graduate Medical Education Teaching Health Center Curriculum Experience

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Purpose Effect of patient centered medical home (PCMH) curriculum interventions on residents' self-reported and demonstrated knowledge, skills and attitudes (KSA) in PCMH competency arenas is lacking in the literature. This study aimed to assess impact of PCMH curricular innovations on Internal Medicine residents' self-reported KSA.
Method Twenty four (24) Internal Medicine residents - 12 Traditional (TR) track and 12 Teaching Health Center (THC) track - began training in academic year (AY) 2011 at the Wright Center for Graduate Medical Education (WCGME). They were followed through AY2013 covering three years of training. PCMH curricular innovations were applied beginning July 2011 until May 2012 focally to THC residents. These curricular innovations were spread program wide in May 2012. Semi-annual validated PCMH Clinician Assessments assessing PCMH competencies based on self-reported KSA were started in AY2011 and completed by all residents.
Results Mean self-reported KSA scores of TR residents were similar to THC residents at baseline for all PCMH competencies. In May 2012, mean scores of THC residents were significantly higher than 2011 and graduating 2009 TR residents for most PCMH competencies. After program wide implementation of PCMH innovations, mean scores of 2011 and 2010 TR residents for all PCMH competencies improved and most equalized to those of 2011 THC residents. Globally improved PCMH competency scores of 2011 THC and TR residents were maintained through May 2014, with majority of improvements above baseline reaching statistical significance.
Conclusions: PCMH curricular innovations inspired by HRSA's Teaching Health Center funded residency program expansion quickly and consistently improved Internal Medicine residents' self-reported KSA of PCMH competencies and improvements were sustained.

Title page

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ABSTRACT

Purpose Effect of patient centered medical home (PCMH) curriculum interventions on residents' self-reported and demonstrated knowledge, skills and attitudes (KSA) in PCMH competency arenas is lacking in the literature. This study aimed to assess impact of PCMH curricular innovations on Internal Medicine residents' self-reported KSA.

Method Twenty four (24) Internal Medicine residents - 12 Traditional (TR) track and 12 Teaching Health Center (THC) track - began training in academic year (AY) 2011 at the Wright Center for Graduate Medical Education (WCGME). They were followed through AY2013 covering three years of training. PCMH curricular innovations were applied beginning July 2011 until May 2012 focally to THC residents. These curricular innovations were spread program wide in May 2012. Semi-annual validated PCMH Clinician Assessments assessing PCMH competencies based on self-reported KSA were started in AY2011 and completed by all residents.

Results Mean self-reported KSA scores of TR residents were similar to THC residents at baseline for all PCMH competencies. In May 2012, mean scores of THC residents were significantly higher than 2011 and graduating 2009 TR residents for most PCMH competencies. After program wide implementation of PCMH innovations, mean scores of 2011 and 2010 TR residents for all PCMH competencies improved and most equalized to those of 2011 THC residents. Globally improved PCMH competency scores of 2011 THC and TR residents were maintained through May 2014, with majority of improvements above baseline reaching statistical significance.

Conclusions: PCMH curricular innovations inspired by HRSA's Teaching Health Center funded residency program expansion quickly and consistently improved Internal Medicine residents' self-reported KSA of PCMH competencies and improvements were sustained.

INTRODUCTION:

The 21st century marks a period of dramatic shift in health care paradigms in the United States. Health care costs in the United States have grown exponentially [1], but are not paralleled by improvements in health care delivery efficiencies, public health outcomes, physician skill development or patient satisfaction with health care experiences [2, 3]. Patient centered medical home (PCMH) shows promise as a quality, team based and population health focused model of innovative primary care delivery that may potentiate value enhancement in health care delivery with reduction in costs and improved health outcomes [4, 5, 6]. PCMH enthusiasm has prompted many professional organizations, stakeholders, and policy-makers [7] to work at national, state, and local levels to ensure integration of this innovative strategy in primary care practices and promote pursuit of National Committee for Quality Assurance (NCQA) PCMH certification. Ongoing systems of measurement and process change in support of the implementation of high PCMH standards can enhance quality, cost-effectiveness and outcomes-focused care [8, 9].

