

The effect of a faith community nurse network and public health collaboration on hypertension prevention and control

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Abstract

Background: As part of the Association of State and Territorial Health Official's Million Hearts State Learning Collaborative in 2014 and 2015, Washington County, Maryland formed a collaboration between the local health department, health system and faith community nurse network to address the undiagnosed and uncontrolled hypertension in the county.

Objectives: Data were analyzed to determine the effect of a faith community nursing intervention of teaching blood pressure self-monitoring and coaching blood pressure and lifestyle changes in the at-risk and hypertensive population.

Methods: Thirty-nine faith community nurses offered a 3-month blood pressure self-monitoring and coaching intervention in 2014 and 2015 to 119 participants. A secondary data analysis using a repeated measure ANOVA to assess the differences in pre- and post-intervention systolic and diastolic blood pressure readings and a paired *t*-test to compare pre- and post-lifestyle scores was completed.

Results: A total of 109 participants completed the program and were included in the analysis and were showing decreased blood pressure readings and improved lifestyle satisfaction scores in six out of seven areas across the program period.

Conclusion: Coaching by faith community nurses creates an environment of sustained support that can promote improved lifestyles and blood pressure changes over time.

KEYWORDS

blood pressure, community/public health nurse, faith community nurse, hypertension, Million Hearts, Parish nurse, prevention

1 | BACKGROUND

The Million Hearts initiative, led by the Centers for Disease Control & Prevention (CDC) and Centers for Medicare & Medicaid Services (CMS), was aimed at preventing one million heart attacks and strokes by 2017. Maryland was one of 10 state teams within the year-one Million Hearts State Learning Collaborative that was launched in October 2013 by the Association of State and Territorial Health Officials (ASTHO). The collaborative has supported 22 state health departments working to integrate public health and health care to address hypertension (Association of State and Territorial Health

Officials, 2017). The Maryland Department of Health & Mental Hygiene identified Washington County, Maryland to offer a Million Hearts program that would help to achieve local and state goals of prevention and control of hypertension. A collaboration between the county health department, health system, and faith community nurse network was formed to reach those in the community who were at-risk for or living with hypertension.

As an affiliate of ASTHO, the Association of Public Health Nurses (APHN) served as a national partner in the State Learning Collaborative to identify and support community/public health nurses who were involved in the identification and management of

those with hypertension. The Million Hearts's focus on prevention and community-clinical collaboration was a call to action for nurses in the community to partner with primary and acute care partners, better coordinate and share data, and implement innovative ways to identify undiagnosed and uncontrolled hypertension and coach self-management.

Blood pressure control is one of the measures of the national Million Hearts's initiative. Hypertension can be prevented and managed through lifestyle interventions, such as promoting healthy diets and increased activity (Institute of Medicine of the National Academies (2010). Further, one individual factor related to uncontrolled hypertension is lack of social support (Institute of Medicine of the National Academies, 2010). Therefore, those at risk or living with hypertension and other chronic conditions can be best identified and can receive ongoing support by trusted health professionals who are able to screen, monitor, and coach them outside of a health care setting. While the model of nurses working with community members to address risk factors related to chronic disease is not new, it remains under-utilized and under-funded.

This paper serves as "part two" of a previous publication evaluating the year one program plan and implementation of a faith community nurse-led Million Hearts program in Washington County, Maryland (Authors, 2016). The purpose of the project was to determine the effect of a faith community nursing intervention of blood pressure monitoring and coaching on blood pressure and lifestyle changes in the at-risk and hypertensive population. The aim of the project was to perform a secondary data analysis of blood pressure readings and lifestyle satisfaction scores. Data were collected by the faith community nurses (FCN) who offered blood pressure monitoring and coaching on lifestyles changes to prevent or control the hypertension. The data analysis plan was centered on two research questions as follows:

1. Was there a difference in systolic and diastolic blood pressures of participants before, during, and after the faith community nurse blood pressure monitoring and coaching intervention?
2. Was there a difference in participant's satisfaction with lifestyle changes comparing pre- and post-faith community nurse monitoring and coaching intervention?

While this is one of many Million Hearts projects aimed at improving blood pressure and lifestyles, it serves as an exemplar of how a faith community nursing, network, public health, and health system partnership and interventions can contribute to meeting macro-level goals within a state and national initiative. Dissemination of these outcomes can support project replication in other community settings, increase the visibility nursing interventions in the community, and stimulate further funding opportunities for these efforts.

