

Health Coaching by Medical Assistants Improves Patients' Chronic Care Experience

David H. Thom, MD, PhD, MPH; Danielle Hessler, PhD; Rachel Willard-Grace, MPH; Denise DeVore, BA; Camille Prado, BA; Thomas Bodenheimer, MD, MPH; and Ellen H. Chen, MD

The provision of high-quality, patient-centered primary care for patients with chronic conditions has been identified as a priority for US healthcare.¹ A widely used model for improving care is the Chronic Care model (CCM),² which is based on 6 elements identified from an extensive literature review of interventions: self-management support, decision support, delivery system design, clinical information systems, healthcare organization, and community resources. The CCM has been broadly applied as a model for improving chronic care and has been linked to better outcomes of care.³ Many studies have examined interventions to improve the quality of care under the CCM, including practice redesign,⁴ specially trained practice nurses,⁵ and telemedicine support.⁶ The key elements of the CCM are part of the primary care medical home movement,^{7,8} which has demonstrated success in improving quality of care and patient satisfaction while holding down costs.⁹⁻¹¹

One approach to improving the quality of chronic care is the use of health coaches as part of the healthcare team.¹² Health coaching by health workers or peers trained as coaches has emerged as an effective model to improve the management of several chronic conditions, including asthma in children,¹³ as well as diabetes,¹⁴⁻¹⁶ hypertension,^{17,18} or a combination of cardiovascular risk conditions¹⁹ in adults. Health coaches incorporate functions of patient education, navigation, collaborative goal setting, and personal support,^{20,21} which are all components of the CCM.

In contrast to health educators, health coaches help patients choose health goals and create action plans to achieve those goals, in addition to supporting the patient in achieving those goals. Health coaches frequently have contact with patients outside of medical visits, and while they do provide substantial emotional support, they are not therapists. In contrast to case managers who are usually health professionals (eg, registered nurses, pharmacists), health coaches can be

ABSTRACT

Objectives: We sought to test the hypothesis that training medical assistants to provide health coaching would improve patients' experience of care received and overall satisfaction with their clinic.

Study Design: Randomized controlled trial.

Methods: Low-income English- or Spanish-speaking patients aged 18 to 75 years with poorly controlled type 2 diabetes, hypertension, and/or hyperlipidemia were randomized to receive either a health coach or usual care for 12 months. Patient care experience was measured using the Patient Assessment of Chronic Illness Care (PACIC) scale at baseline and at 12 months. Patient overall satisfaction with the clinic was assessed with a single item asking if they would recommend the clinic to a friend or family member. PACIC and satisfaction scores were compared between study arms using generalized estimating equations to account for clustering at the clinician level.

Results: PACIC scores were available from baseline and at 12 months on 366 (76%) of the 441 patients randomized. At baseline, patients receiving health coaching were similar to those in the usual care group with respect to demographic and other characteristics, including mean PACIC scores (3.00 vs 3.06) and the percent who would "definitely recommend" their clinic (73% and 73%, respectively). At 12 months, coached patients had a significantly higher mean PACIC score (3.82 vs 3.13; $P < .001$) and were more likely to report they would definitely recommend their clinic (85% vs 73%; $P = .002$).

Conclusions: Using medical assistants trained in health coaching significantly improved the quality of care that low-income patients with poorly controlled chronic disease reported receiving from their healthcare team.

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Take-Away Points

The Chronic Care Model (CCM) has been widely applied to the transformation of primary care. Health coaching can incorporate functions of the CCM, including patient education, navigation, collaborative goal setting, and personal support. We found that medical assistants trained as health coaches substantially improved patient-reported quality of care under the CCM, as measured by the Patient Assessment of Chronic Illness Care (PACIC) in a randomized controlled trial.