Authentic transformation of health care delivery models requires a change in the skill sets of primary care providers [10, 11, 12, 13, 14, 15]. In a study by Kaiser Permanente, skill sets of routine office-based competencies including chronic disease management, care coordination, care continuity, familiarity with team-based care models, clinical information technology, leadership and management skills, and systems thinking were reported as deficient in newly trained physician workforce [16]. Responsively, various components of Affordable Care Act

legislation have aimed to address the national shortage and mal-distribution of physicians, to inspire new skill sets production and to reduce related health disparities. One legislative example is the Teaching Health Center Graduate Medical Education (THCGME) Program implemented by the Health Resources and Services Administration (HRSA). In 2011, THCGME pioneering grantees included nine Family Medicine, one dental and one Internal Medicine residencies [17, 18]. The Wright Center for Graduate Medical Education (WCGME) is the sponsoring institution for the ACGME accredited Internal Medicine residency in the initial cohort of THCGME programs.

WCGME sought to align educational processes with reform mandates, THCGME funding intent and local community need. The resulting comprehensive curricular redesign increased training time in ambulatory care settings including FQHC exposure, provided focused PCMH and leadership didactics and aligned engagement in ambulatory care based continuous quality improvement projects. This study provides evidence of changes in residents' self-reported KSA of PCMH competencies in support of the teaching health center based curriculum that aligns graduate medical education with the complexities of health care reform and patient care needs.

MATERIALS AND METHODS:

On approval of this prospective cohort study by the Institutional Review Board of the Wright Center, informed consent was obtained from each participating resident. Measures were implemented to ensure anonymity of resident participants and assessment data they provided throughout the study duration. Since AY 2011, all Internal Medicine residents completed semi-annual PCMH Clinician Assessments, as well as other data collection tools.

Setting: PCMH based didactics enhancements and resident engagement in reflective CQI within ambulatory venues with or pursuing NCQA PCMH certification were focally applied to 2011 THC residents from training initiation in July 2011 and were spread program wide in May 2012. Innovations specifically applied to THC residents from start of training also included increased block continuity clinic exposure split between a Wright Center for Primary Care (WCPC) and a proximal FQHC with an intentional ratio of 50% ambulatory and 50% hospital based rotations. In contrast, TR residents continued with historical half day/week continuity clinic exclusively at WCPC and had 30% ambulatory and 70% hospital based rotation exposure. Continuity ambulatory and hospital rotational exposure models remained different between 2011 THC and TR training tracks of study participants for the entire three years.

Participating Residents: WCGME recruited 12 THC and 12 TR residents to start Internal Medicine training in AY2011. Those reporting definitive interest in ambulatory medicine were assigned to the THC track and those uncertain or interested in hospitalists or specialty careers were randomly assigned to the THC or TR track. One 2011 THC resident left the program in January 2014 and one 2011 THC resident had a 3 month training delay so will be graduating off cycle in September 2014. During the study period, 10 and 12 TR residents, who started training in 2009 and 2010 respectively, completed training and graduated (2009 and 2010 TR Graduating Seniors).

PCMH Curricular Innovations: In addition to increased and FQHC expanded block based continuity clinic exposure, THC residents were exposed to enhanced PCMH based didactics, clinic team huddles and CQI ambulatory projects. Weekly team huddles identified care delivery deficits for which THC residents helped design and implement team based remediations. CQI projects were developed and shared as part of Pennsylvania Academy of Family Practice's

Improving Performance in Practice Residency Program/Community Health Center Collaborative with monthly team calls and quarterly learning sessions. The didactic curriculum was augmented to include weekly PCMH based interactive sessions for THC track residents including topics on PCMH delivery model, Quality Improvement fundamentals, Population Management, EMR Meaningful Use, Team Skills and Leadership.

From July 2011 until May 2012, these didactic interventions were applied focally only to THC residents. Because THC residents consistently outperformed TR cohort colleagues and TR 2009 Graduating Senior Residents in most PCMH competencies by end of AY2011, PCMH curricular innovations were spread program wide beginning in May 2012. Future AY recruits were all integrated into the new, balanced THC clinical exposure model with block ambulatory time spilt between a WCPC and proximal FQHC. Mandatory clinical training curricular enhancements in Women's Health, Oral Hygiene and Primary Care Psychiatry were added in AY2012 only for THC residents.

