Lessons Learned From Implementing Health Coaching in The Heart Healthy Lenoir Hypertension Study

Katrina E. Donahue, Jim Tillman, Jacqueline R. Halladay, Crystal W. Cené, Alan Hinderliter, Doyle M. Cummings, Cassandra Miller, Ziya Gizlice, Beverly A. Garcia, Jia-Rong Wu, Emmanuelle Quenum, Hayden B. Bosworth, Thomas C. Keyserling, Darren DeWalt

Progress in Community Health Partnerships: Research, Education, and Action, Volume 10, Issue 4, Winter 2016, pp. 559-567 (Article)

Published by Johns Hopkins University Press
DOI: *https://doi.org/10.1353/cpr.2016.0064*

Lessons Learned From Implementing Health Coaching in The Heart Healthy Lenoir Hypertension Study

Katrina E. Donahue, MD, MPH[1,2], Jim Tillman, Dmin[3], Jacqueline R. Halladay, MD, MPH[1,2], Crystal W. Cené, MD, MPH[4], Alan Hinderliter, MD[4], Doyle M. Cummings, PharmD[5], Cassandra Miller, MPH[6], Ziya Gizlice, PhD[6], Beverly A. Garcia, MPH[6], Jia-Rong Wu, PhD[7], Emmanuelle Quenum, MPH[6], Hayden B. Bosworth, PhD[8,9], Thomas C. Keyserling, MD[4,6], Darren DeWalt, MD, MPH[2,4]

(1) Department of Family Medicine, UNC Chapel Hill; 2 Cecil G. Sheps Center for Health Services Research; (3) Clinical Practice Community members; (4) Department of Medicine, UNC Chapel Hill; (5) Department of Family Medicine, East Carolina University; (6) Center for Health Promotion and Disease Prevention, UNC Chapel Hill; (7) School of Nursing, UNC Chapel Hill; (8) Center for Health Services Research in Primary Care, Durham Veterans Affairs Medical Center; (9) General Internal Medicine, Duke University Medical Center

Submitted 05 October 2015, revised 29 February 2016, accepted 23 March 2016.

Abstract

Background: Health coaching is increasingly important in patient-centered medical homes.

Objectives: Describe formative evaluation results and lessons learned from implementing health coaching to improve hypertension self-management in rural primary care.

Methods: A hypertension collaborative was formed consisting of six primary care sites. Twelve monthly health coaching phone calls were attempted for 487 participants with hypertension.

Lessons Learned: Participant engagement was challenging; 58% remained engaged, missing fewer than three consecutive calls. Multivariate analyses revealed that older age (odds ratio [OR], 1.03; 95% confidence interval [CI], 1.01–1.05), African American race (O,R 1.73; 95% CI, 1.15–2.60), greater number of comorbidities (OR, 1.17; 95% CI, 1.05–1.30) and receiving coaching closer to enrollment (OR, 5.03; 95% CI, 2.53–9.99) were correlated independently with engagement. Participants reported the coaching valuable; 96% would recommend health coaching to others.

Conclusions: Health coaching in hypertension care can be successful strategy for engaging more vulnerable groups. A more tailored approach may improve engagement with counseling.

Keywords

Counseling, community-based participatory research, hypertension, implementation, primary health care, ambulatory care, vulnerable populations, quality of health care

Telephone health coaching between office visits is a useful adjunct to office-based care. In patients with chronic illness, telephone coaching improves health behaviors and health status.[1] Coaching can be especially helpful for vulnerable populations, including patients with multiple comorbidities, advanced age, and patients with low literacy by facilitating enhanced access to care.[1] Evolving primary care models, including a patient-centered medical home[2] and accountable care organizations,[3] provide opportunities for integrating health coaching in primary care. Additional groups, such as health insurance companies, target and provide models of health coaching for high risk participants, often engaging participants directly rather than through the clinical practice.[4]

The Heart Healthy Lenoir (HHL) hypertension study, part of a 5-year cardiovascular intervention in a county and surrounding stroke belt area in rural eastern North Carolina,

explored the feasibility of health coaching strongly grounded in motivational interviewing techniques with strategies to provide feedback to providers on participant home blood pressures (BPs) and goals.[5] In this paper, we evaluate a hypertension health coaching program in primary care settings in a rural, economically depressed area, describe lessons learned, using the RE-AIM (Reach, Effectiveness, Adoption, Implementation and Maintenance) framework[6] and identify correlates of participant engagement in the program.