1.1 | Literature review

At the start of the national Million Hearts Initiative, 67 million Americans had hypertension. Of those 67 million, over half were either not controlled or unaware that they had hypertension (Centers

for Medicare & Medicaid Services, 2012). To move from the baseline of 46% of the population with controlled blood pressure in 2010 to the target of 65% by 2017, the initiative aims to identify the undiagnosed, control the treated, coach self-management, drive measurement and reporting, and reduce sodium intake of the population (Centers for Medicare & Medicaid Services, 2012). These initial findings support the need to reach into local communities to implement practices and systems change to address the risk factors and identify and treat the undiagnosed. This Million Hearts project demonstrates a partnership between a local health system, public health, and a faith community nurse network that has proven to provide a greater continuum of care for those in the community at risk for or managing hypertension.

There is evidence that the Faith Community Nurses (FCNs) can be key partners in the promotion of health. Faith community nursing is a specialty practice of professional nursing that focuses on intentional care of the spirit, as part of the process of promoting holistic health and preventing or minimizing illness, within the context of a faith community (American Nurses Association & Health Ministries Association, 2012). With an intentional focus on spiritual health, the FCN primarily uses education, counseling, prayer, presence, active listening, advocacy, referral, and a wide variety of resources available to the faith community (American Nurses Association & Health Ministries Association, 2012).

The parishioner-faith community nurse relationship is often an established and trusted relationship that is fostered in a nonthreatening setting, the faith community. Nurses are well positioned to partner with health systems and public health agencies, in the prevention and ongoing management of chronic conditions. Faith community nurses can independently identify or receive referrals from health care providers in acute or primary care settings or public health clinics. They can provide follow-up, monitoring, and health coaching. They assess social determinants of health that often go unnoticed in the health care setting. For example, nurse practitioners, in health care settings, cannot always get a full picture of social determinants of health that impact health outcomes (Davis & Chapa, 2015). Partnering with FCNs, who are practicing in an existing environment, provides an extra layer of assessment, support, and intervention. Faith community nurses promote preventive and social services, help to coordinate services, and support patient adherence to treatment regimens, within the supportive environment of the faith community (Schroepfer, 2016).

While literature specifically describing the role of community/public health nurses offering interventions aimed at preventing and improving blood pressure and related lifestyles is limited, there is evidence that monitoring and coaching by nurses in the community can improve lifestyles and lower blood pressure. A 15-month, quasi-experimental study in Sweden of 100 participants resulted in a decline in diastolic blood pressure in 52% of patients and a decline in systolic blood pressure from 141.9 mmHg to 137.5 mmHg that was statistically significant following monitoring and coaching by a community health nurse (Drevenhorn, Kjellgren, & Bengtson, 2007). A 6-month, randomized-controlled trial of 120 participants resulted in a greater decrease in systolic and diastolic blood pressure in the intervention group (those coached by a public health nurse) compared with the control group (Ma, Zhou, Zhou, & Huang, 2014). The community

nurses' ability to counsel individuals in the communities allowed for a greater understanding of individual beliefs and behaviors and provided an opportunity for nurses to address misconceptions and concerns (Drevenhorn et al., 2007).

An interview of 34 faith and health leaders noted that faith-based organizations successfully promote health because community members rely on them for information and guidance, have strong reputations, and serve as the "center of life" for many people (Kegler, Hall, & Kiser, 2010). In a review of 53 faith-based health programs from 1990 to 2000 with a variety of health focus areas in 30 different locations, it was recommended that increasing the evaluation and dissemination of faith-based programs will provide a better understanding of how these projects contribute to systematically improving the health of populations (DeHaven, Hunter, Wilder, Walton, & Berry, 2004). Faith community and public health collaboration is not new, in fact, faith communities have been a long-term ally of public health (Levin, 2014). The literature shows a history of faith community and public health initiatives that have been able to effectively reach at-risk populations because of the trust factor and holistic view of health (Association of State and Territorial Health Officials, 2014).

2 | METHODS

2.1 | Design

The project used a one group pre-post design to measure blood pressure and lifestyle satisfaction scores. Project data were used in a secondary data analysis to measure the effect of blood pressure monitoring and lifestyle coaching by the FCN on participant blood pressure readings and lifestyle changes.

2.2 | Sampling and recruitment

The project used a convenience sample of faith community members or those associated with a faith community with or at-risk for hypertension. Faith community nurses identified 119 participants (58 participants in the 2014 cohort and 61 participants in the 2015 cohort) who were either known to be hypertensive (i.e., blood pressure $\geq 120/80$), at higher risk based on known risk factors of obesity, poor diet, smoking and the presence of other chronic conditions, and/or self-identified for participation. In the 2014 cohort, 21 participants were male and 37 participants were female. In the 2015 cohort, 16 participants were male and 45 were female. Other detailed demographic information was not available because of the practice setting and the project design. A power analysis was completed based on the sample size and presystolic and prediastolic blood pressure measures.