Assessment details: Demographic details including age, gender, country of origin, prior residency training, completion of other advanced degrees such as masters of public health (MPH) or doctoral degrees, prior US clinical experience, prior research experience and year of medical school graduation were compared between 2011 THC and TR residents at baseline.

Semi-annual November and May validated PCMH Clinician Assessments were completed by all Internal Medicine residents at WCGME since 2011. This PCMH Clinician Assessment assesses nine PCMH competencies: 1) Team Approach, 2) Information System Support, 3) Self-Management Support, 4) Use of Guidelines, 5) Quality Improvement, 6) Population Management, 7) Care Coordination, 8) Patient Centered Care, and 9) Treatment of

Mental Health Issues. Each assessment question has self-rated score options from 1-5, with 1 denoting limited and 5 denoting superior competency. The cronbach's alpha for each of the PCMH competencies were > 0.8.

The analysis focused on the 2011 cohort of THC and TR Residents (12 in each group) as a comparative platform to assess historical and new curriculum innovations. In total, 2011 THC and TR residents completed six assessments from November 2011 thru May 2014. We compared four assessments longitudinally within and between the 2011 THC and TR tracks from the following time points: 1) Baseline Assessment (November 2011); 2) End of first training year (May 2012); 3) Second year of training (November 2012); 4) Graduation assessment near training completion (May 2014).

2011 THC and TR residents' scores in May 2012 and near graduation in May 2014 were also compared with 2009 and 2010 TR Graduating Seniors' scores in May of their respective graduation years. Rationale for this analysis is that 2009 and 2010 TR Graduating Seniors were trained prior to implementation of THC PCMH innovations, noting that 2009 TR graduates had no direct exposure to curriculum innovations described and 2010 TR graduates had one year of exposure after program wide rollout of curricular innovations. The 2009 and 2010 TR trainees completed two and four PCMH Clinician assessments respectively.

STATISTICAL ANALYSIS:

Data was expressed as mean ± standard deviation for continuous variables and number (%) for categorical variables. Data distribution normality was assessed using the Kolmogorov-Smirnov test. Considering small sample sizes, our data were predominantly non-normally distributed so non-parametric tests were used for all comparisons. Due to non-parametrically distributed data,

continuous variables were compared between groups using Wilcoxon rank sum test. Categorical variables were compared between groups using chi-squared test. Mean group based scores for PCMH competencies assessed were compared longitudinally for both 2011 THC and TR residents over 3 years of training at the above defined time points, with comparisons to just prior and baseline scores. Between groups cross-sectional comparisons of mean individual and global PCMH competencies scores at the defined time points were done for 2011 THC and TR cohort residents. Similar between group cross sectional comparisons for each 2011 cohort's mean individual and global scores in May of their internship and graduation year were also done with near graduation May surveys of 2009 and 2010 TR residents in their respective graduation year. All analyses were performed using STATA 11 statistical software. $P < 0.05$ was considered statistically significant.

RESULTS

Response rates for all assessments were 100%. Demographic comparisons detailed in Table 1 showed 2011 THC residents were older and completed medical school earlier than TR resident peers (Table 1). Gender distribution, country of origin, prior residency training, advanced degrees, prior US clinical and research experiences were similar (Table 1).

Longitudinal within Groups 2011 THC and TR Residents Comparison: Compared to November 2011 baseline, May 2012 THC residents' assessments showed mean scores improvement for all PCMH competencies except Patient Centered Care. THC mean scores for all individual and global PCMH competencies improved from baseline on the May 2014 assessments, with majority of improvements reaching statistical significance. (Table 2)

Unlike THC peers, TR residents' mean scores in May 2012 remained similar to November 2011 baseline without improvement for most PCMH competencies. May 2014 TR scores did show significant improvement in all PCMH competencies with improvements above baseline for Team Approach, Self-Management Support, Quality Improvement, Population Management and Treatment of Mental Health Issues reaching statistical significance. (Table 3)

