Research Article

Process Evaluation of *Strong Hearts, Healthy Communities*: A Rural Community-Based Cardiovascular Disease Prevention Program

Urshila Sriram, MSPH[1,*]; Kirstin Sandreuter, BS[1,*]; Meredith Graham, MS[1]; Sara Folta, PhD[2]; Kristin Pullyblank, MS, RN[3]; Lynn Paul, PhD[4]; Rebecca Seguin, PhD, CSCS[1]

ABSTRACT

Objective: To evaluate the implementation of a community-based cardiovascular disease prevention program for rural women: *Strong Hearts, Healthy Communities* (SHHC).

Design: Mixed-methods process evaluation.

Setting/Participants: A total of 101 women from 8 rural towns were enrolled in the SHHC program; 93 were enrolled as controls. Eligible participants were aged ≥40 years, sedentary, and overweight or obese. Local health educators (n = 15) served as program leaders within each town.

Outcome Measures: Reach, fidelity, dose delivered, dose received, and program satisfaction were assessed using after-class surveys, participant satisfaction surveys, interviews with program leaders, and participant focus groups.

Analysis: Descriptive statistics, chi-square tests of independence, and thematic analysis were employed.

Results: Intervention sites reported high levels of fidelity (82%) and dose delivered (84%). Overall reach was 2.6% and program classes were rated as effective (3.9/5). Participants were satisfied with their experience and reported benefits such as camaraderie and awareness of healthy eating and exercise strategies. Common recommendations included increasing class time and enhancing group discussion.

Conclusions and Implications: Implementation was good in terms of fidelity, dose delivered, and satisfaction, although low reach. Findings from this research have informed a second round of implementation and evaluation of the SHHC program in rural communities.

Key Words: cardiovascular disease, health promotion, program evaluation, rural population, women's health (*J Nutr Educ Behav.* 2019;51:138−149.)

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INTRODUCTION

Cardiovascular disease (CVD) remains the leading cause of mortality among US adults, imposing a significant burden on health care resources and individuals' quality of life.[1] Despite advances in treatment and prevention, geographic and gender disparities in CVD persist.[2−5] Residents of rural areas have a higher prevalence of CVD and associated risk factors (eg, excess weight, poor diet, and physical inactivity) compared with their urban counterparts.[3,4,6,7] Rural women are particularly vulnerable owing to socioeconomic and environmental disadvantage, such as limited access to nutritious foods, safe places to exercise, and preventive and specialty care.[4,5,8−14]

There is strong evidence suggesting that lifestyle improvements in health behavior (eg, diet) can significantly reduce the risk for CVD.[1,15,16] Existing community-based lifestyle intervention programs have shown promise in changing women's health behaviors; however, few programs specifically targeted rural, medically underserved populations or focused on CVD prevention.[17−21] Furthermore, there has been limited assessment of implementation processes, which is essential for understanding program effectiveness and suitability for particular contexts.[22]

Lifestyle intervention programs are often unavailable or financially inaccessible to women living in medically underserved rural areas. Additional challenges to program delivery

[1]Division of Nutritional Sciences, Cornell University, Ithaca, NY
[2]Friedman School of Nutrition Science and Policy, Tufts University, Boston, MA
[3]Bassett Research Institute, Cooperstown, NY
[4]College of Education, Health and Development, Montana State University, Bozeman, MT
*Ms Sriram and Ms Sandreuter are co-first authors.
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Address for correspondence: Rebecca Seguin, PhD, CSCS, Division of Nutritional Sciences, Savage Hall, Room 412, Cornell University, Ithaca, NY 14853; E-mail: rs946@cornell.edu

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may include transportation barriers, space constraints, and limited food and physical activity resources.[23] Offering low-cost programming to rural women who are at risk may reduce disparities in resource availability. Thus, there is a need for tailored intervention approaches that adequately address these challenges and evaluate implementation processes in rural settings.

Implementation evaluations typically include assessments of reach, fidelity, dose delivered, dose received, and satisfaction.[22,24] Integrating quantitative and qualitative data from multiple sources is often recommended to provide a more comprehensive assessment of program implementation.[25] Qualitative methods, such as focus groups, are especially valuable because they allow participants' experiences to inform program modifications.[26] By documenting successful and challenging aspects of program content and delivery, qualitative findings can tailor intervention components to meet specific community needs.

The current study describes a mixed-methods process evaluation of a rural community-based CVD prevention program for midlife and older women. Care was taken to include lesson topics and lifestyle intervention strategies to address rural-specific barriers to healthy living.[27,28]

METHODS

This work was conducted as part of a community-randomized trial to reduce CVD risk among rural women in Montana and New York: *Strong Hearts, Healthy Communities* (SHHC).[15] The program integrated core concepts from 3 nationally disseminated evidence-based curricula developed for rural areas: *StrongWomen Strength Training*,[29] *StrongWomen Healthy Hearts* (SWHH),[21] and the *HEART Club*.[30] Focus groups, key informant interviews, and community assessments conducted in partnership with local health educators informed the integration of curriculum components to ensure a robust, tailored intervention.[15,27,28]

The SHHC intervention program was designed to act on multiple levels of the socioecological framework.[31] Individual level components, including strength training and aerobic exercise, were drawn from *StrongWomen Strength Training* and SWHH curricula, whereas nutrition education and behavioral strategies, including goal setting and stress management, were based on SWHH.