Because the time frame for recruitment of participants within the ASTHO State Learning Collaborative was so short and a limited number of blood pressure monitors were allocated, participants were invited to participate solely based on their history of hypertension, risk factors related to hypertension, relationship with their faith community nurse, and willingness to complete the three-month project.

No additional participants joined once the three-month project had begun. The 2014 cohort was not prescreened as to their use of anti-hypertensive medications, however, 64% of the participants ($N = 39$) in the 2015 cohort were known to be taking anti-hypertensive medications at the onset of the project.

2.3 | Setting

The intervention was offered in faith communities, but could be replicated in a variety of settings, including health departments, community centers, home care, primary care clinics, and senior centers.

2.4 | Intervention

The part-time Parish Nurse Coordinator supports a regional network of over 100 unpaid, professional FCNs practicing in 52 congregations of approximately 27,000 total parishioners. Their intervention identified 39 FCNs interested in participating in the three-month project. They were educated on hypertension prevention and control, accurate blood pressure measurement, teaching self-monitoring, and use of heart-healthy education materials to prepare them to monitor participant blood pressure and coach participants on lifestyle changes. The FCNs attended a two-hour training and successfully completed a blood pressure competency demonstration (Williams, Brown, & Conlin, 2009). Following the training, the FCNs identified a total of 119 participants who are hypertensive or at-risk for hypertension. The project required FCNs to have a minimum of three face-to-face meetings with each participant in the three-month project period to monitor blood pressure and provide coaching on making lifestyle changes. Faith Community Nurses also referred participants to primary care providers, if high readings or medication concerns were noted.

2.5 | Measurement and data collection procedures

Participating FCNs collected and recorded a single baseline blood pressure measure for each participant using a new digital home monitor provided to each participant. Faith Community Nurses taught each participant to use the monitor and record self-monitored blood pressure readings daily for two weeks. A blank recording log was created in Microsoft Word and distributed to each participant by the FCN. Participants also self-rated lifestyle areas from the *Model for Healthy Blood Pressure* rating tool that uses a rating scale from one to ten, with one being a rating where the participant was unsatisfied and ten being a rating where the participant was completely satisfied. These lifestyle areas (blood pressure self-monitoring, healthy activity, healthy weight, managing medications, healthy eating, tobacco use, and stress management) were self-rated on the *Model for Healthy Blood Pressure* tool, based on the American Heart Association's *Simple Seven* (American Heart Association, 2015) and adapted, with permission, from The Church Health Center (2010). This tool was validated by the Church Health Center as part of their *Wellness 4 Life* program offered in their community clinic. Using these scores, FCNs worked with participants

to create an individualized action plan to address one or two lifestyle areas to improve. Participants re-rated the lifestyle areas at the final meeting.

The FCNs collected pre- and post-intervention self-rated lifestyle focus area scores and all blood pressure readings and from participants during face-to-face meetings (three to four total meetings) over the 3 months project period. All measures were recorded on the data sheet (created in Microsoft Word) by the FCNs and forwarded to the Parish Nurse Coordinator at the end of the project period. Data received were entered on to an Excel spreadsheet and sent to the state department of health, who then reported data from all state projects to the Association of State and Territorial Health Officials (ASTHO). After the Institutional Review Board's (IRB) approval was obtained, a secondary data analysis was completed.

2.6 | Data analysis plan

The data were analyzed using SPSS 22. Descriptive statistics were performed to examine the mean, standard deviation, minimum and maximum of all blood pressure measures and lifestyle variables. The distribution of the variables were also examined. For the first objective, a repeated measure ANOVA was used to assess the differences in systolic and diastolic blood pressure readings collected before, during, and after the intervention. For the second objective, a paired *t*-test was performed to compare pre- and post-lifestyle scores. Since data were collected over two years, an independent *t*-test was used to examine whether there were differences in baseline blood pressure from 2014 to 2015.

2.7 | Ethical considerations

This project is a secondary data analysis methodology and there was no direct contact with the project participants. Additionally, participants were de-identified by the Parish Nurse Coordinator and the

project was determined to be research not involving human subjects by an Institutional Review Board.

3 | RESULTS

In 2014, 51 of the 58 participants completed the program and in 2015, 58 of the 61 participants completed the program for a total of 109 participants. Among the 61 participants in 2015, three (4.9%) were repeated participants. A secondary data analysis was completed to examine whether the intervention led to changes in blood pressure and lifestyle focus areas.

3.1 | Blood pressure readings

To determine whether there was a difference in the systolic and diastolic blood pressure (BP) of participants before, during, and after the faith community nurse monitoring and coaching intervention, measures analysis of variance (ANOVA) using BP data from first, second, and final month was completed. The mean systolic and diastolic BP decreased each month and these differences were significantly different. Post-hoc tests indicated that BP from all three measures was significantly different from one another, indicating that the intervention is effective across the three-month period (Table 1).