Between Groups PCMH Competencies Scores Comparison Baseline assessments showed similar performance in all PCMH competencies when 2011 THC residents were compared to 2011 TR peers (Table 4). May 2012 assessments showed 2011 THC residents consistently scored higher in most and global PCMH competencies than TR peers and 2009 TR Graduating Seniors (Table 4; Figure 1, Supplemental Table 1; Supplemental Figure 1). Because of notable May 2012 performance improvement of 2011 THC residents in most PCMH competencies above baseline and superior performance above 2011 TR peers and 2009 TR Graduating Seniors, PCMH curricular innovations were spread program wide at this time. However to preserve continuity exposure, the redesigned training model of increased block based ambulatory continuity split between a WCPC and proximal FQHC was not spread program wide at this time as program leadership opted for phased roll out for this training model for all new interns starting in AY2012.

Although the November 2012 PCMH competencies assessment completed six months after program-wide spread of PCMH curriculum innovations revealed 2011 TR residents showed global but not statistically significant improvement in PCMH competencies from baseline, TR mean scores did equalize for all PCMH competencies with THC colleagues at this time and remained comparable to THC peers through May 2014. (Figure 1, Table 4)

2011 THC residents mean scores for most PCMH competencies in May 2014 were consistently better for most and global PCMH competencies than 2009 TR Graduating Seniors in May 2012 with 5 of 9 PCMH competencies improvements reaching statistical significance. (Supplemental Table 2; Supplemental Figure 2) Similar to THC peers, near completion of their training in May 2014, 2011 TR residents scored significantly higher in 4 of 9 PCMH competencies compared to the May 2012 assessment completed by 2009 graduating TR seniors. (Supplemental Table 3) Notably, both 2011 THC and TR mean scores in May 2014 were essentially similar to May 2013 scores on near graduation May assessments completed by 2010 TR graduating seniors (Supplemental Table 2, 3; Supplemental Figure 3, 4), the latter of whom did have one year of direct exposure to PCMH curriculum innovations in their senior year.

DISCUSSION:

Our study shows that multi-dimensional PCMH based curricular innovations in the WCGME's Internal Medicine residency significantly enhanced THC residents' self-reported KSA by the end of their internship year and that these improvements over baseline were maintained through three years of training. Subsequent program wide implementation of PCMH curricular innovations in May 2012 enhanced PCMH competencies and self-reported KSA in both 2011 and 2009 TR residents as well within a similar timeframe.

Effect of PCMH innovations on patient outcomes, care delivery organizational structure and cost effectiveness have been debated in the literature [19, 20, 21, 22]. Hochman et. al [23] showed that after one year of PCMH interventions, using NCQA's PCMH certification tool, residents' satisfaction with experience of patient care improved significantly with enhanced perception that patients received comprehensive care at their facility. However, effect of PCMH

curricular innovations on residents' self-reported and demonstrated KSA of PCMH competencies is scant. Our study provides evidence that intentional PCMH curricular innovations can improve residents' self-reported KSA in arenas reported as deficient in Kaiser Permanente's survey [16].

Amidst all of the implemented PCMH curricular innovations and increased ambulatory care center exposure during three years of residency training, our program was sensitive to the potential distraction from the traditional Internal Medicine residency training focus that ensures broad, specialty specific medical knowledge acquisition. Prior research [24] compared our 2011 THC and TR residents' first -In-Training Exam (ITE) performance, an objective metric assessing comprehensive Internal Medicine medical knowledge. In this assessment, 2011 THC residents performed similar to TR counterparts in all specialties except for slight underperformance in Pulmonary/Critical Care Medicine. Notably, 2011 THC residents performed significantly better than TR peers in Endocrinology ($P = 0.021$) [24]. Presumed due to exposure to diabetes care as a ubiquitous PCMH target population, this potential to increase Endocrinology knowledge offers promise in enhancing physician knowledge to counter our national diabetes epidemic.