- Mean PACIC scores (range 1 to 5) increased over 12 months from 3.00 to 3.83 in the coached group versus from 3.06 to 3.13 in the usual care group, an effect size of 0.77 which was highly significant ($P < .001$).
- The proportion of patients reporting they would definitely recommend their clinic to family and friends increased from 73% to 85% in the coached group, but was unchanged in the usual care group ($P = .002$).
- We conclude that medical assistants trained as health coaches can substantially improve patient-reported quality of care received from their healthcare team and satisfaction with their clinic.

unlicensed members of the support staff, such as medical assistants or health workers, who are more likely to be culturally and linguistically concordant with patients. Medical assistants—one of the fastest growing allied health professions²²—are likely to be available in primary care practices,^{23,24} so we sought to assess the extent to which medical assistants trained as health coaches could improve the quality of care received by the patient based on the CCM.

METHODS

Study Design

The Health Coaching in Primary Care (HCPC) study was a randomized controlled trial of 12 months of health coaching versus usual care for low-income patients with uncontrolled type 2 diabetes, hypertension, and/or hyperlipidemia. Patients who received health coaching were more likely to achieve the primary outcome of control for 1 or more of the conditions for which they were enrolled.¹⁹ In this paper, we reported on the effect of health coaching on patient-reported quality of care received from their primary care clinic, as well as satisfaction with their clinic.

Setting, Participants, Enrollment, and Randomization

A detailed description of the HCPC study design and methods has previously been published.²⁵ Briefly, the study was conducted at 2 safety net clinics in San Francisco from March 2011 to May of 2013. Patients were considered eligible if they were between the ages of 18 and 75 years, spoke Spanish or English, could be reached by phone, and had poorly controlled diabetes (glycated hemoglobin $>8\%$), hypertension (systolic blood pressure ≥ 140 mm Hg), or hyperlipidemia (low-density lipoprotein ≥ 160 mg/dL for patients without diabetes or ≥ 100 mg/dL for patients with diabetes). A total of 664 eligible patients were identified at the 2

clinic sites, of which 441 (66.4%) consented and were enrolled (see **Figure**). After enrollment and completion of baseline measures, participants were randomized to the health coaching arm ($n = 224$) or the usual care arm ($n = 217$) by opening the next randomly ordered, sealed envelope.

Health Coaching Intervention

The health coaches included 3 certified medical assistants who attended 40 hours of health coach training over 6 weeks using a curriculum developed by the study team that included instructions on using active listening and nonjudgmental communication; helping with self-management skills for diabetes, hypertension, and hyperlipidemia; providing social and emotional support; assisting with lifestyle change; facilitating medication understanding and adherence; navigating the clinic; and accessing community resources.

Training incorporated aspects of the CCM,² Motivational Interviewing,²⁶ and the Transtheoretical Model.²⁷