METHODS

This study was part of the HHL Project, a collaborative research effort of three coordinated studies (genetics observational study, hypertension study, lifestyle study) designed to reduce cardiovascular disease risk and disparities in Lenoir county, North Carolina; further details of the methods previously published.[5] The HHL hypertension study used a community-based participatory research approach[7] in six primary care practices to design and test a multilevel intervention with both a practice and participant component with the overall goal of improving BP control rates and narrowing disparities in systolic BP control between African Americans and whites, and those with lower and higher health literacy. A subset of participants in the hypertension study (n = 226) were also enrolled in the lifestyle study in which participants in both studies received counseling on diet and physical activity.[8]

Intervention Planning

This paper focuses on the phone coaching program component of the HHL hypertension study, which was developed for uncontrolled hypertensive participants and modeled after a successful evidence-based telephone care management program.[9] The outcomes of the HHL hypertension program will be separately submitted in a future publication. Our team worked closely with this program,[9] which provided assistance in developing HHL phone coaching software, as well as coach training. To make the program more feasible and cost effective, the HHL team employed trained health coaches instead of nurses to implement calls. Practices also participated in quarterly learning collaboratives and monthly design team calls, which further shaped the intervention by allowing practice staff the opportunity to share experiences in working with study intervention strategies.

Approach to Partnership

The HHL Project used a community-based participatory research framework[7] to guide development of all three studies, including a collaboration among UNC Chapel Hill, East Carolina University, and a coalition of community partners. The overall goal was to create a sustainable approach to reducing cardiovascular disease risk and disparities in this rural county. A community advisory board representing public health, medical, business, policy, and faith-based organizations met quarterly with the research teams to make sure plans were sensitive to the community culture. For the hypertension study, there was an additional layer of practice stakeholder engagement; monthly calls with lead practice providers and staff designed the hypertension practice intervention at the formative phase,[10] provided feedback throughout the study and participated in dissemination as evidenced by coauthorship on publications.[8,10,11]

Participants

HHL study participants' eligibility criteria included age 18 year or older, hypertension diagnosis with systolic BP of 150 mm Hg or greater on at least one clinic visit, established patient at a participating primary care practice, English speaking, and approval for participation by their primary care provider. Potentially eligible participants were mailed a letter signed by their primary care practice lead providers and received an audiotaped call from a practice staff member.

Coaching Curriculum

Participants received monthly coaching calls over 1 year. The participants were placed into one of five coaching groups based on their systolic BP measured at enrollment. Participants with the highest BP readings and earliest enrollment dates were called sooner by the coach.

The coaches used scripted healthy lifestyle and hypertension management information, motivational interviewing techniques, and goal setting strategies to promote behavioral change. Coaches used software that followed a standard curriculum for each of the phone encounters. Curriculum topics covered stress management, alcohol and tobacco use, healthy eating, physical activity, patient–provider interaction, medication adherence, and weight loss (further details in Halladay et al[5]). All participants were mailed a letter reminding them of

their upcoming coaching call, along with educational materials that would be discussed during the call.

Participants also received a BP monitor (Omron Model BP 785 or Omron BP 653 wrist monitor) and were asked to record BP three times weekly. During calls, the coach reviewed the participant's recent home pressure readings and assessed adherence ("Are you taking your medicine as prescribed?"). The coach problem solved with the participant if their BP readings were higher, or if they reported medication adherence issues. The coach then followed the curriculum for that encounter. At the first call, the participant chose a long-term goal that was reviewed with the coach regularly. This goal could be related to their BP or other issues affecting their health. The participants also had an opportunity to set short-term goals to work on between coaching sessions. After each phone coaching session, a short session summary was faxed to the primary care provider. Providers were encouraged to contact the coach if they had any questions or if they wanted the coach to follow-up with the participant on specific problems.