Independent *t*-tests were performed to compare the baseline BP from 2014 to 2015. No significant differences were found for systolic BP or diastolic BP. Further, differences were examined between males and females on baseline BP and no significant differences were found. Because improvements were made following the first program in 2014, a repeated measure ANOVA with year included as a between factor was performed. The change differences between the two years were not statistically significant (for systolic BP, $F = 0.24$, $p = .627$; for diastolic BP, $F = 0.30$, $p = .583$) (Table 2).

| BP | First month (<i>n</i> = 118) | Second month (<i>N</i> = 113) | Third month (<i>N</i> = 58) | Final (<i>N</i> = 109) |
|------------------------------------|----------------------------------|-----------------------------------|----------------------------------|---------------------------------|
| Systolic BP (mmHg) ^a | 142.82 (17.57) Range: 106–192 | 135.16 (16.99) Range: 94–218 | 131.95 (15.53) Range: 104–183 | 127.95 (15.47) Range: 93–169 |
| Diastolic BP (mmHg) | 83.12 (11.49) Range: 55–133 | 78.95 (10.49) Range: 54–118 | 75.88 (9.81) Range: 52–103 | 75.99 (9.49) Range: 52–103 |
| Systolic BP range | | | | |
| <140 mmHg | 57 (48.3%) | 73 (64.6%) | 41 (70.7%) | 87 (79.8%) |
| ≥140 mmHg | 61 (51.7%) | 40 (35.4%) | 17 (29.3%) | 22 (20.2%) |
| Diastolic BP range | | | | |
| <90 mmHg | 83 (70.3%) | 97 (85.8%) | 53 (91.4%) | 101 (92.7%) |
| ≥90 mmHg | 35 (29.7%) | 18 (14.2%) | 5 (8.6%) | 8 (7.3%) |

TABLE 1 Blood Pressure Measurements

^aFor systolic BP, using three time points (first, second, and final month), repeated measures analysis of variance (ANOVA) indicated statistically significant differences among the three measures $F_{2,210} = 41.34$, $p < .001$. All three measures were significantly different from one another. For diastolic BP, repeated measures ANOVA indicated statistically significant differences among the three measures $F_{2,210} = 33.29$, $p < .001$. All three measures were significantly different from one another.

3.2 | Lifestyle satisfaction scores

At the start of the program, participants selected one or two lifestyle areas to focus on, from seven areas offered. The top three lifestyle areas selected included managing stress (53.8%), healthy weight (44.5%), and healthy activity (44.5%) (Table 3).

Paired *t*-tests were used to determine whether there were differences in the participant's satisfaction with lifestyle changes comparing

pre- and post-faith community nurse monitoring and coaching intervention. The results showed that the intervention improved participants' satisfaction with BP monitoring, healthy activity, healthy weight, managing medications, healthy eating and managing stress. Satisfaction with tobacco use is approaching significance. The smaller improvement in tobacco use could result because of the lower smoking rate. At the beginning, only two participants selected tobacco use as their learning topic (Table 4).