Though earlier small sample studies showed enhanced patient outcomes with the PCMH model [19, 20], a recent large study by Friedberg et al [21] showed limited improvement in quality and no improvement in health care utilization or cost effectiveness among multiple practices that adopted this model for three years, suggesting further refinement is necessary in PCMH interventions [21]. Financial sustainability of PCMH interventions in current form is unknown. As a result, PCMH model modifications are probable in the future. Creation of a physician work force with deeper understanding of core PCMH principles offers promise to make knowledgeable and adaptable physician leaders prepared to lead PCMH evolution to

promote ongoing care delivery transformation in pursuit of the Institute for Healthcare Improvement's Triple Aim.

Limitations

Our study had advantages of prospective design and follow-up through the three year training cycle of 23/24 engaged 2011 THC and TR residents with a consistent 100% response rate. Small sample size was a limiting factor precluding multivariate comparisons and control for obvious confounders including higher age and longer length of time since medical school graduation in 2011 THC residents. Admittedly, our methods only assessed residents' self-reported KSA demonstrative of PCMH Competencies which have not been causally linked to demonstration of these competencies in patient care delivery or actuated improvements in health outcomes. There remains a need to explore the relationship between enhanced residents' self–reported KSA with milestones guided, competency based evaluations and direct observation tools as required by the ACGME's Next Accreditation System, as well as with enhanced patient care delivery processes and health outcomes.

Method of recruitment based on THC track self-selection may have added selection bias as primary care focused Internal Medicine residents who chose the THC track may have been more oriented and committed to developing PCMH competencies. However, this selection bias seems unlikely given similar baseline assessment scores for THC and TR residents. Additionally, after program wide implementation of PCMH based curricular innovations, even without change in TR half day continuity clinic/week and 30% ambulatory/70% hospital based rotational exposure, 2011 TR residents and 2010 graduating TR seniors showed similar improvement in most PCMH competencies.

Cross track diffusion of didactic and CQI exposure enhancements by peer to peer education and program wide PCMH based curricular innovations in AY2012 may have diluted detectable comparative effectiveness of the innovations on training track cohorts. Finally, contemporary clinical learning environment exposure of TR residents during half day and one block continuity clinic rotation to THC residents well acclimated to ambulatory learning venues may have also diluted detectable effectiveness of curricular interventions.

Conclusions

HRSA's THCGME funding catalyzed curricular innovations in The Wright Center's Internal Medicine Residency program. These innovations increased and enhanced PCMH based didactics, engagement in ambulatory based CQI projects, and training time in ambulatory care centers. PCMH curricular innovations enhanced residents' self- reported KSA of PCMH competencies. Improvements occurred within six months and were replicated after curriculum spread within the same timeframe to TR residents despite their continuing in the historical training model of half day weekly continuity clinics with 30% ambulatory and 70% hospital based training exposure.

Notable improvements in self-reported KSA of PCMH competencies above baseline and compared to prior 2009 TR graduates were sustained over three years of training. Correlation of residents' self-reported KSA of PCMH competencies with competency-based global 360 evaluations, direct observation tools, and ACGME reportable milestones outcomes, as well as patient care delivery process and health outcomes, are required before firm inferences can be made from our results. The Next Accreditation System offers a relevant, data-driven roadmap of educational and patient care outcomes for these validations. Overall, WCGME THC

Consortium's Internal Medicine residency program inspires hope for a better prepared 21st century physician workforce than previously reported by Kaiser Permanente in 2011 [16].

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Disclaimer: No disclaimers

Previous presentations: Results of the first year were presented at Regional American College of Physicians' Poster Session in April 2013 and at the National Association of Community Health Centers' (NACHC) Community Health Institute Poster Session in August 2013.

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Table 1: Baseline Demographic Characteristics of 2011 THC and 2011 TR Residents

	2011 THC Residents (n = 12)	2011 TR Residents (n = 12)	P-value
Age (yrs)	34 [5.5]	31 [3]	0.008
Males- n (%)	6 (50)	7 (58)	1.000
Country of origin			0.515
India- n (%)	6 (50)	7 (58)	
Egypt – n (%)	3 (25)	0 (0)	
USA – n (%)	1 (8)	2 (17)	
China – n (%)	1 (8)	2 (17)	
Syria – n (%)	0 (0)	1 (8)	
Libya – n (%)	1 (8)	0 (0)	
Yrs. since medical school grad. (yrs)	8 (4)	4 (3.5)	0.001
Prior residency training – n (%)	10 (83)	7 (58)	0.185
Advanced degrees – n (%)	3 (25)	5 (42)	0.333
Prior clinical experience – n (%)	12 (100)	11 (92)	0.500
Prior research experience – n (%)	7 (58)	8 (67)	0.500