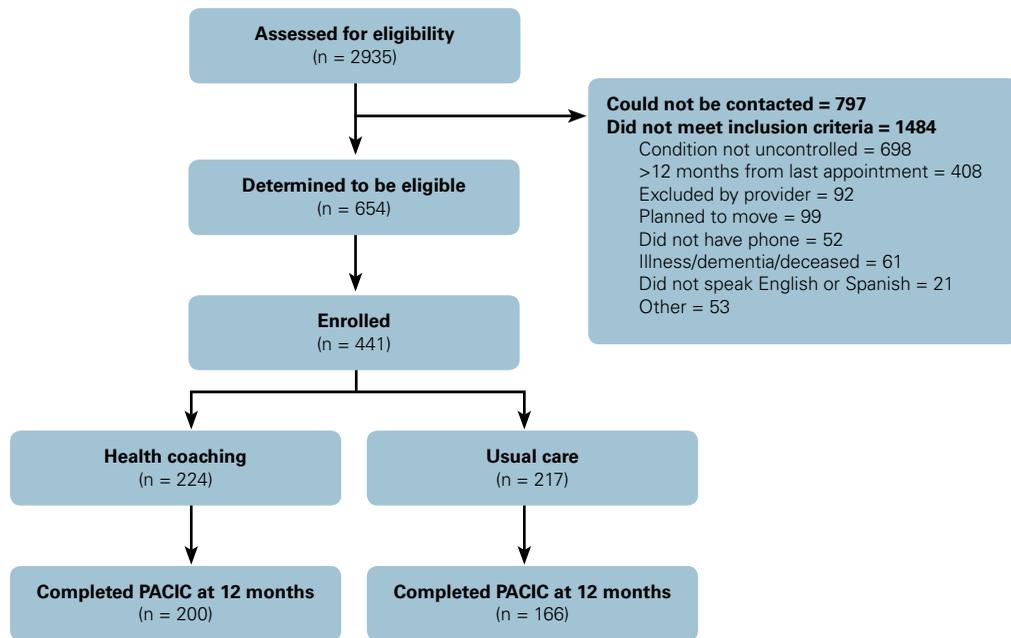
Health coaches interacted with patients at medical visits, individual visits, and by phone calls. The minimum required frequency of contact was once every 3 months for in-person visits (often as part of a medical visit) and monthly for additional contacts such as phone calls. The health coach met with the patient before the visit for medication reconciliation, agenda-setting, and the review of lab numbers; usually stayed in the exam room during the medical visit and met with the patient afterward to review the care plan and check for patient understanding; and assisted the patient in making action plans²⁸ to increase physical activity, improve healthy eating, reduce stress, or improve medication adherence. In addition, the health coach facilitated navigation of other resources, such as diagnostic imaging or referrals to specialists, by making follow-up appointments or facilitating introductions to behaviorists or other clinic resources.

After each contact with a patient, the health coach reported the type of contact (phone, medical visit, or in-person visit with the health coach only), approximate length of the visit, and topics covered from a list of possible activities (eg, review medication adherence, create or follow-up on an action plan).

Usual Care

Patients randomized to usual care continued to have visits with their clinician over the course of the 12-month period and had access to any additional resources that were

■ **Figure.** CONSORT Diagram



CONSORT indicates *Consolidated Standards of Reporting Trials*; PACIC, Patient Assessment of Chronic Illness Care (scale).

part of usual care at the clinic, including diabetes educators, nutritionists, chronic care nurses, or educational classes.

Measures

Patient demographic characteristics were assessed by survey at the time of enrollment and at 12 months. Quality of care received was assessed by patient report using the previously validated Patient Assessment of Chronic Illness Care (PACIC) scale.²⁹⁻³² The PACIC scale measures patient-reported receipt of services included in the CCM over the past 6 months using a 5-point Likert-type response scale ranging from 1 (“almost never”) to 5 (“almost always”). Three examples of items are: “Asked to talk about your goals in caring for your condition,” “Helped to make a treatment plan that you could carry out in your daily life,” and “Contacted after a visit to see how things were going.” The PACIC scale has been associated with increased physical activity, receiving appropriate laboratory assessments,²⁹ greater engagement in all self-management behaviors, and higher quality of life.³⁰ Scores are reported as the mean Likert score (range = 1-5) for all 20 items, as well as scores for each of the 5 domains (patient activation, delivery system design/decision support, goal-setting items, problem-solving/contextual counseling, and follow-up/coordination). Patient satisfaction with their primary care clinic was as-

essed by a single item: “How likely would you recommend your clinic to your friend or relative?” with a response scale from 1 (“definitely not recommend”) to 5 (“definitely recommend”) and analyzed as a dichotomous variable (“definitely recommend” vs “not definitely recommend”).³³