TABLE 2 BP Measurements in 2014 and 2015

| 2014 | | | | |
|---------------------|----------------------------------|----------------------------------|----------------------------------|---------------------------------|
| BP | First month (n = 58) | Second month (n = 54) | Third month (n = 35) | Final (n = 51) |
| Systolic BP (mmHg) | 141.86 (18.00) Range: 106–192 | 135.76 (17.56) Range: 104–218 | 131.71(14.54) Range: 104–157 | 129.82 (16.94) Range: 93–169 |
| Diastolic BP (mmHg) | 81.45 (9.84) Range: 58–96 | 77.96 (11.75) Range: 54–116 | 73.89 (9.65) Range: 52–91 | 75.86 (10.46) Range: 52–97 |
| Systolic BP range | | | | |
| <140 mmHg | 31 (53.4%) | 33 (61.1%) | 25 (71.4%) | 39 (76.5%) |
| ≥140 mmHg | 27 (46.6%) | 21 (38.9%) | 10 (28.6%) | 12 (23.5%) |
| Diastolic BP range | | | | |
| <90 mmHg | 42 (72.4%) | 47 (87.0%) | 34 (97.1%) | 46 (90.2%) |
| ≥90 mmHg | 16 (27.6%) | 7 (13.0%) | 1 (2.9%) | 5 (9.8%) |
| 2015 | | | | |
| BP | First month (n = 60) | Second month (n = 59) | Third month (n = 23) | Final (n = 58) |
| Systolic BP (mmHg) | 143.75 (17.25) Range: 114–189 | 134.61 (16.58) Range: 94–178 | 132.30 (17.25) Range: 110–183 | 126.31 (13.99) Range: 95–168 |
| Diastolic BP (mmHg) | 84.73 (12.76) Range: 55–133 | 79.85 (9.21) Range: 57–100 | 78.91 (9.44) Range: 63–103 | 76.10 (8.64) Range: 57–103 |
| Systolic BP range | | | | |
| <140 mmHg | 26 (43.3%) | 40 (67.8%) | 16 (69.6%) | 48 (82.8%) |
| ≥140 mmHg | 34 (56.7%) | 19 (32.2%) | 7 (30.4%) | 10 (17.2%) |
| Diastolic BP range | | | | |
| <90 mmHg | 41 (68.3%) | 50 (84.7%) | 19 (82.6%) | 55 (94.8%) |
| ≥90 mmHg | 19 (31.7%) | 9 (15.3%) | 4 (17.4%) | 3 (5.2%) |
| Pooled data | | | | |
| | First month (n = 118) | Second month (N = 113) | Third month (N = 58) | Final (N = 109) |
| Systolic BP (mmHg) | 142.82 (17.57) Range: 106–192 | 135.16 (16.99) Range: 94–218 | 131.95 (15.53) Range: 104–183 | 127.95 (15.47) Range: 93–169 |
| Diastolic BP (mmHg) | 83.12 (11.49) Range: 55–133 | 78.95 (10.49) Range: 54–118 | 75.88 (9.81) Range: 52–103 | 75.99 (9.49) Range: 52–103 |
| Systolic BP range | | | | |
| <140 mmHg | 57 (48.3%) | 73 (64.6%) | 41 (70.7%) | 87 (79.8%) |
| ≥140 mmHg | 61 (51.7%) | 40 (35.4%) | 17 (29.3%) | 22 (20.2%) |
| Diastolic BP range | | | | |
| <90 mmHg | 83 (70.3%) | 97 (85.8%) | 53 (91.4%) | 101 (92.7%) |
| ≥90 mmHg | 35 (29.7%) | 18 (14.2%) | 5 (8.6%) | 8 (7.3%) |

For 2014, for systolic BP, $F_{2,94} = 10.51, p < .001$; For diastolic BP, $F_{2,94} = 9.78, p < .001$; $n = 48$ were included in repeated measure ANOVA. For 2015, for systolic BP, $F_{2,114} = 35.57, p < .001$; For diastolic BP, $F_{2,114} = 25.22, p < .001$, $n = 58$ were included in repeated measure ANOVA. For pooled data, for systolic BP, the within factor is $F_{2,208} = 39.74, p < .001$; the between year factor was $F_{1,104} = 0.24, p = .627$. For diastolic BP, $F_{2,208} = 32.01, p < .001$; the between year factor was $F_{1,104} = 0.30, p = .583$.

A univariate general linear model was used to compare the satisfaction score on each learning topic between participants who selected the topic versus those who did not, controlling for the first month satisfaction with the same learning topic (used as covariate) (Tables 5 and 6).

TABLE 3 Participant Characteristics and Self-selected Lifestyle Focus Areas (N = 119)

| Variable | Frequency (%) |
|--|---------------|
| Year | |
| 2014 | 58 (48.7) |
| 2015 | 61 (51.3) |
| Gender | |
| Male | 36 (30.3) |
| Female | 83 (69.7) |
| Lifestyle areas selected by participants | |
| BP self-monitoring | 45 (37.8) |
| Healthy activity | 53 (44.5) |
| Healthy weight | 53 (44.5) |
| Managing medications | 11 (9.2) |
| Healthy eating | 35 (29.4) |
| Tobacco use | 2 (1.7) |
| Managing stress | 64 (53.8) |
| Other | 0 |

3.3 | Participant referrals to a provider

The referral part of the program was not well-defined or documented in the first year, so only results for the year two were analyzed. In year two, 29.5% were referred to a physician by the faith community nurse and 70.5% were not. Referral to a health care provider was documented for month one, month two, month three, and the final visit. For month one, 11 participants (18.6%) received referral. For month two visit, 10 participants received referral (16.9%). Among the 23 participants who had data for month three visit, 3 (13.0%) received referral. For final visit, one participants (1.8%) received referral (Table 7). To evaluate if referral is related to participants satisfaction and BP reduction, the four monthly referrals were combined to create one overall referral variable. If participants received a referral for any visit, referral was coded as one (yes). For participants who did not receive any referral, the referral was zero (no). Among the 61 participants in 2015, 18 (29.5%) received physician referrals and 43 (70.5%) did not (Table 7). Of the 18 who were referred, 14 followed-up with a visit to their primary care physician. Using univariate general linear models, participant's satisfaction with lifestyle teaching and blood pressure measures were then compared among those who received referral versus participants who did not receive a referral. The only significant difference is in diastolic BP, which was higher in the participants who were referred to a physician was higher than those who were not referred ($p < .01$) (Table 8).