Because rural homes are often located along busy highways or in isolated areas with limited walkability, the program emphasized indoor physical activity options and provided at-home exercise support materials.[28] Similarly, class recipes included ingredients available in local food stores and nutrition information was tailored to rural food preferences (eg, wild game).[27,32] The intervention was also designed to target the social environment (friends and family) and the built environment through the *HEART Club* civic engagement component.[15] The primary outcome for the 6-month intervention trial was change in participant body weight; secondary outcomes were changes in other CVD risk factors.[15,33]

SHHC was delivered to participants 2 times/wk for an hour over 6 months (48 sessions), with additional out-of-class meetings as needed.[15] To encourage consistent attendance, SHHC participants were offered a $50 Amazon gift card for attending ≥90% of program classes and a $25 Amazon gift card for attending 80% to 89% of classes. Supplementary Data highlights the behavioral aims and intervention components covered during each phase of the SHHC program.

Recruitment and randomization were carried out at the town level. Towns eligible for participation were classified as Rural–Urban Commuting Area code ≥7 or higher and designated as medically underserved.[34] Towns were matched according to population size and Rural–Urban Commuting Area code and randomized 1:1 to deliver the SHHC intervention program or an education-only minimal intervention control program.

Local health educators with extensive program delivery experience were chosen to serve as program leaders within each participating town. These educators were affiliated with Cooperative Extension offices or rural health care centers and were members of the local community. Leaders worked in pairs with coordinators or alone to recruit eligible women, assist with screening and data collection procedures, and facilitate program classes. Coordinators were Extension paraprofessionals or health care center employees who were also well connected to the community. Recruitment strategies included advertising at community venues (eg, flyers, information tables), targeted direct mailing, newspaper ads, website posts, and word of mouth referrals. Eligible participants were aged ≥40 years, English-speaking, and currently sedentary, with a body mass index ≥ 25.

In addition to completing human subjects' ethics training, leaders received extensive training in study procedures and curriculum facilitation through in-person workshops and interactive webinars. Training sessions covered SHHC program background, foundational knowledge related to curriculum content (eg, nutrition and physical activity recommendations), guidelines for program facilitation, and sample lessons. Leaders and coordinators also received a comprehensive guidebook that included the full program curriculum and materials needed for facilitation. Weekly phone calls were held with leaders and coordinators throughout the intervention period to address program-related questions or issues, as well as encourage similar delivery of the intervention across sites.

Procedures and Measures

Implementation of the SHHC intervention program was assessed using a mixed-methods process evaluation design. Evaluation measures were adapted from Saunders et al[24] and the Medical Research Council's guidance for process evaluation of complex interventions.[22] Table 1 summarizes the measures and data collection methods used. Reach into the target population was calculated as the number of SHHC participants in each town divided by the total number of eligible women multiplied

Table 1. *Strong Hearts, Healthy Communities* (SHHC) Process Evaluation Measures and Data Collection Methods

Measure	Definition[a]	Method of Data Collection	Data Collected	Personnel Collecting Data
Reach	Proportion of individuals participating in intervention (participation rate)	Enrollment records; US Census data	Number of SHHC participants Total number in target population	Research team
Participant adherence	Percentage of program classes attended (attendance rate)	After-class survey	Attendance at SHHC classes	Program leaders
Fidelity	Extent to which intervention was delivered as planned (quality)	After-class survey	Adherence to curriculum components for each SHHC class	Program leaders
Dose delivered	Amount of intervention delivered in any form (completeness)	After-class survey	Delivery of curriculum components for each SHHC class	Program leaders
Dose received	Extent to which participants were exposed and receptive to intervention (exposure)	After-class survey	Effectiveness of SHHC classes for participants Total time spent in class during SHHC program	Program leaders
Program satisfaction (quantitative)	Participant satisfaction with intervention and program staff	Postintervention survey	Satisfaction with SHHC program Participation benefits Recommendations	Participants
Program satisfaction (qualitative)	Participant satisfaction with intervention and program staff	Participant focus groups; program leader interviews	Experiences participating in and facilitating SHHC program	Participants and program leaders

[a]Adapted from Saunders et al.[24]

by 100. The number of eligible women in each town was estimated from US Census data on the percentage of women age 40 and over and Behavioral Risk Factor Surveillance System data on the percentage of overweight/obese adults.[35,36]

To assess fidelity, dose delivered, dose received, and participant adherence, leaders were asked to complete an online survey after each program class. Checklists were used to indicate whether each lesson topic was covered and whether class materials were used during facilitation. Fidelity scores for each curriculum component were assigned as follows: 0 = not covered; 1 = yes, covered but modified; and 2 = yes, covered as prescribed. Dose delivered scores were assigned as follows: 0 = not covered; and 2 = covered in any form (including adaptations or modifications). Component scores were summed and divided by the maximum possible fidelity or dose delivered score to obtain overall percent scores for each intervention site.

Dose received was defined as participants' exposure to curriculum content and the extent to which they found this content effective.[24] Total time spent in class during the program was used as a measure of curriculum exposure. To assess effectiveness, leaders were asked to respond to the following question on a 5-point Likert scale: *In your opinion, how effective was this class for participants?* Response options ranged from *very ineffective* (1) to *very effective* (5). Participant adherence was assessed using attendance records from the after-class surveys. Measures of dose received and reach were subsequently averaged to create summary scores for each site.

To assess program satisfaction, SHHC participants were asked to complete an online survey after the intervention program ended. Survey measures included satisfaction with the program and benefits associated with participation. Questions related to program satisfaction and participation benefits were assessed on a 5-point Likert scale. Participants were also asked a series of open-ended questions about program perceptions and suggestions for improvement.

To gain further insight into program experiences, focus group discussions were held with participants after program completion. Focus groups were conducted via Zoom's audio conference platform (version 4.0, San Jose, CA; 2017), which allowed participants to dial in using in any landline or mobile phone. This methodology was used to accommodate travel constraints, minimize costs, and engage geographically dispersed participants.[37–39] Participants were invited by program leaders to attend and received a $25 Amazon gift card for their time. Semistructured telephone interviews were also conducted with program leaders and coordinators at each intervention site. Telephone focus groups ranged from 60 to 90 minutes, whereas interviews lasted approximately 1 hour. All focus groups and interviews were facilitated by a trained interviewer and audio recorded.