Statistical Analysis

Analyses were in accordance with the Consolidated Standards of Reporting Trials (CONSORT) guidelines for reporting results from clinical trials.^{34,35} Group comparisons were conducted using χ^2 test for categorical data and analysis of variance for normally distributed continuous variables. PACIC data were treated as missing if less than two-thirds of the items were answered. Effect size (Cohen’s *d*) was calculated as the difference in change in PACIC score divided by the pooled standard deviations from both study arms at baseline and 12 months.³⁶ Unadjusted change in PACIC scores between study arms was compared using *t* tests, while differences in the proportion of patients reporting they would definitely recommend their clinic at 12 months were compared using χ^2 testing. Generalized Estimating Equation models were used to account for clustering by clinician and to additionally control for baseline levels of the outcome. All *P* values are 2-sided. The primary analysis was done without replace-

ment of missing data (data assumed to be missing at random). Analyses were repeated using multiple imputation to test the assumption of missing at random using NORM version 2 software,³⁷ which imputes data through the expectation-maximization algorithm. All other statistical analyses were performed using SPSS version 19.0 (SPSS Inc, Chicago, Illinois).

RESULTS

The PACIC score was available at 12 months for 200 (89%) of the 224 patients enrolled in the health coaching arm and 166 (76%) of the 217 patients enrolled in the usual care arm. Patients with missing data were more likely to be in the usual care arm and more likely to speak Spanish, but otherwise did not differ significantly from patients without missing data.

On average, health coaches had a mean of 12.4 interactions with patients over the 12-month period. Nearly half of (45%) the interactions occurred during meetings between the health coach and patient while slightly over a quarter occurred during a medical visit (29%) or as a phone call (26%). The average length of interaction was approximately 15 minutes for phone calls, 30 minutes for individual meetings, and 45 minutes for medical visits (including time spent in the room during the patient visit with their clinician). The most common topics discussed during interactions were medications (75%), reviewing clinical values such as blood pressure and laboratory test results (60%), and discussing lifestyle changes such as health eating and physical activity (59%).

Study participants in each study arm were similar with respect to demographic characteristics (Table 1). Over two-thirds (69%) were Spanish-speaking, 57% had less than a high school education, and 88% reported a household income of less than \$20,000 in the past year.

The mean overall PACIC scores were nearly identical in the 2 study arms at baseline but increased by 0.83 for patients assigned to receive health coaching compared with 0.07 in the usual care group (effect size = 0.79) (Table 2). This pattern was seen in all 5 domains of the PACIC, with the greatest difference in the patient activation domain. Similarly, the proportion of patients who reported they would highly recommend their primary care provider was similar at baseline but increased significantly more in the health coach group. The differences remained significant after adjustment for baseline levels of the PACIC score and satisfaction, and for clustering by clinicians.

When the association between health coaching and PACIC scores was examined separately for English- and

Spanish-speaking participants, a significant difference (interaction) was found, with the association being substantially stronger in the Spanish-speaking group ($P < .01$) even after controlling for differences in baseline PACIC scores, which were lower in Spanish-speaking patients compared with English-speaking patients (2.94 ± 1.04 vs 3.21 ± 0.96). The effect size for the PACIC score was 1.00 ($P < .001$) for Spanish-speaking participants compared with 0.40 for English-speaking participants (P value not significant). This pattern was seen across all 5 PACIC domains and for the measure of patient satisfaction with their clinic. Repeating the analyses using imputed data did not materially affect the results.

DISCUSSION

Health coaching has been shown to improve chronic disease management and the use of health coaches in primary care has become more popular.^{20,21} To our knowledge, this is the first study to show that adding health coaching by a trained member of the patient care team also improves patients' reported overall quality of care and satisfaction with their clinic. Other studies have looked at interventions to improve PACIC scores, but they have not utilized unlicensed personnel, have not emphasized health coaching techniques, and have generally found smaller improvements in PACIC scores.