Coach Training

Two coaches delivered the intervention. The lead coach was a certified integrative health coach, which included intensive training in motivational interviewing.[12] The lead coach received a 4-hour training from the telephone management program[9] and participated in follow-up calls to discuss challenges in implementation. The lead health coach trained the second coach and both met with the project director and manager monthly to discuss any issues or questions.

Fidelity

To ensure consistency in the quality of the phone coaching intervention between the two coaches, a minimum of four calls per group were recorded over the 12 months per coach. A research team member listened to the audiotapes and used a standard evaluation tool created by the team. This tool included the degree to which scheduled topics were discussed or missed, counselor effectiveness in setting discreet steps, use of reflective listening, use of open-ended questions, and promotion of participant self-efficacy.

Evaluation Framework

The coaching program was evaluated using the RE-AIM framework (Table 1).[6] Program reach was determined by the number of eligible participants who were reached by the coach. Effectiveness focused on implementation effectiveness and included the percent of participants who set a goal. Adoption was defined by the degree health coaching was integrated into the provider visit. Implementation was quantified as the percent of participants that received a coaching call and fidelity to

Table 1. RE-AIM Evaluation Framework*

Dimension	Definition	Metrics Assessed in This Study
Reach	The absolute number, proportion, and representativeness of individuals who are willing to participate in a given intervention.	Number of eligible participants who were reached by the coach for a coaching call.
Effectiveness	The impact of an intervention on important outcomes, including potential negative effects, quality of life, and economic outcomes.	Percent of participants who set a goal.
Adoption	The absolute number, proportion and representativeness of settings and intervention agents who are willing to initiate a program.	Degree to which health coaching was integrated into the provider visit.
Implementation	At the setting level, implementation refers to the intervention agents' fidelity to the various elements of an intervention's protocol, including consistency of delivery as intended and the time and cost of the intervention. At the individual level, implementation refers to participants' use of the intervention strategies.	Frequency with which participants received a coaching call. Fidelity to the protocol.
Maintenance	At the setting level, the extent to which a program or policy becomes institutionalized or part of the routine organizational practices and policies. At the individual level, as the long-term effects of a program on outcomes after 6 or more months after the most recent intervention contact.	Percent of who remained engaged in phone coaching. Whether the coaching program was incorporated into the clinic post intervention.

Abbreviation: RE-AIM, Reach, Effectiveness, Adoption, Implementation and Maintenance.

* Available from: http://www.re-aim.org

the protocol. Maintenance included the percent who remained engaged in phone coaching (defined as missing fewer than three consecutive monthly calls), and whether the coaching program was incorporated into the clinic after the intervention.

Measures

Participant measures, including demographics and instruments listed below were collected via paper survey during the enrollment visit. Health literacy was measured using the Short Test of Functional Health Literacy in Adults (low literacy defined as score of 0 to 22).[13] Participant activation was measured with the Patient Activation Measure (level 1 [lowest activation] to level 4 [highest activation]).[14] Medication adherence was measured with the eight-item Morisky Medication Adherence score (low adherence score is < 6).[15] Coaching phone duration was recorded after each call by the coach, who wrote down start and end times and entered total minutes into a database. BP was obtained via OMRON HEM–907XL automated BP monitor using JNC–7 BP measurement protocol.[5] At the end of the intervention, participants were asked via paper survey about their perspectives and satisfaction with phone coaching.