| | 1st month M (SD) | Final month M (SD) | t value ^a | p |
|----------------------|---------------------|-----------------------|----------------------|-----------------|
| Satisfaction with | | | | |
| BP self-monitoring | 5.31 (3.37) | 8.97 (1.66) | 11.30 | <.001 |
| Healthy activity | 6.05 (2.59) | 7.91 (1.82) | 10.44 | <.001 |
| Healthy weight | 5.25 (2.86) | 6.69 (2.56) | 6.69 | <.001 |
| Managing medications | 8.87 (2.02) | 9.55 (1.19) | 4.69 | <.001 |
| Healthy eating | 0.33 (0.47) | 8.17 (2.14) | 33.99 | <.001 |
| Tobacco use | 9.52 (1.82) | 9.65 (1.51) | 1.88 | .063 |
| Managing stress | 0.55 (0.50) | 7.40 (1.86) | 35.09 | <.001 |

^aPaired *t*-tests were used to compare the means across time. Significant results are bolded.

TABLE 4 Satisfaction with Lifestyle Factors Before and After the Intervention

| | 1st month M (SD) | Final month M (SD) | t value ^a | p |
|-------------------------------|---------------------|-----------------------|----------------------|-----------------|
| Satisfaction with | | | | |
| BP self-monitoring (n = 36) | 4.47 (3.18) | 9.31 (1.17) | 9.35 | <.001 |
| Healthy activity (n = 48) | 5.02 (2.32) | 7.38 (1.87) | 9.62 | <.001 |
| Healthy weight (n = 49) | 3.92 (2.14) | 6.22 (2.44) | 6.63 | <.001 |
| Managing medications (n = 11) | 6.91 (3.18) | 9.36 (0.81) | 3.15 | .010 |
| Healthy eating (n = 33) | 5.36 (2.06) | 7.15 (1.87) | 7.66 | <.001 |
| Managing stress (n = 56) | 5.36 (2.34) | 7.25 (1.96) | 7.67 | <.001 |

^aPaired *t*-tests were used to compare the means across time. Significant results are bolded. Tobacco use was not included because of small sample size.

TABLE 5 Satisfaction with lifestyle factors before and after the intervention among participants who selected the topic as their learning goal (mean [SD])

TABLE 6 Adjusted Mean Differences in Final Satisfaction Scores Between Participants Who Selected and Not Selected the Topic, Controlling for the Satisfaction at the Beginning

| Satisfaction with | Not selected | Selected | F | p |
|----------------------|---------------|----------------|------|-------------|
| BP self-monitoring | 8.71 (n = 66) | 9.45 (n = 36) | 5.11 | .026 |
| Healthy activity | 7.93 (n = 54) | 7.89 (n = 48) | 0.02 | .895 |
| Healthy weight | 6.28 (n = 52) | 7.13 (n = 49) | 4.18 | .044 |
| Managing medications | 9.47 (n = 92) | 10.25 (n = 11) | 7.47 | .007 |
| Healthy eating | 8.21 (n = 69) | 8.08 (n = 33) | 0.11 | .746 |
| Managing stress | 8.21 (n = 45) | 8.08 (n = 56) | 1.29 | .259 |

Adjusted means are reported. Significant results are bolded.

TABLE 7 Description of Physician Referral and Comments on the Three Month Period

| | 1st month | 2nd month | 3rd month | Final |
|--|----------------------|----------------------|---------------------|---------------------|
| Physician referrals (yes) | 21 (28.4%) n = 74 | 19 (25.0%) n = 75 | 9 (27.3%) n = 33 | 8 (11.4%) n = 70 |
| Comments include Started on Medication (yes) | 41 (61.2%) n = 67 | 3 (4.4%) n = 68 | 2 (7.1%) n = 28 | 3 (4.6%) n = 65 |

This is relevant to 2015 data only.

TABLE 8 Adjusted Mean Differences in Final Satisfaction Scores and BP Measures Between Participants Who Received Referral to Physician Verses Those Not Referred, Controlling for the Satisfaction and BP at Month 1 Visit

| Satisfaction with | Not referred | Received referral | F | p |
|----------------------|-----------------|-------------------|-------|-------------|
| BP self-monitoring | 8.77 (n = 39) | 8.39 (n = 19) | 0.562 | .457 |
| Healthy activity | 7.93 (n = 39) | 7.34 (n = 17) | 2.911 | .094 |
| Healthy weight | 6.00 (n = 39) | 6.52 (n = 17) | 0.728 | .397 |
| Managing medications | 9.56 (n = 39) | 9.12 (n = 17) | 2.56 | .116 |
| Healthy eating | 7.79 (n = 39) | 7.96 (n = 17) | 0.105 | .747 |
| Tobacco use | 9.63 (n = 39) | 9.62 (n = 17) | 0.002 | .961 |
| Managing stress | 7.44 (n = 39) | 7.16 (n = 17) | 0.38 | .540 |
| Systolic BP (mmHg) | 124.63 (n = 40) | 130.04 (n = 18) | 1.842 | .180 |
| Diastolic BP (mmHg) | 74.20 | 80.33 | 7.716 | .007 |

Significant results are bolded.