Table 2: Longitudinal PCMH Competencies 2011 THC Residents Comparison to Baseline

Competency	Nov 2011 n=12	May 2012 n=12	P value	Nov 2012 n=12	P-value	May 2014 n=11	P value
Care Coordination	4.0 (3.5 – 4.5)	4.7 (4.3 – 5.0)	0.039	4.3 (3.9 – 4.7)	0.106	4.7 (4.4 – 4.9)	0.031
Info System Support	3.5 (3.2 – 3.8)	4.4 (4.0 – 4.7)	0.001	3.9 (3.7 – 4.2)	0.113	4.5 (4.2 – 4.8)	0.001
Patient Centered Care	4.2 (3.7 – 4.7)	4.1 (3.7 – 4.5)	0.283	4.2 (3.6 – 4.8)	0.558	4.6 (4.3 – 4.9)	0.092
Population Management	3.8 (3.4 – 4.2)	4.6 (4.1 – 4.9)	0.001	4.5 (4.1 – 4.9)	0.022	4.6 (4.3 – 4.9)	0.028
Quality Improvement	4.0 (3.6 – 4.5)	4.3 (3.9 – 4.7)	0.094	4.5 (4.2 – 4.9)	0.039	4.6 (4.3 – 4.9)	0.037
Self-Man Support	4.1 (3.5 – 4.6)	4.5 (4.1 – 4.8)	0.021	4.5 (4.3 – 4.9)	0.047	4.5 (4.2 – 4.8)	0.057
Team Approach	3.8 (3.4 – 4.3)	4.6 (4.3 – 5.0)	0.001	4.5 (4.2 – 4.9)	0.001	4.4 (4.0 – 4.7)	0.016
Mental Health Tx	4.4 (3.8 – 4.9)	4.9 (4.5 – 5.0)	0.041	4.7 (4.4 – 5.0)	0.296	4.6 (4.3 – 4.9)	0.314
Use of Guidelines	4.2 (3.7 – 4.7)	4.5 (4.2 – 4.9)	0.089	4.4 (4.1 – 4.8)	0.217	4.6 (4.3 – 4.9)	0.100