Analyses

The study sample characteristics were summarized using descriptive statistics. Participant engagement in coaching was analyzed as engaged (missing fewer than three consecutive monthly calls), compared with less engaged (missing three or more consecutive monthly calls) or not engaged (those who did not participate). Demographic and medical correlates of engagement (e.g., missing less than three consecutive calls) were analyzed using chi-square (for categorical variables) and *t* tests (continuous variables). Variables associated with participant engagement at significance of 0.1 level in bivariate comparisons (age, race, employment status, low medication adherence, low literacy, taking more than three medications, systolic BP, and number of comorbid conditions) were subsequently used as covariates in stepwise logistic regression models along with sex and education level (always included as control variables in the models) to characterize their independent relationships with successful engagement. The initial model included all covariates and control variables. Subsequent models excluded low medication adherence, taking more than three medications, low literacy, employment status, and systolic BP using a manual backward selection approach in which a single variable at a time was eliminated, if it was not significant at the $p = 0.2$ level. BP outcomes will be addressed in a future paper.

The UNC School Biomedical Institutional Review Board reviewed and approved this study.

RESULTS

The HHL Hypertension Study consisted of 525 participants, 38 of whom withdrew (death, medical reasons, moved, personal reasons, lost to follow-up) before coaching began. Coaches attempted to contact the remaining 487 participants (Figure 1); 122 (25%) were never reached. The mean participant age was 60 years; 67% were female, 61% African-

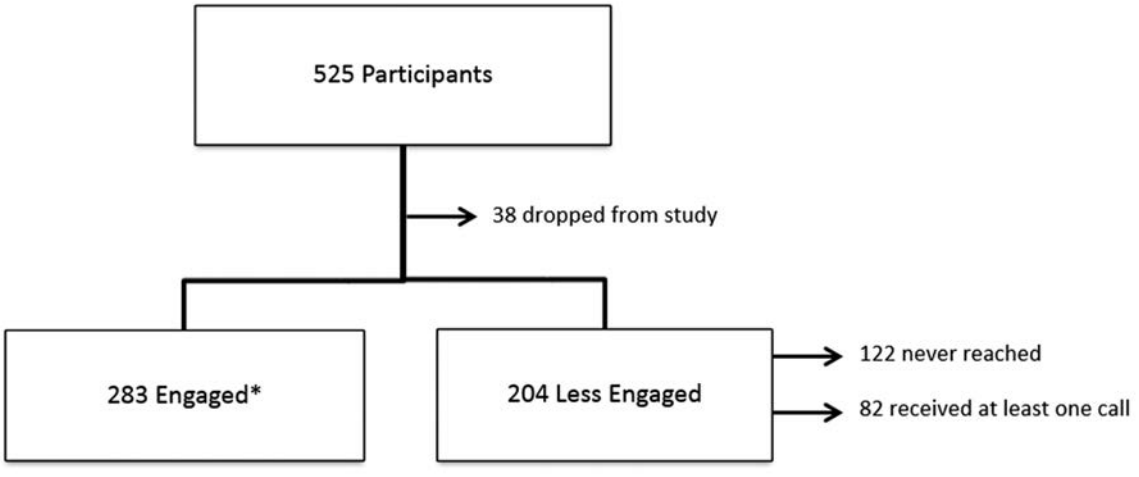

Figure 1. Reach of coaching.

* Engaged = missing <3 consecutive calls.

Table 2. Participant Demographics ($N = 487$)	
Characteristic	**%***
Mean age, yrs (*SD*)	57.9 (12.4)
Gender	
Male	32.9
Female	67.1
Race	
African American	61.0
White	39.0
Mean BMI (*SD*)	36 (9.5)
Education	
Less than high school	26.5
High school	45.9
More than high school	27.6
Employment	
Working full time	30.6
Other	69.4
Participation Lifestyle study	38.2
Literacy (S-TOFHLA)†	
Low†	25.4
High†	74.6
Number of prescription medications	
0–3	35.9
≥4	64.1
Blood pressure, mean ± *SD*	
Systolic	139.1 (22.0)
Diastolic	81.9 (13.0)
Uncontrolled blood pressure (systolic blood pressure ≥ 140)	44.4
Mean comorbidities (*SD*)	3.5 (1.9)
Morisky adherence	
Low	39.4
Moderate	60.4
High	0.2
Patient activation scores (level)	
1 (lowest activation)	11.9
2	19.9
3	32.9
4 (highest activation)	35.3

Abbreviation: SD, standard deviation.