Focus group and interview guides were designed to assess satisfaction with the SHHC program, with a focus on suggested improvements and modifications. The questions explored overall experiences facilitating and participating in the SHHC program, as well as experiences related to specific program components (eg, physical activity). Questions also assessed the influence of the overall SHHC program on individual, social, and environmental aspects of health.

Participants provided written informed consent for all quantitative data collection procedures upon enrollment into the SHHC study. The researchers obtained oral informed consent from all participants and program leaders before conducting the focus groups and interviews. Study procedures and materials were approved by the Institutional Review Boards at Cornell University and Bassett Medical Center.

Data Analysis

The researchers analyzed quantitative data using SAS (version 9.4, SAS Institute Inc., Cary, NC; 2018). Participant characteristics and process evaluation survey measures were summarized using means and frequencies (percentages). Demographic differences between survey respondents and nonrespondents, and focus group attendees and nonattendees were assessed using *t* tests for continuous variables and chi-square tests of independence for categorical variables. Open-ended survey responses were qualitatively coded in NVivo (version 11, QSR International Pty Ltd, Doncaster, Victoria, Australia; 2018) using the descriptive coding framework described subsequently.

Audio recordings of the focus groups and interviews were transcribed verbatim and also coded using NVivo. An initial descriptive coding framework[40] was developed around relevant topics from the interview guides and iteratively revised to incorporate emergent themes. Descriptive codes were grouped into 3 main categories: positive aspects of the program, negative aspects of the program, and recommendations for improvement. The researchers organized these codes to reflect participants' perspectives regarding the overall SHHC curriculum as well as the physical activity and nutrition education components, specifically.

All coding decisions were systematically reviewed and discussed by 3 members of the research team and a subset of the transcripts were independently double-coded. Observed agreement and adjusted kappa values were 97.6% and 95.2%, respectively, suggesting high intercoder reliability. All analyses were conducted in 2016–2017.

RESULTS

A total of 194 women from 16 rural towns (12 in Montana and 4 in New York) were enrolled in the study.[33] Of these, 101 in 8 towns (6 in Montana and 2 in New York) received the SHHC intervention program. Intervention participants were aged 41–81 years and were primarily non-Hispanic white (90%), married (67%), and either employed full-time (49%) or retired (24%). Table 2 presents the baseline sociodemographic characteristics of SHHC intervention participants.

Fifteen leaders and coordinators facilitated program classes across the 8 SHHC intervention sites. Seven sites had leaders who cofacilitated with a coordinator whereas the eighth site only had 1 leader facilitating. All leaders (n = 8) were female, non-Hispanic white, and certified in cardiopulmonary resuscitation, and had completed graduate-level academic training. All coordinators (n = 7) were female and non-Hispanic white, and had completed some college.

Reach

Overall reach was 2.6%, ranging from 6.9% in the smallest town to 0.7% in the largest town.

Fidelity and Dose Delivered

Program leaders across most sites reported high levels of adherence to the SHHC curriculum (overall fidelity = 82%). Site-specific fidelity scores ranged from 80% to 89%, with the exception of town 2 (fidelity = 63%). Dose delivered scores for each site were slightly higher than fidelity scores (overall dose delivered = 87%), which suggested that most program components were delivered as prescribed with limited modifications. Table 3 presents details about fidelity and dose delivered.

Dose Received

As shown in Table 3, program classes lasted 61–76 minutes for most sites, somewhat longer than the allocated 60-minute period. Overall, leaders rated the effectiveness of class sessions highly (3.94 of 5), although site-specific ratings varied from neutral (3.25 of 5) to very effective (4.68 of 5).

Participant Adherence

On average participants attended 67% of program classes (site range, 53% to 81%), which amounted to approximately 38 contact hours. Of the 101 participants, 20 attended ≥ 90% of program classes and 25 participants attended 80% to 89% of classes, thus qualifying for a bonus Amazon gift card. No demographic differences were observed between participants with high attendance levels (≥80%) and those with lower attendance levels (<80%).

Program Satisfaction: Mixed-Methods Questionnaire

A total of 74 SHHC participants completed the postintervention satisfaction survey. Survey respondents were significantly older than nonrespondents (n = 27) ($P < .01$; data not shown); however, no other demographic differences were observed (data not shown). Survey respondents attended 79% of program classes on average, whereas nonrespondents had a significantly lower attendance rate of 37% ($P < .001$; data not shown).

Most participants (72%) were very satisfied with the SHHC program. Specific program components (eg, lesson content) were well received and participants reported noticeable improvements in fitness and eating habits. Almost half of participants (46%) were very satisfied with their resulting health changes and over

Table 2. Sociodemographic Characteristics of *Strong Hearts, Healthy Communities* Intervention Participants