Table 3: Longitudinal PCMH Competencies 2011 TR Residents Comparison to Baseline

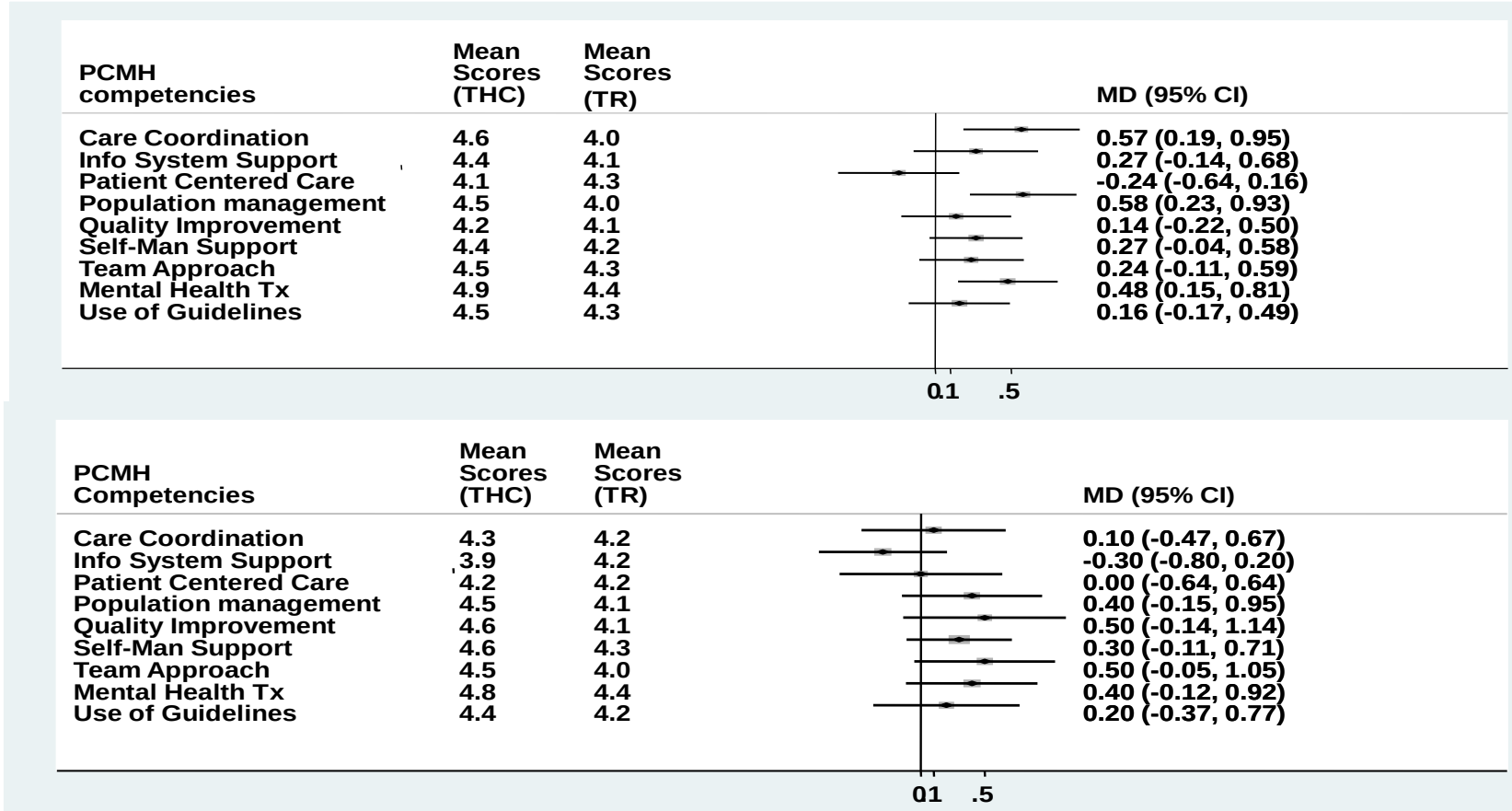
Competency	Nov 2011 n=12	May 2012 n=12	P value	Nov 2012 n=12	P-value	May 2014 n=12	P value
Care Coordination	4.1 (3.5 – 4.7)	4.1 (3.6 – 4.5)	0.833	4.2 (3.7 – 4.6)	0.625	4.3 (3.7 – 4.9)	0.225
Info System Support	3.9 (3.0 – 4.0)	4.2 (3.8 – 4.6)	0.068	4.2 (3.6 – 4.7)	0.109	4.3 (3.6 – 4.9)	0.053
Patient Centered Care	4.3 (3.8 – 4.7)	4.4 (4.0 – 4.7)	0.532	4.2 (3.8 – 4.6)	0.812	4.4 (3.5 – 4.9)	0.719
Population Management	3.6 (3.0 – 4.3)	4.0 (3.5 – 4.3)	0.094	4.1 (3.6 – 4.6)	0.077	4.2 (3.5 – 4.8)	0.021
Quality Improvement	3.8 (3.1 – 4.5)	4.1 (3.5 – 4.5)	0.561	4.1 (3.5 – 4.8)	0.104	4.3 (3.7 – 4.8)	0.033
Self-Man Support	4.0 (3.5 – 4.3)	4.2 (3.5 – 4.5)	0.735	4.3 (4.0 – 4.7)	0.113	4.5 (4.0 – 5.0)	0.017
Team Approach	3.8 (3.5 – 4.5)	4.3 (4.0 – 4.9)	0.199	4.0 (3.5 – 4.6)	0.784	4.4 (3.9 – 5.0)	0.038
Mental Health Tx	4.0 (3.3 – 4.7)	4.4 (4.0 – 4.8)	0.187	4.4 (4.0 – 4.8)	0.172	4.5 (4.1 – 5.0)	0.036
Use of Guidelines	4.2 (3.7 – 4.5)	4.4 (4.0 – 4.8)	0.116	4.2 (3.7 – 4.7)	0.978	4.5 (4.0 – 4.9)	0.136