* Percent unless otherwise noted.

† Short Test of Functional Health Literacy in Adults (S-TOFHLA; low literacy if score = 0–22; higher literacy if score = 23–36).

American, and 25% had low health literacy (Table 2). The mean number of comorbidities was 3.5, and 39% reported low medication adherence at baseline.

Reach

The average number of attempted calls per participant encounter was 2.3, and the average call length was 13 minutes (range, 4–33; Table 3). Forty-six percent of participants, on average, were successfully contacted per month. There was a delay between study enrollment and receiving first phone coaching (median 12 months) due to time needed for hiring and training coaches, developing the database, and developing curriculum. However, this delay was shortened for those with the highest risk profile (median, 7 months).

Effectiveness

Participants could set multiple goals, with an average of seven goals over 12 months (range, 0–21). The most commonly set goals were related to diet and physical activity (Table 3). Of the 365 participants reached by the phone coach, 96% set at least one goal. Eighty-four percent of participants who set a goal self-reported reaching at least one goal.

Table 3. Phone Coaching ($N = 487$)	
Mean number attempted calls* to reach participant	2.3
Number of completed calls	
12	130
9–11	91
6–8	54
3–5	44
< 3	168
Percent of participants reached per month (mean)	46.5
Engaged in phone coaching†	58.1%
Average call length, min (range)	13.0 (4–33)
Most common goals participants chose to address (% of participants who set goal)	
A. Diet	58.7
B. Exercise	53.8
C. Other	20.3
D. General weight loss (no specific behavioral goal)	19.7
E. Blood pressure	15.8

* Maximum calls attempted to reach participant per month was four.

† Engaged defined as participant missing fewer than three consecutive calls.

Adoption

Throughout the intervention, providers were encouraged to communicate with the phone coaches if they had any questions or wanted the coaches to follow-up on any topics they discussed with the participant in clinic. Anecdotally, providers noted at monthly design team calls that they reviewed the health coach's notes before the participant visit. The coaches did not receive any inquiries from providers, except for one call to clarify participant demographics. Although the providers did not communicate often with the coaches, they did express interest in continuing the phone coaching program with their participants, if resources were available. They were also interested in incorporating motivational interviewing techniques into office visits that could be provided by existing office staff.

Implementation

The greatest implementation limitation was the ability to reach participants. More than one-half of participants (53%) due for a monthly phone call could not be reached. The coach scheduled the following month's call at the end of each encounter to increase the likelihood of reaching the participant. Modifications such as calling the participant at a friend or neighbor's house were made for participants who did not have regular access to a phone. During weekly research team meetings, the coaches noted that 12 months of coaching felt long and that many participants had met their self-determined goals or were weary of the program after 6 months.

With regard to monitoring fidelity, 50 calls were recorded and reviewed by a research team member. The team provided feedback to the coach up to one month after each recorded call. Examples of feedback included: concern that the goal set by the participant was too ambitious and suggestion of additional questions the coach could have asked.

Maintenance

Fifty-eight percent of participants remained engaged with phone coaching over the 12-month period (missed fewer than three consecutive monthly calls). Seventeen percent were less engaged (received at least one call), and 25% were not engaged in phone coaching.

Although practices did not have resources to invest in

Table 4. Comparison Between Participants Engaged* and Less Engaged in the Coaching Program

Characteristic	Engaged ($n = 283$)	Less or Not Engaged ($n = 204$)	p Value
Mean age (yrs)	60.0	55.0	<0.001
Female (%)	69.3	64.2	0.242
African American (%)	64.5	56.2	0.066
Education (%)			0.143
Less than high school	29.3	22.7	
High school	42.4	50.7	
More than high school	28.3	26.6	
Working full time (%)	27.9	34.3	0.130
Participated in lifestyle study (%)	39.6	36.3	0.459
Low literacy (%)	29.1	20.2	0.027
Low patient activation (level 1) (%)	12.7	10.8	0.273
Low medication adherence (%)†	36.2	43.9	0.107
Uncontrolled BP (%)‡	51.2	34.8	<0.001
More than 3 medications (%)	68.6	57.8	0.015
Mean comorbidities (n)	3.7	3.2	0.003
Earlier phone coaching (%)§	23.0	5.9	<0.001

* Engagement defined as participant missing fewer than consecutive calls.