Previous studies have examined other interventions aimed at improving quality of chronic care as measured by the PACIC. One study, using practice nurses to implement components of the CCM for patients with diabetes found no improvement in PACIC scores.⁵ Another study of a guided care intervention by practice nurses, based on the CCM, for patients aged over 65 years with complex chronic conditions, found an adjusted difference in PACIC score of just 0.2 after 18 months compared with usual care.³⁸ A disease-management program based on the CCM for patients with chronic obstructive pulmonary disease found a small improvement in PACIC score (0.08) compared with the control group (-0.05)³⁹—a result similar to Cramm et al's study of other chronic disease management programs.⁴⁰ Another study, by Schillinger et al, compared automated telephone self-management support or group medical visits to usual care for patients with diabetes and reported effect sizes of 0.51 and 0.53, respectively, for total PACIC score.⁴¹ In our current study, we found that, compared with patients receiving usual care, patients receiving health coaching had a statistically significant improvement in their mean total PACIC score with a standard effect size of 0.77—close to the conventional threshold for a large effect size of 0.8.

Table 1. Demographic Characteristics of Participants by Study Arm at Baseline (all differences are nonsignificant)

| | All Participants | Usual Care Arm | Health Coaching Arm |
|---|------------------|-----------------|---------------------|
| | Mean ± SD/% (n) | Mean ± SD/% (n) | Mean ± SD/% (n) |
| Age (years) | 52.7 ± 11.1 | 52.9 ± 11.5 | 52.6 ± 10.7 |
| Gender (female) | 55.3% (244) | 52.2% (127) | 58.5% (117) |
| Married/long-term relationship | 53.1% (234) | 57.1% (124) | 49.1% (110) |
| Born in the United States | 25.6% (113) | 24.9% (54) | 26.3% (59) |
| Years in United States (if born outside US) | 18.2 ± 11.2 | 17.9 ± 11.9 | 18.5 ± 10.4 |
| Primary language | | | |
| English | 27.7% (122) | 26.7% (58) | 28.6% (64) |
| Spanish | 68.7% (303) | 69.5% (151) | 67.9% (152) |
| Other | 3.6% (16) | 3.7% (8) | 3.6% (8) |
| Race/ethnicity | | | |
| Asian | 4.1% (18) | 5.1% (11) | 3.1% (7) |
| African American | 19.0% (84) | 18.4% (40) | 19.6% (44) |
| Latino or Hispanic | 70.1% (309) | 71.0% (154) | 69.2% (155) |
| White | 2.5% (11) | 2.3% (5) | 2.7% (6) |
| Other | 4.3% (19) | 3.2% (7) | 5.4% (12) |
| Working status | | | |
| Employed full time | 18.6% (82) | 16.1% (35) | 21.0% (47) |
| Employed part time | 25.6% (113) | 26.3% (57) | 25.0% (56) |
| Unemployed/homemaker | 29.9% (132) | 33.2% (72) | 26.8% (60) |
| Retired/disabled/SSI/other | 25.9% (114) | 24.3% (53) | 27.2% (61) |
| Education | | | |
| Less than 5th grade | 22.7% (100) | 23.1% (50) | 22.3% (50) |
| 6th to 8th grade | 21.1% (93) | 20.7% (45) | 21.4% (48) |
| Some high school | 13.4% (59) | 12.4% (27) | 14.3% (32) |
| High school grad or GED | 17.7% (78) | 16.6% (36) | 18.8% (42) |
| Some college/college graduate | 25.1% (111) | 27.2% (59) | 23.3% (52) |
| Income | | | |
| Less than \$5000 | 34.0% (150) | 31.3% (68) | 36.6% (82) |
| \$5000-\$10,000 | 24.3% (107) | 25.3% (55) | 23.2% (52) |
| \$10,000-\$20,000 | 29.5% (130) | 29.0% (63) | 29.9% (67) |
| More than \$20,000 | 12.2% (54) | 14.2% (31) | 10.2% (23) |

GED indicates general education development test; SSI, Supplemental Security Income.

Health coaching had a significantly greater impact on patient-reported quality of care and satisfaction in Spanish-speaking patients. This is not surprising, as language often presents a barrier to receiving high-quality care, as evidenced by the lower baseline PACIC scores of Spanish-speaking patients; with our health coaches being bilingual, they were likely able to reduce this barrier. Although there was also a positive effect of health coaching for English-speaking patients, the magnitude was smaller and not significant.