Characteristic, n (%)	Overall (n = 101)	Survey Respondents (n = 74)	Focus Group Attendees (n = 46)
Age, y (mean [SD])	59.0 (9.4)	60.6 (9.4)	58.9 (9.1)
Body mass index (mean [SD])	34.9 (6.1)	35.3 (6.3)	35.7 (6.0)
Race/ethnicity			
Non-Hispanic white	91 (90.1)	67 (90.5)	44 (95.6)
Hispanic	1 (1.0)	0	0
Other	4 (4.0)	4 (5.4)	1 (2.2)
Not reported	5 (4.9)	3 (4.1)	1 (2.2)
Education			
High school graduate or less	22 (21.8)	15 (20.3)	10 (21.7)
Associates degree or some college	30 (29.7)	22 (29.7)	11 (23.9)
College degree	28 (27.7)	21 (28.4)	11 (23.9)
Postgraduate/professional degree	14 (13.9)	12 (16.2)	12 (26.1)
Not reported	7 (6.9)	4 (5.4)	2 (4.4)
Income			
<$25,000	24 (23.8)	19 (25.7)	5 (10.9)
$25,000 to $49,999	23 (22.8)	18 (24.3)	13 (28.2)
$50,000 to $74,999	16 (15.8)	10 (13.5)	9 (19.6)
≥$75,000	25 (24.7)	18 (24.3)	14 (30.4)
Not reported	13 (12.9)	9 (12.2)	5 (10.9)
Marital status			
Married	68 (67.3)	51 (68.9)	36 (78.2)
Unmarried couple	2 (2.0)	0	0
Divorced	9 (8.9)	6 (8.1)	4 (8.7)
Widowed	14 (13.9)	12 (16.2)	5 (10.9)
Separated	1 (1.0)	1 (1.4)	0
Never been married	1 (1.0)	1 (1.4)	0
Not reported	6 (5.9)	3 (4.0)	1 (2.2)
Employment status			
Employed	50 (49.5)	35 (47.3)	26 (56.5)
Self-employed	11 (10.9)	6 (8.1)	3 (6.5)
Retired	24 (23.8)	23 (31.1)	12 (26.1)
Homemaker	6 (5.9)	3 (4.0)	3 (6.5)
Out of work	1 (1.0)	1 (1.4)	0
Unable to work	4 (4.0)	3 (4.0)	1 (2.2)
Not reported	5 (4.9)	3 (4.0)	1 (2.2)

Table 3. Process Evaluation Results by *Strong Hearts, Healthy Communities* Intervention Site (n = 8)

Site (Town)	Fidelity (%)[a]	Dose Delivered (%)[b]	Reach[c]	Classes Attended, n (%)[d]	Class Length, min	Total Class Hours	Class Effectiveness[e]
1	85.4	87.9	6.9%	29 (61.1)	62	30	4.17
2	62.6	68.9	2.0%	26 (53.5)	61	27	3.25
3	83.0	87.2	2.2%	35 (72.9)	63	37	3.77
4	86.6	92.8	1.8%	34 (70.1)	93	53	4.68
5	80.2	86.1	1.2%	27 (56.9)	61	28	4.11
6	83.0	88.5	3.6%	35 (73.4)	62	36	3.68
7	88.3	91.8	2.3%	34 (71.0)	74	42	4.26
8	89.4	92.1	0.7%	39 (81.3)	76	49	3.91

[a]Percentage of curriculum components delivered in complete form (as prescribed); [b]Percentage of curriculum components delivered in any form (as prescribed or modified/adapted); [c]Number of SHHC intervention particpants divided by the total number of eligible women in each town multiplied by 100; [d]Average number and percentage of classes attended by *Strong Hearts, Healthy Communities* intervention participants; [e]Average class effectiveness on a scale of 1 (very ineffective) to 5 (very effective).

80% said they would definitely recommend the SHHC program to other women they knew (Supplementary Data).

A total of 69% of participants reported aspects of the program they enjoyed, including camaraderie, peer accountability, and exposure to new foods. On the other hand, 93% of participants reported aspects they did not enjoy, including insufficient time to cover class content, challenging strengthening exercises, and completing participant logs. Participants (82%) also identified several areas for improvement, such as increasing class length, restructuring program content, and allowing more time for discussion (Supplementary Data).

Program Satisfaction: Qualitative Focus Groups and Interviews

A total of 46 SHHC participants attended the telephone focus group discussions. Focus groups ranged from 3 to 9 participants, with an average of 5–6/group. Eight leaders and 7 coordinators participated in the post-program interviews. Thirty women who did not attend the focus group discussions responded to the satisfaction survey whereas 2 participants who did not complete the survey were able to attend a focus group. Thus, 75% of SHHC participants were reached using both methods, compared with reaching 45% through focus group discussions alone.

Focus group attendees were more likely to hold college degrees compared with nonattendees (n = 55) ($P < .05$; data not shown); however, no other significant demographic differences were observed. Program attendance rates were significantly higher among focus group attendees (80%) compared with nonattendees (57%) ($P < .001$; data not shown). Satisfaction ratings from the post-program survey were comparably high among women who attended the focus group discussions (n = 44) and those who did not (n = 30).

Thematic findings from the focus groups and interviews are briefly described in the text and illustrated with quotations in Table 4.

Overall program. Feedback regarding SHHC was predominantly positive; the content was described as thorough and well planned. Most participants emphasized the benefits of camaraderie among group members, which motivated them to make positive lifestyle changes. Many leaders attributed the successful delivery of program components to support from their coordinator. Insufficient time to cover educational content was commonly viewed as a challenge among participants and leaders. Participants were also eager for more directive strategies for engaging family members in healthy lifestyle practices learned through the program. Among the most frequent recommendations was increasing class length by 15–30 minutes. Participants also felt that they would have benefitted from discussing specific nutrition topics (eg, meal planning) earlier in the program. Leaders and coordinators further recommended increasing goal-setting guidance and regularly monitoring progress during class.

Physical activity components. Participants, leaders, and coordinators all expressed enthusiasm for the in-class exercise sessions, commending the gradual progression of intensity, limited equipment requirements, and consistent frequency. Participants also benefitted from the support of and accountability to fellow group members. Most women enjoyed using the Fitbit trackers provided by the research team to monitor their daily step counts and compete with fellow Fitbit (Fitbit Inc., San Francisco, CA) users. However, many women struggled to keep up with fast-moving aerobic dance routines in class (eg, Zumba) and preferred the slower-paced walking videos. Leaders and coordinators also emphasized difficulties in completing the floor-based strengthening exercises owing to mobility constraints. Suggestions for improvement were to include a greater variety of easy-to-follow aerobics videos and enhance the consistency of strength-training exercises. Many leaders and coordinators also recommended adding more modifications to allow participants to complete exercises safely and effectively.