† Low medication adherence defined as less than 6 points on the Morisky Adherence scale.

‡ Uncontrolled BP defined as systolic BP ≥ 140 mm Hg.

§ Started first coaching session within 9 months of enrollment.

coaching, the participating practice staff considered the coaching program valuable and requested training in brief motivational interviewing techniques. During three of the quarterly collaborative meetings, one of the coaches provided an overview of the elements of motivational interviewing with subsequent small group role play/case–based training.

Correlates of Engagement

Engaged coaching participants tended to be older (60 years vs 55 years; $p < 0.001$), and have lower health literacy (29.1% vs 20.2%; $p = 0.027$) than less engaged participants. A higher number of engaged participants had uncontrolled BP (systolic BP ≥ 140 mm Hg: 51.2% vs 34.8%; $p < 0.001$), took more than three medications (68.6% vs 57.8; $p = 0.015$), had more comorbidities (3.7 vs 3.2; $p = 0.003$), and began coaching closer to enrollment (23% vs 5.9%; $p < 0.001$) than less engaged participants (Table 4). There were no associations with engagement and employment status or participation in the lifestyle study. Multivariate logistic regression analysis revealed that older age (OR, 1.03; 95% CI, 1.01–1.05), African American race (OR, 1.73; 95% CI, 1.15–2.60), greater number of comorbidities (OR, 1.17; 95% CI, 1.05–1.30), and coaching closer to enrollment (OR, 5.03; 95% CI, 2.53–9.99) were independently correlated with engagement (Table 5).

Participant Satisfaction

Participant feedback at study end was highly positive ($n = 356$). Of the engaged participants, 95% felt the information they received was just the right amount and 96% would recommend phone coaching to others. However, 16% of engaged and 35.2% of less engaged expressed barriers to participating in the phone coaching intervention, including not having enough time (33% engaged, 29% less engaged), not having regular access to a phone (2% engaged, 6% less engaged), not enough cell phone minutes (9% engaged, 13% less engaged), did not feel they needed calls (5%, engaged, 3% less engaged), and too many other life issues at the time (37% engaged, 52% less engaged).

DISCUSSION

Overarching lessons learned from the HHL phone coaching program included: (1) difficulty sustaining participant engagement for 12 months, (2) some success with reaching vulnerable at risk participants, and (3) difficulty with bidirectional communication between the health coach and provider.

1. Engagement for the duration of the HHL program was only moderate, with 58% of participants remaining involved for the full 12 months. These data are similar to those described in prior phone coaching interventions.[16] Reaching participants on the phone was a significant barrier to the implementation of the HHL program, which limits effectiveness. Programs that are more embedded into health care, such as an integrated health care system, may demonstrate better engagement.[17] One potential option includes providing participants with phones or phone minutes to improve the ability to reach them.
2. Our data that show older participants, African Americans, and those with a greater number of comorbidities were more engaged with the program, which indicates that the HHL program may be a better approach for more "vulnerable" participants. These findings are similar to prior phone-based interventions showing improved effects in African Americans.[9,18] This suggests the potential to use this strategy in a tailored fashion based on a risk stratification process at the practice or community level.
3. Although providers were active in developing the intervention through monthly design team calls, minimal communication occurred directly with coach. Confirmation of receiving information and comments regarding participants' self-management goals or concerns would have helped to close the communication loop with the coach. Other potentially successful approaches include an enhanced interprofessional collaborative approach where medical assistants, already integrated in the practice, could provide health coaching during the time of the visit.[19]

Table 5. Logistic Regression of Factors Associated with Engagement* in the Coaching Program

Characteristic	Odds Ratio (95% Confidence Interval)	*p* Value
Mean age	1.03 (1.01–1.05)	< 0.001
Female gender	1.22 (0.807–1.850)	0.344
Black race	1.86 (1.22–2.81)	0.004
Education	1.08 (0.99–1.17)	0.057
Number of comorbidities	1.17 (1.05–1.30)	0.004
Earlier phone coaching	5.03 (2.53–9.99)	< 0.001

* Engagement defined as participant missing fewer than three consecutive calls.