Strengths and Limitations

One strength of the current study is the randomized controlled design, which avoided the potential biases due to the patient self-selecting to receive health coaching or usual care. The study included English- and Spanish-speaking low-income patients who received care through safety net clinics—a group for whom improvement in the quality of care is especially important. However it should be noted that the impact of health coaching might vary in a different population. A limitation was that coached pa-

Table 2. Change in PACIC Score and in Patient Satisfaction With Their Clinic (for 366 patients with 12-month questionnaire data)

| Outcome | Health Coaching (n = 200) | | | Usual Care (n = 166) | | | Difference in Change | Effect Size | P | P ^a |
|----------------------|---------------------------|-----------------------|--------|----------------------|-----------------------|--------|----------------------|-------------|-------|----------------|
| | Baseline Mean ± SD/% | 12 Months Mean ± SD/% | Change | Baseline Mean ± SD/% | 12 Months Mean ± SD/% | Change | | | | |
| PACIC score (total) | 3.00 ± 1.00 | 3.83 ± 0.88 | 0.83 | 3.06 ± 1.05 | 3.13 ± 1.01 | 0.07 | 0.75 | 0.77 | <.001 | <.001 |
| Activation | 2.49 ± 1.33 | 3.55 ± 1.24 | 1.06 | 2.67 ± 1.35 | 2.71 ± 1.31 | 0.04 | 1.02 | 0.78 | <.001 | <.001 |
| Practice design | 3.73 ± 1.13 | 4.37 ± 0.87 | 0.64 | 3.74 ± 1.06 | 3.70 ± 1.04 | -0.04 | 0.69 | 0.66 | <.001 | <.001 |
| Goal setting | 3.20 ± 1.22 | 3.98 ± 1.03 | 0.79 | 3.18 ± 1.21 | 3.25 ± 1.19 | 0.07 | 0.72 | 0.62 | <.001 | <.001 |
| Problem solving | 3.00 ± 1.33 | 3.86 ± 1.09 | 0.85 | 3.13 ± 1.31 | 3.21 ± 1.29 | 0.09 | 0.77 | 0.61 | <.001 | <.001 |
| Follow-up | 2.66 ± 1.15 | 3.45 ± 1.20 | 0.80 | 2.68 ± 1.22 | 2.83 ± 1.17 | 0.15 | 0.65 | 0.55 | <.001 | <.001 |
| Definitely recommend | 72.9% | 85.2% | 12.3% | 73.1% | 72.6% | -0.5% | 12.8% | NA | .001 | .002 |

PACIC indicates Patient Assessment of Chronic Illness Care.
^aAdjusted for differences in baseline values of outcome variable and for clustering by clinician.

tients were more likely have outcome information available compared with usual care patients (89% vs 76%). It is possible that a differential response by study arm could have introduced bias, though analyzing the data using imputed values for missing data did not change the results.

CONCLUSIONS

Our results support the view that patients perceive services received from medical assistant health coaches as part of their primary health. The magnitude of the improvement in chronic care for patients who received health coaching is greater than what has been reported from most other practice improvement studies, suggesting that this model of health coaching should play an important role in improving the quality of care for patients with chronic conditions, particularly for non-English-speaking patients.

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Author Affiliations: Department of Family and Community Medicine, University of California at San Francisco School of Medicine (DHT, DH, RW-G, DD, CP, TB, EHC), San Francisco, CA; Silver Avenue Family Health Center (EHC), San Francisco, CA.

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Address correspondence to: David Thom, MD, PhD, MPH, Department of Family and Community Medicine, University of California, San Francisco School of Medicine, 1001 Potrero Ave, Bldg 80/83, San Francisco, CA 94110. E-mail: dthom@fcm.ucsf.edu.

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