Nutrition education. Participants appreciated the range of nutrition topics covered in class and found the sessions on meal planning, portion size, and nutrition labels particularly helpful. Many women credited the program for enhancing their awareness of healthy eating strategies and reinforcing existing knowledge. The class recipes and food demonstrations encouraged many participants to use new ingredients when cooking at home. Most women expressed a willingness to prepare recipes on a rotating basis to reduce the burden on leaders and coordinators and provide a cost-sharing benefit to the program. Several women suggested the need for more prescriptive guidance on incorporating healthy eating habits into daily routines. Additional recommendations included allocating more time to discuss nutrition topics and tailoring meal planning strategies to rural areas where food access was often limited.

DISCUSSION

Understanding the implementation of lifestyle interventions for women is critical to improving intervention effectiveness and informing dissemination efforts, yet evidence from rural-specific contexts remains limited. The purpose of the current study was to evaluate the implementation of a CVD prevention program for rural women, SHHC. Previously published findings highlighted the effectiveness of the SHHC intervention in reducing CVD risk factors compared with the control program.[33] Results from this process evaluation offer additional insight into program implementation in rural settings.

High-fidelity scores (>80%) were observed across all but 1 intervention site, a level of fidelity comparable to other lifestyle interventions for adults.[41–44] This supports the use of community health educators in delivering lifestyle interventions in rural areas. Despite strong positive feedback about the program, average attendance (67%) was lower than anticipated (>75%).[21] This may be attributable to the program duration and dose (twice per week for 6 months); however, the provision of

Table 4. Lessons Learned From *Strong Hearts, Healthy Communities* Program: Focus Group (n = 46) and Interview (n = 15) Responses

Subtheme	Respondent	Select Quotations
Theme 1: Positive aspects of overall program		
Thorough and organized content	Leaders/coordinators and participants	*I just thought it was a fantastic program . . . as far as how it was organized and the content material . . . you know, it covered a wide range of topics ... and it was all very well put together and very well done.* (Participant MT 01)
Group camaraderie	Participants	*. . . In the beginning, I thought there was no way I could do this twice a week for 6 months. And then, it was just so much fun! I hated it if I had to miss 1! Just the support . . . it really provided the motivation I needed to make changes.* (Participant MT 01)
Dedication of leaders and coordinators	Leaders/coordinators and participants	*[Leaders were] very supportive! If anyone seemed like . . . they were having trouble with anything, they'd always stop and check with you to make sure that everything was okay.* (Participant NY 08) *Having a . . . co-leader was ... amazing, and I would not have been able to do it without her.* (Leader MT 05)
Theme 2: Negative aspects of overall program		
Insufficient class time	Leaders/coordinators and participants	*So often, there wasn't time to go through the curriculum ... and even when we could go through the curriculum ... there just wasn't enough time ... to make it really meaningful or powerful to them.* (Leader MT 03)
Limited social influence and support	Leaders/coordinators and participants	*I think the friends and family part of it would have been much bigger in our community if we stressed to them how much they needed to be doing this at home. It wasn't just come to the class and do it, but try to bring it home with you . . . this is not a 2-day-a-week lifestyle change, it's a 7-day-a-week lifestyle change.* (Coordinator MT 06) *I don't know how effective it [social support content] was for the women ... a lot of them have stress in their lives that I can't even relate to. . . . A big problem for our participants was that their husbands, or their families, refused to eat healthy . . . so they ended up having to make 2 dinners. And so, it's always this constant difficulty for them.* (Coordinator MT 03)
Theme 3: Recommendations for overall program		
Extending class time	Leaders/coordinators and participants	*. . . The class was not long enough [laugh] ... It was supposed to be an hour ... but it was just not enough time. Most of the time it averaged, I would say an hour and a half ... and it didn't seem to bother them. So, I think if you're going to have the education piece and the exercise bit ... you definitely need to have more than just an hour.* (Leader MT 04) *One of the things I would see as a change in the program would be to have more time for the discussion groups. . . . When we got into having a half hour of aerobic exercise and then 15 minutes of strength training, it didn't really leave any time to discuss all the stuff that was in the book.* (Participant NY 07)

(continued)

Table 4. (*Continued*)

Subtheme	Respondent	Select Quotations
Reorganizing content	Leaders/coordinators and participants	*The food portion . . . such as meal planning and . . . dealing with family, that was more toward the end of the curriculum ... that would be a great thing just to start out with. That way they're trying to make those changes from the beginning.* (Coordinator MT 04)
Emphasizing goal setting	Leaders/coordinators	*. . . I think that the goals are very important. But we didn't follow through with the goals! To me, if I was changing the curriculum, every week we would have had a goal. You set your goals, and you ... look at your neighbor and say, "Here's my goals." Then you follow back up on them.* (Leader MT 02)
Theme 4: Positive aspects of physical activity components		
Exercise enjoyment	Leaders/coordinators and participants	*I'm just glad you introduced us to the walking videos . . . in the winter, to go outside and walk . . . I guess you could do it, but if it's icy or something, you're not going to. And those videos, they really give you what you need, and by the time you're done, that 30 minutes doesn't seem like 30 minutes!* (Participant MT 03)
Peer support and accountability	Participants	*And I know it's a lot easier to do lunges and squats with that group than it is when I'm [laugh] by myself, I'm like, "Oh yep, 7, I'm done."* (Participant_MT_02)
Fitbit use	Participants	*My motivation was the Fitbit ... because I have been dealing with my illness for 2 years, and it pulled me out of a ... slump, because it gave me a reason to move ... and I did not, honest to God, quit until I hit that 10,000 steps, every day, and ... it was the greatest thing.* (Participant MT 01)
Theme 5: Negative aspects of physical activity components		
Complex aerobic routines	Leaders/coordinators and participants	*In the aerobic dance, they're moving across the floor in different directions . . . and people would get a little discombobulated ... you're not really working out, you're just trying to stay where you're supposed to be ... people weren't able to follow that quite as easily, so it got a little off-track.* (Leader MT 02)
Inconsistent and difficult strength training	Leaders/coordinators	*So, for weights ... when we were following the curriculum it was sporadic, so you might do ... bicep curls, squats, and lunges today, but then we didn't do those 3 things again over the next month. And so, those women, unless they were doing them at home, didn't gain any benefit from just doing their reps that 1 day.* (Coordinator MT 02)
Theme 6: Recommendations for physical activity components		
Improving variety and consistency	Leaders/coordinators and participants	*It would be nice to get into a pattern . . . If we're meeting on Tuesdays and Thursdays, we're going to go through and we're going to do all of these exercises ... maybe we have to whittle it down a little, but we're going to do all of them twice a week, so that way they get a consistent benefit.* (Coordinator MT 02) *I guess there could have been a little more variety. ... We bought some videos ourselves, and a lot of us had different ones. ... Maybe that could*