However, the concept of a patient-centered medical home and teams was relatively new to this rural underserved area; some providers, staff, and patients voiced discomfort with a team-based approach during the early formative work of the HHL program.[10] Increasing the opportunity for face-to-face interaction between the coach and providers or embedding the coaches in practices may have allowed for greater bidirectional communication between coaches and providers and may have facilitated sustainability. Most successful programs tend to institutionalize quality improvement interventions rather than treat them as projects.[20]

The limitations of this study include coaching types; although the coaches were from the same region, having a peer conduct coaching calls may have greater impact on participants, because peer support models have proven efficacy.[21–24] Of note, more than one-half of the less engaged participants reported "other life priorities." Although the beneficial effects of a program can be seen in disenfranchised individuals up to a point, in a study of participants post myocardial infarction, an increase in perceived life chaos was associated with decreased medication adherence.[25] In addition, the electronic health record could have been better integrated into the program as a communication tool. Allowing the provider to share clinic notes recorded in the electronic health record (e.g., BP was high at clinic, the participant is struggling with maintaining physical activity levels) with the coach to the might have enhanced or improved communication between the coach and provider. Finally, only 44.6% of participants had uncontrolled BPs. It is common for BPs to decrease between recruitment and enrollment. Prior hypertension studies have shown similar findings.[26–28]

In conclusion, health coaching can be implemented successfully in rural communities to facilitate optimal hypertension care, and may be particularly useful in reaching vulnerable population groups. However, to optimize program success, a more tailored approach may be necessary. Potential modifications include a shortened coaching intervention, identifying participants in most need of coaching, and housing the coach within the practice to enhance communication. Adaptations such as these are important to success and intervention sustainability.

ACKNOWLEDGMENTS

Funding provided by National Heart Lung and Blood Institute, NHLBI 1P50HL10584–01. The funding body had no role in the collection, analysis, and interpretation of study data, nor did they play a role in the writing of the manuscript or the submission of the manuscript for publication. Trial registration: ClinicalTrials.gov NCT01425515. Thanks to Jennifer Greyber for her thoughtful review and editing of the manuscript.