4 | DISCUSSION

Participation in the 2015 program was greater than that in 2014, possibly attributed to word spreading about the opportunity to participate. Additionally, more females than males participated. Replication of the program should consider how to better recruit male participants and compare progress and outcomes among males versus females participants, as well as age groups and ethnicity.

The first, second, and final systolic and diastolic blood pressure measures all declined, showing statistically significant differences from one another. This indicates that the intervention and participant's commitment to health goals and lifestyle changes had a positive impact on blood pressure. No statistically significant results were found in comparing systolic to diastolic readings and males to females participant readings from year one to year two.

Satisfaction with lifestyle scores compared with before and after the intervention were statistically significant in six out of seven areas chosen (the area of tobacco use was not statistically significant). In comparing the final scores among participants who selected areas to those who did not select areas, the areas of blood pressure self-monitoring, healthy weight and managing medications were

statistically significant among those who did not select this area. This shows that heart-healthy lifestyle areas and changes are closely related and can be improved even while focusing on other areas. Given this finding, it still seems reasonable to have participants focus on one or two areas so that self-management and meeting health goals are successful and not overwhelming to participants.

Those referred to a health care provider only showed significant difference in diastolic blood pressure. Replication of a similar program must have a stronger referral process in place for those identified as prehypertensive and hypertensive in the community and measure if referrals resulted in follow-up, treatment, and improved blood pressure.

Overall, the data analysis showed a statistically significant decrease in blood pressure and an increase in the lifestyle satisfaction scores in this at-risk population because of the faith community nurse interventions of blood pressure monitoring, physician referral, and lifestyle coaching. The success of this program, as supported by the data analysis, contributes to advancement of evidence-based faith community nursing interventions to supplement care of those with or at-risk for hypertension in communities. Additionally, showing the effect of this intervention through the data analysis contributes to making a stronger case for replication in other communities to produce similar population health outcomes.

4.1 | Limitations

While the data show that the interventions of FCNs working with at-risk or hypertensive parishioners was effective in improving blood pressure and lifestyle changes, there were limitations. First, the study did not use a comparison group, which could have provided greater evidence and generalizability. The positive effect of this intervention in a short time frame lends itself to further study of the faith community nursing role in hypertension prevention, as well as in other chronic disease areas. Increased time and resources could contribute to greater recruitment and retention of participants, result in a larger sample size, and provide greater support to participants who could benefit from a longer period of coaching and self-monitoring.

The collection of data was a challenge overall without the presence of electronic methods to collect and sort data from the community setting. The presence of a paid coordinator provided a point person to standardize processes and expectations for collecting data, and organizing the data once received. Participant gender was the only demographic data collected. The identification of demographics such as age, ethnicity, and educational level would have allowed for comparison of social determinants of health and existing disparities. Additionally, there was limited consistent data showing the effect of the participants being referred by a FCN to a physician. When community and clinical linkages are strong, they support a referral process that provides a greater continuum of care to those with chronic conditions.

While the FCNs are qualified and willing volunteers, and faith communities are supportive settings, there are limits in what can be asked of professional volunteers in such a setting. Physical health is only one part of the holistic ministry and outreach provided by the FCNs. Integrating goals and collecting data that is tied to a state and national initiative can be challenging without external support. Therefore, faith communities and FCNs, who volunteer their time, benefit greatly from the ongoing support of a paid coordinator and sponsoring institution. The support that was offered in this project included financial support, FCN educational preparation, competency validation, and standardization of FCN interventions and documentation. Not all agencies see the value or understand the extent of ongoing support that is needed to engage such partners. Sharing outcomes such as these, makes the case that faith communities and FCNs are valuable community partners.

The Health Impact Pyramid (Frieden, 2010) and the CDC *HI-5* model (Centers for Medicare & Medicaid Services, 2016a) represent the need for using what is learned from clinical interventions and counseling to address community-wide issues that address social factors and make healthy choices the easier choices for greater population impact. The pyramid represents how clinical interventions and counseling are the only tip of the proverbial iceberg. This is where the national partners play a part in helping state and local partners create partnerships, develop interventions, collect and analyze data, and advocate for policy change for maximum impact among populations. While this project was an opportunity for a local

program to connect with and contribute to a larger initiative, programs like these will continue to be limited in scope and resources if they are not integrated into the larger system working to address chronic health needs.