(continued)

Table 4. (*Continued*)

Subtheme	Respondent	Select Quotations
		have been something ... a few times have members bring in the videos they like ... just to mix it up a little. (Participant MT 06)
Modifying strength exercises	Leaders/coordinators	*And some of them weren't willing ... to get or able to get down on the ground, so having alternatives for those folks, I mean even though the goal is to give them the confidence that if they ... did fall or anything, they could get back up and to try to build some of that ... balance and coordination.* (Leader NY 07)
Theme 7: Positive aspects of nutrition education		
Awareness of healthy strategies	Participants	*It just makes you more aware, and you're ... reading labels more ... thinking more about ... portion size . . . and what you're eating ... those kinds of things ... so, yes, it was worthwhile!* (Participant NY 07)
Exposure to new foods	Participants	*You know, they made a lot of snacks that I enjoyed, that I wouldn't have thought about eating ... that were really quite good, and I probably wouldn't have tried them if I would have just read the recipe ... but after trying them I definitely would have made some of them.* (Participant MT 06)
Theme 8: Negative aspects of nutrition education		
Extensive preparation time	Leaders/coordinators	*. . . They took so much of our time to prepare ... we were having to use what would have regularly been office time and after-hours time ... so that we could get them to the class every night.* (Leader MT 04)
Limited applicability	Leaders/coordinators	*I think we gave out a lot of information, and I think we needed to be a little more proactive . . . we just gave out information, but there wasn't a whole lot of accountability, so it was like, "Here's this, do what you will with it" . . . So, a lot of people, they close their binders, they go home, that's the end of it.* (Leader MT 02)
Inadequate food access	Leaders/coordinators and participants	*In a rural area . . . we don't quite have access to all the healthier-type foods. . . . When you go into the big cities, the produce department is humungous. . . . In my community, it's probably about a 20-ft section [laugh]. That's about 4 ft deep. ... And it's expensive, a lot of fresh produce around here is expensive.* (Participant MT 03)
Theme 9: Recommendations for nutrition education		
Sharing food preparation	Leaders/coordinators and participants	*... We're going to continue in September, start up again, just 'cause summer's busy, and they were willing to [bring snacks]. ... Especially now that the funds aren't there ... that'll be excellent for our group.* (Coordinator_MT_04)
Increasing discussion time	Participants	*... We all knew a lot of the information, but when somebody would say, "Oh! This has really worked for me!". . . There was a lot of ideas on getting your water intake ... some people were really struggling with that . . . and I don't know, we got a lot from each other* (Participant MT 06)

an attendance bonus might have buffered this impact. Attendance for the first 3 months of the SHHC program averaged 81%, which is similar to or higher than that of other programs of a similar duration, which reported attendance rates between 75% and 80%.[21,45]

Overall, SHHC participants were highly satisfied with the program and would readily recommend it to other women in their community. Similar to previous studies among rural women, participants discussed the benefits of peer support and social interaction in keeping themselves accountable and motivated.[12,27,46] Despite long commutes and busy schedules, women looked forward to the weekly classes and willingly set aside time to attend. Self-monitoring with Fitbit trackers was another effective strategy to promote daily activity. This supports existing research highlighting the feasibility of automated fitness trackers among older adults and women.[47,48]

Most recommendations were related to integrating program components rather than contextual challenges (eg, limited space and financial constraints), which suggests that the SHHC program adequately addressed rural-specific barriers to implementation. These findings echo results from previous *StrongWomen* program evaluations, which reported sufficient funding and resources for program delivery.[29,44] However, several participants felt that some program recipes and meal planning strategies should better account for the high cost and limited availability of healthy food in rural areas.

Key recommendations included increasing strength training and exercise variety, changing the order of curriculum components, and allocating more time for instruction. Future iterations of the SHHC program should include additional aerobic exercise DVDs, consistent strength training schedules, and earlier introduction of nutrition education topics (ie, within the first month). If possible, lessons should be extended or streamlined to allow for richer group discussions and more time to cover program content. Although many SHHC participants expressed willingness to attend longer sessions, it might be unrealistic to expect this time commitment from all individuals.

Some limitations of this research should be noted. First, the SHHC program was specifically designed to reduce CVD risk among midlife and older rural women who were sedentary and overweight/obese. As such, findings from this process evaluation cannot be generalized to other rural populations or lifestyle intervention programs. Second, measures of fidelity and dose were assessed only by leaders, which might have positively biased the results. However, independent observations could have also introduced bias if program leaders behaved differently while being observed (eg, more or less adherent to the curriculum).[49] Although self-report assessments may have lower validity, they offer several advantages including cost and time savings.[49] Finally, it is possible that participants who chose to attend the focus group discussions felt more positively about the program. Although no differences in satisfaction ratings were observed among attendees and nonattendees who completed the survey, about one quarter of SHHC participants did not respond to the survey. These nonrespondents had lower attendance rates, which may indicate differential perceptions of the program.