REFERENCES

1. Dennis SM, Harris M, Lloyd J, et al. Do people with existing chronic conditions benefit from telephone coaching? A rapid review. Aust Health Rev 2013;37(3):381–8.
2. Rosenthal TC. The medical home: Growing evidence to support a new approach to primary care. J Am Board Fam Med 2008;21(5):427–40.
3. Luft HS. From small area variations to accountable care organizations: how health services research can inform policy. Annu Rev Public Health 2012;33:377–92.
4. Wennberg DE, Marr A, Lang L, et al. A randomized trial of a telephone care-management strategy. N Engl J Med 2010;363(13):1245–55.
5. Halladay JR, Donahue KE, Hinderliter AL, et al. The Heart Healthy Lenoir project—An intervention to reduce disparities in hypertension control: Study protocol. BMC Health Serv Res 2013;13:441.
6. Hulsman RL. Shifting goals in medical communication. Determinants of goal detection and response formation. Patient Educ Counsel 2009;74(3):302–8.
7. Viswanathan M, Ammerman A, Eng E, et al. Community-based participatory research: assessing the evidence. Evid Rep Technol Assess (Summ) 2004;99:1–8.
8. Pitts SB, Vu MB, Garcia BA, et al. A community assessment to inform a multilevel intervention to reduce cardiovascular disease risk and risk disparities in a rural community. Fam Community Health 2013;36(2):135–46.
9. Jackson GL, Oddone EZ, Olsen MK, et al. Racial differences in the effect of a telephone-delivered hypertension disease management program. J Gen Intern Med 2012;27(12):1682–9.
10. Donahue KE, Vu MB, Halladay JR, et al. Patient and practice perspectives on strategies for controlling blood pressure, North Carolina, 2010–2012. Prev Chronic Dis 2014;11:E69; quiz E69.
11. Kowitt S, Woods-Jaeger BA, Lomas J, et al. Cardiovascular health among African American adults and youth: Using photovoice to understand conceptualization, barriers, and facilitators. Prev Chronic Dis 2015;12:E164.
12. Miller WR, Rollnick S. Motivational interviewing: Preparing people to change addictive behavior. New York: Guilford Press; 1991.
13. Baker DW, Williams MV, Parker RM, et al. Development of a brief test to measure functional health literacy. Patient Educ Couns 1999;38(1):33–42.
14. Hibbard JH, Stockard J, Mahoney ER, et al. Development of the Patient Activation Measure (PAM): Conceptualizing and measuring activation in patients and consumers. Health Serv Res. 2004;39(4 Pt 1):1005–26.
15. Morisky DE, Green LW, Levine DM. Concurrent and predictive validity of a self-reported measure of medication adherence. Med Care 1986;24(1):67–74.
16. Crowley MJ, Powers BJ, Olsen MK, et al. The Cholesterol, Hypertension, And Glucose Education (CHANGE) study: Results from a randomized controlled trial in African Americans with diabetes. Am Heart J 2013;166(1):179–86.
17. Zullig LL, Bosworth HB. Behavioral interventions to improve hypertension control in the Veterans Affairs healthcare system. J Clin Hypertens (Greenwich) 2014;16(11):827–37.
18. Sperber NR, Bosworth HB, Coffman CJ, et al. Differences in osteoarthritis self-management support intervention outcomes according to race and health literacy. Health Educ Res 2013;28(3):502–11.
19. Thom DH, Willard-Grace R, Hessler D, et al. The impact of health coaching on medication adherence in patients with poorly controlled diabetes, hypertension, and/or hyperlipidemia: a randomized controlled trial. J Am Board Fam Med 2015;28(1):38–45.
20. Bray P, Cummings DM, Wolf M, et al. After the collaborative is over: what sustains quality improvement initiatives in primary care practices? Jt Comm J Qual Patient Saf 2009;35(10):502–8.
21. de Vries L, van der Heijden AA, van 't Riet E, et al. Peer support to decrease diabetes-related distress in patients with type 2 diabetes mellitus: Design of a randomised controlled trial. BMC Endocr Disord 2014;14:21.
22. Chan JC, Sui Y, Oldenburg B, et al. Effects of telephone-based peer support in patients with type 2 diabetes mellitus receiving integrated care: A randomized clinical trial. JAMA Intern Med 2014;174(6):972–81.
23. Fisher EB, Coufal MM, Parada H, et al. Peer support in health care and prevention: cultural, organizational, and dissemination issues. Annu Rev Public Health 2014;35:363–83.
24. Kulik NL, Fisher EB, Ward DS, et al. Peer support enhanced social support in adolescent females during weight loss. Am J Health Behav 2014;38(5):789–800.
25. Zullig LL, Shaw RJ, Crowley MJ, et al. Association between perceived life chaos and medication adherence in a postmyocardial infarction population. Circ Cardiovasc Qual Outcomes 2013;6(6):619–25.
26. Bosworth HB, Olsen MK, Goldstein MK, et al. The veterans' study to improve the control of hypertension (V-STITCH): design and methodology. Contemp Clin Trials 2005;26(2):155–68.
27. Bosworth HB, Olsen MK, Neary A, et al. Take Control of Your Blood Pressure (TCYB) study: A multifactorial tailored behavioral and educational intervention for achieving blood pressure control. Patient Educ Couns 2008;70(3):338–47.
28. Reed *SD*, Li Y, Oddone EZ, et al. Economic evaluation of home blood pressure monitoring with or without telephonic behavioral self-management in patients with hypertension. Am J Hypertens 2010;23(2):142–8.