4.2 | Recommendations

Health reform and the resultant change in the way health care is delivered begs the need for partnerships between public health and faith communities. The needs of those with chronic illness are most evident when a patient is discharged from an acute care setting back into a community. There are multiple medical and social needs post-discharge that discharge planning alone cannot remedy, especially for the long-term. There is a need to prevent emergency room overuse as well as hospital admission and readmission among a growing U.S. aging population burdened with chronic disease (Schroepfer, 2016). It is also known from extensive research in the management of chronic conditions that they are neither efficiently nor effectively managed in the health care setting (Holman & Lorig, 2004).

Faith community and public health partnerships are best achieved when partners are willing to understand the mission and limitations of the other partner and confront possible bias about one another. First, public health must recognize that some faith communities could be skeptical of working with health care providers or government-run agencies because of potential for mistrust (Author, 2006). Additionally, public health needs to understand the mission of the faith community. While these partnership could be helpful in addressing a variety of community issues, and faith communities seemingly may have a wealth of resources to respond to such issues, it is not the sole purpose of faith communities. Partners should be intentional about discussing what is most realistic for each to offer to one another. Public health may offer training or professional development opportunities while faith communities offer space or volunteers for public health events or services. Public health agencies who wish to connect with faith communities should consider who they already know in the community. Faith community nurses and public health nurses may be serving together on the same community coalitions and these relationships can be strengthened. Public health should consider identifying and reaching out to vibrant and highly involved congregations and faith coalitions. The Westberg Institute for Faith Community Nursing (The Church Health Center, n.d.) is a resource for public health to learn more about faith community nursing, regional networks and educational training sites.

Based on the results of this study showing the effectiveness of the FCNs, nurses are the ideal health professionals to develop and maintain faith community and public health partnerships. Nurses comprise the largest group of health care and public health professionals in the U.S. (Robert Wood Johnson Foundation (2013) and there are approximately 17,000 practicing FCNs in the U.S. (The Church Health Center, n.d.). As fellow health care providers, FCN and public health nurses speak the language of nursing and can connect well with acute and primary care nurses. Creating a culture of health (Robert Wood Johnson Foundation (2015a) aligns

with public health's mission to assure the conditions in which people can be healthy (Centers for Disease Control and Prevention, 2013) and the faith community's mission to holistically serve their congregation and community. Nurse-led initiatives that include a return on investment, strong partnerships, best practices, and leadership in community settings are necessary to build the culture of health (Robert Wood Johnson Foundation, 2015b). In 2016, the U.S. Department of Health & Human Services announced the funding to pilot the Accountable Health Communities model, which intends to bridge the clinical and community services and focuses more on social factors that influence health (Centers for Medicare & Medicaid Services, 2016b). Faith community nurses and public health nurses, in their vast size and settings, are the bridge between community and clinical services and are able to recognize the social determinants that contribute to health.

While the tenants of faith community and public health nursing practice are prevention and population health, the funding of these remains a missing piece (Prevention Institute, 2013). The U.S. health care system remains focused on illness care and state and local public health budgets have been drastically cut since 2008 (Trust for America's Health, 2013). In addition, only about one-third of the FCNs are paid (The Church Health Center, n.d.). Yet, the public and health care providers rely on services provided by public health and faith communities, who are not funded as equal partners or for sustainability (Levin, 2014). It is unrealistic to expect that community partners can continue to produce positive population health outcomes with limited and inconsistent funding. Leaders within faith communities, health systems and public health must consider sustainable funding mechanisms for FCN and public health nurses, as their collaborative efforts are proving they can positively affect population health outcomes.

5 | CONCLUSION

This Million Hearts initiative shows the value of a partnership between faith communities, a health system, and public health. The FCNs in this project helped participants to meet health goals and learn skills of self-management to positively influence hypertension. Evidence from the Million Hearts initiative, at the national, state, and local level, demonstrates a need for ongoing community assessment and support of populations outside of health care settings. The goal is to identify and monitor chronic disease, as well as to promote self-management and lifestyle changes. Faith community and public health nurses are competent in analytic assessment skills that identify risks and strengths at the community level (Public Health Foundation, 2011). They can support acute and primary care providers through continued outreach to where the population lives, learns, works, plays, and prays. Now that the Million Hearts initiative has described the "who, what, and where" of hypertension and related heart disease and stroke risk in the U.S. (Centers for Medicare & Medicaid Services, 2012), nurses in the community must respond by disseminating evidence from approaches aimed at preventing and controlling hypertension and creating sustainable, systems change.

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