IMPLICATIONS FOR RESEARCH AND PRACTICE

Designing programs that require reasonable time commitments from participants while providing adequate opportunities for skill-based learning and group interaction remains a challenge for health promotion programs. Recommended strategies for ensuring high fidelity and participant satisfaction include involving local health educators as program facilitators and offering face-to-face group classes. Although online or telehealth approaches are often recommended for rural locations, in-person sessions were an effective way to engage SHHC participants. Future process evaluations might compare self-reported fidelity measures with independent observations to foster better understanding and minimize bias. In addition, future multilevel intervention studies might examine how context influences program implementation by including a multilevel process evaluation to capture how the program was operationalized at the social and community levels. Results from the current evaluation have guided improvements to the SHHC program for a second phase of implementation, including tailoring and reordering program components to accommodate participant time constraints and learning needs. Furthermore, these findings will inform the design and implementation of future health promotion interventions for medically underserved, rural populations.

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SUPPLEMENTARY DATA

Supplementary data related to this article can be found at https://doi.org/10.1016/j.jneb.2018.10.011.

REFERENCES

1. Benjamin EJ, Virani SS, Callaway CW, et al. Heart disease and stroke statistics—2018 update: a report from the american heart association. *Circulation*. 2018;137:e67-e492.
2. Cossman JS, James WL, Cosby AG, Cossman RE. Underlying causes of the emerging nonmetropolitan mortality penalty. *Am J Public Health*. 2010;100:1417-1419.

3. Meit M, Knudson A, Gilbert T, et al. *The 2014 Update of the Rural–Urban Chartbook*. Bethesda, MD;2014.
4. ACOG Committee Opinion No. 586. Health disparities in rural women. *Obstet Gynecol*. 2014;123(2 part 1):384-388.
5. Anderson TJ, Saman DM, Lipsky MS, Lutfiyya MN. A cross-sectional study on health differences between rural and non-rural U.S. counties using the County Health Rankings. *BMC Health Serv Res*. 2015;15:441.
6. Trivedi T, Liu J, Probst J, Merchant A, Jones S, Martin AB. Obesity and obesity-related behaviors among rural and urban adults in the USA. *Rural Remote Health*. 2015;15:1-11.
7. Lundeen E, Park S, Pan L, O'Toole T, Matthews K, Blanck H. Obesity prevalence among adults living in metropolitan and nonmetropolitan counties—United States, 2016. *Morb Mortal Wkly Rep*. 2018;67:653-658.
8. Dean W, Johnson C, Sharkey J. Rural food disparities: availability and accessibility of healthy foods. In: Crosby R, Wendel M, Vanderpool R, Casey B, eds. *Rural Populations and Health*, 1st ed., San Francisco, CA: Jossey-Bass; 2012:251-266.
9. Hansen AY, Umstattd Meyer MR, Lenardson JD, Hartley D. Built environments and active living in rural and remote areas: a review of the literature. *Curr Obes Rep*. 2015;4:484-493.
10. Maley M, Warren BS, Devine CM. Perceptions of the environment for eating and exercise in a rural community. *J Nutr Educ Behav*. 2010;42:185-191.
11. Mudd-Martin G, Biddle MJ, Chung ML, et al. Rural appalachian perspectives on heart health: social ecological contexts. *Am J Health Behav*. 2014;38:134-143.
12. Peterson J, Schmer C, Ward-Smith P. Perceptions of midwest rural women related to their physical activity and eating behaviors. *J Community Health Nurs*. 2013;30:72-82.
13. Seguin R, Connor L, Nelson M. Understanding barriers and facilitators to healthy eating and active living in rural communities. *J Nutr Metab*. 2014;2014:23-25.
14. Chrisman M, Nothwehr F, Yang G, Oleson J. Environmental influences on physical activity in rural midwestern adults: a qualitative approach. *Health Promot Pract*. 2014;16:142-148.
15. Seguin RA, Eldridge G, Graham ML, Folta SC, Nelson ME, Strogatz D. *Strong Hearts, Healthy Communities*: a rural community-based cardiovascular disease prevention program. *BMC Public Health*. 2016;16:86.
16. Spring B, Ockene JK, Gidding SS, et al. Better population health through behavior change in adults: a call to action. *Circulation*. 2013;128:2169-2176.
17. Stoddard AM, Palombo R, Troped PJ, Sorensen G, Will JC. Cardiovascular disease risk reduction: the Massachusetts WISEWOMAN project. *J Womens Health*. 2004;13:539-546.
18. Khare MM, Koch A, Zimmermann K, Moehring PA, Geller SE. *Heart Smart for Women*: a community-based lifestyle change intervention to reduce cardiovascular risk in rural women. *J Rural Health*. 2014;30:359-368.
19. Altman R, de Ybarra JN, Villablanca AC. Community-based cardiovascular disease prevention to reduce cardiometabolic risk in Latina women: a pilot program. *J Womens Health*. 2014;23:350-357.
20. Yanek LR, Becker DM, Moy TF, Gittelsohn J, Koffman DM. *Project Joy*: Faith based cardiovascular health promotion for African American women. *Public Health Rep*. 2001;116:68-81.
21. Folta SC, Lichtenstein AH, Seguin RA, Goldberg JP, Kuder JF, Nelson ME. The *StrongWomen-Healthy Hearts* program: reducing cardiovascular disease risk factors in rural sedentary, overweight, and obese midlife and older women. *Am J Public Health*. 2009;99:1271-1277.
22. Moore GF, Audrey S, Barker M, et al. Process evaluation of complex interventions: Medical Research Council guidance. *BMJ*. 2015;350:h1258.
23. Rural Health Information Hub. Rural community health toolkit. https://www.ruralhealthinfo.org/toolkits/rural-toolkit. Accessed August 28, 2018.
24. Saunders RP, Evans MH, Joshi P. Developing a process-evaluation plan for assessing health promotion program implementation: a how-to guide. *Health Promot Pract*. 2005;6:134-147.
25. Lloyd J, Dean S, Creanor S, et al. Intervention fidelity in the definitive cluster randomised controlled trial of the *Healthy Lifestyles Programme* (HeLP) trial: findings from the process evaluation. *Int J Behav Nutr Phys Act*. 2017;14:163.
26. Farquhar SA, Parker EA, Schulz AJ, Israel BA. Application of qualitative methods in program planning for health promotion interventions. *Health Promot Pract*. 2006;7:234-42.
27. Sriram U, Morgan E, Graham M, Folta S, Seguin R. Support and sabotage: a qualitative study of social influences on health behaviors among rural adults. *J Rural Health*. 2017;34:88-97.
28. Lo BK, Morgan EH, Folta SC, et al. Environmental Influences on physical activity among rural adults in Montana, United States: views from built environment audits, resident focus groups, and key informant interviews. *Int J Environ Res Public Health*. 2017;14:E1173.
29. Seguin RA, Economos CD, Nelson ME, Hyatt R, Palombo R, Reed PNT. Design and national dissemination of the *StrongWomen* community strength training program. *Prev Chronic Dis*. 2008;5:A25.
30. Seguin RA, Folta SC, Sehlke M, et al. The *StrongWomen* Change Clubs: engaging residents to catalyze positive change in food and physical activity environments. *J Environ Public Health*. 2014;2014:162403.
31. Glanz K, Rimer B, Viswanath K. *Health Behavior and Health Education: Theory, Research, and Practice*. 5th Edition. San Francisco, CA: Jossey-Bass; 2015.
32. Morgan EH, Graham ML, Folta SC, Seguin RA. A qualitative study of factors related to cardiometabolic risk in rural men. *BMC Public Health*. 2016;16:305.
33. Seguin RA, Paul LC, Folta SC, et al. *Strong Hearts, Healthy Communities*: a community–based randomized trial for rural women. *Obesity (Silver Spring)*. 2018;26:845-853.
34. Health Resources and Services Administration. Medically Underserved Areas and Populations (MUA/Ps). https://bhw.hrsa.gov/shortage-designation/muap. Accessed October 12, 2018.
35. American Fact Finder. American Community Survey, 2012-2016, 5-Year Estimates. (2016) Table S0101. http://factfinder2.census.gov. Accessed November 18, 2018.
36. Centers for Disease Control and Prevention. Policy Map. CDC Behavioral Risk Factor Surveillance System 2013. https://www.policymap.com/. Accessed November 18, 2018.
37. Allen MD. Telephone focus groups: strengths, challenges, and strategies for success. *Qual Soc Work*. 2013;13:571-583.