Table 4: PCMH competencies compared between THC residents (n = 12) and TR Residents (n = 12)

	November 2011			May 2012			November 2012		
	THC	**TR**	**P-value**	**THC**	**TR**	**P-value**	**THC**	**TR**	**P-value**
Care Coordination	4.0 (3.5 – 4.5)	4.1 (3.5 – 4.7)	0.428	4.7 (4.3 – 5.0)	4.1 (3.6 – 4.5)	0.025	4.3 (3.9 – 4.7)	4.2 (3.7 – 4.6)	0.660
Info System Support	3.5 (3.2 – 3.8)	3.9 (3.0 – 4.0)	0.107	4.4 (4.0 – 4.7)	4.2 (3.8 – 4.6)	0.177	3.9 (3.7 – 4.2)	4.2 (3.6 – 4.7)	0.082
Patient Centered Care	4.2 (3.7 – 4.7)	4.3 (3.8 – 4.7)	0.382	4.1 (3.7 – 4.5)	4.4 (4.0 – 4.7)	0.392	4.2 (3.6 – 4.8)	4.2 (3.8 – 4.6)	0.537
Population Management	3.8 (3.4 – 4.2)	3.6 (3.0 – 4.3)	0.173	4.6 (4.1 – 4.9)	4.0 (3.5 – 4.3)	0.036	4.5 (4.1 – 4.9)	4.1 (3.6 – 4.6)	0.115
Quality Improvement	4.0 (3.6 – 4.5)	3.8 (3.1 – 4.5)	0.225	4.3 (3.9 – 4.7)	4.1 (3.5 – 4.5)	0.091	4.5 (4.2 – 4.9)	4.1 (3.5 – 4.8)	0.210
Self-Man Support	4.1 (3.5 – 4.6)	4.0 (3.5 – 4.3)	0.491	4.5 (4.1 – 4.8)	4.2 (3.5 – 4.5)	0.047	4.5 (4.3 – 4.9)	4.3 (4.0 – 4.7)	0.307
Team Approach	3.8 (3.4 – 4.3)	3.8 (3.5 – 4.5)	0.651	4.6 (4.3 – 5.0)	4.3 (4.0 – 4.9)	0.039	4.5 (4.2 – 4.9)	4.0 (3.5 – 4.6)	0.137
Mental Health Tx	4.4 (3.8 – 4.9)	4.0 (3.3 – 4.7)	0.251	4.9 (4.5 – 5.0)	4.4 (4.0 – 4.8)	0.163	4.7 (4.4 – 5.1)	4.4 (4.0 – 4.8)	0.126
Use of Guidelines	4.2 (3.7 – 4.7)	4.2 (3.7 – 4.5)	0.815	4.5 (4.2 – 4.9)	4.4 (4.0 – 4.8)	0.711	4.4 (4.1 – 4.8)	4.2 (3.7 – 4.7)	0.534

	May 2014		
	THC	**TR**	**P value**
Care Coordination	4.7 (4.4 – 4.9)	4.3 (3.7 – 4.9)	0.268
Info System Support	4.5 (4.2 – 4.8)	4.3 (3.6 – 4.9)	0.811
Patient Centered Care	4.6 (4.3 – 4.9)	4.4 (3.5 – 4.9)	0.515
Population Management	4.6 (4.3 – 4.9)	4.2 (3.5 – 4.8)	0.297
Quality Improvement	4.6 (4.3 – 4.9)	4.3 (3.7 – 4.8)	0.319
Self-Man Support	4.5 (4.2 – 4.8)	4.5 (4.0 – 5.0)	0.372
Team Approach	4.4 (4.0 – 4.7)	4.4 (3.9 – 5.0)	0.382
Mental Health Tx	4.6 (4.3 – 4.9)	4.5 (4.1 – 5.0)	0.560
Use of Guidelines	4.6 (4.3 – 4.9)	4.5 (4.0 – 4.9)	0.502

Figure 1



PCMH Competencies Comparison of 2011 THC and 2011 TR Residents May 2012 and Nov 2012