38. Frazier LM, Miller VA, Horbelt D V, Delmore JE, Miller BE, Paschal AM. Comparison of focus groups on cancer and employment conducted face to face or by telephone. *Qual Health Res*. 2010;20:617-627.
39. Tolhurst H, Dean S. Using teleconferencing to enable general practitioner participation in focus groups. *Prim Heal Care Res Dev*. 2004;5:1-4.
40. Saldaña J. *The Coding Manual for Qualitative Researchers*. Thousand Oaks, CA: SAGE Publications, Inc; 2016.
41. Bopp M, Wilcox S, Hooker SP, et al. Using the RE-AIM framework to evaluate a physical activity intervention in churches. *Prev Chronic Dis*. 2007;4:A87.
42. Rosecrans AM, Gittelsohn J, Ho LS, Harris SB, Naqshbandi M, Sharma S. Process evaluation of a multi-institutional community-based program for diabetes prevention among First Nations. *Health Educ Res*. 2008;23:272-286.
43. Wang HE, Lee M, Hart A, Summers AC, Anderson Steeves E, Gittelsohn J. Process evaluation of *Healthy Bodies, Healthy Souls*: a church-based health intervention program in Baltimore City. *Health Educ Res*. 2013;28:392-404.
44. Folta SC, Seguin RA, Chui KH, et al. National dissemination of *StrongWomen—Healthy Hearts*: a community-based program to reduce risk of cardiovascular disease among midlife and older women. *Am J Public Health*. 2015;105:2578-2585.
45. Ory MG, Lee S, Han G, et al. Effectiveness of a lifestyle intervention on social support, self-efficacy, and physical activity among older adults: evaluation of Texercise Select. *Int J Environ Res Public Health*. 2018;15:E234.
46. Eyler AA. Personal, social, and environmental correlates of physical activity in rural Midwestern white women. *Am J Prev Med*. 2003;25:86-92.
47. Mercer K, Giangregorio L, Schneider E, Chilana P, Li M, Grindrod K. Acceptance of commercially available wearable activity trackers among adults aged over 50 and with chronic illness: a mixed-methods evaluation. *JMIR Mhealth Uhealth*. 2016;4:e7.
48. Cadmus-Bertram LA, Marcus BH, Patterson RE, Parker BA, Morey BL. Randomized trial of a Fitbit-based physical activity intervention for women. *Am J Prev Med*. 2015;49:414-418.
49. Breitenstein SM, Gross D, Garvey C, Hill C, Fogg L, Resnick B. Implementation fidelity in community-based interventions. *Res Nurs Health*. 2010;33:164-173.

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