

Sustaining community choirs for diverse older adults after completion of the Community of Voices trial: A multi-stakeholder, multi-site qualitative study

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Abstract

Background

The growing and increasingly diverse U.S. aging population needs sustainable, evidence-based interventions to maintain health and independence in the community. Through a three-way collaboration between a university research partner, an aging services partner and a community music partner, we developed and tested a senior center-based choir intervention for ethnically diverse older adults that decreased loneliness and increased engagement. We now report on the key factors affecting sustainment, defined by continuation of the choirs after the completion of the trial and ongoing participation of older adults.

Methods

Of the twelve choirs in the study, five were provided with additional funding to sustain the choirs for an additional six months, without technical support from the researchers. During this sustainment period, semi-structured individual and focus group interviews were conducted with key stakeholders (trial participants who continued in the choirs, music professionals, and administrators). We explored facilitators and barriers to continued participation in the choirs and sustainment of the choirs themselves by the senior centers and music professionals. Transcripts were open coded using ATLAS.ti by two researchers not involved in the original CRT, followed by axial coding by a third researcher. Differences were reconciled by discussion.

Results

Salient themes emerged at all levels. Intrapersonal: a sense of well-being and positive emotion facilitated choir participation, and sustainment of the choirs, but major health issues and negative emotions led trial participants to discontinue the choirs at the end of the trial. Interpersonal: a sense of social connection and support facilitated sustainment, but negative social interactions and competing obligations, particularly participants' family responsibilities, created barriers. Structural/organizational: organizational features such as comfortable rehearsal space or clear scheduling, facilitated sustainment, but structural issues with parking and transportation created barriers. Administrators emphasized funding as crucial to sustainment. To date, all of the choirs from the original CRT have been sustained and the community partners are actively disseminating the intervention outside of the research setting.

Conclusions

Senior center-based choirs are readily sustainable. A conceptual model is provided to guide the implementation of future choirs and other community-based social interventions.

Trial registration:

The original trial was registered under ClinicalTrials.gov. NCT01869179. Registered 9 January 2013, <https://clinicaltrials.gov/ct2/show/NCT01869179>

Background

The older population in the United States (U.S.) is both increasing and becoming more diverse (1, 2). To improve the physical, cognitive, and emotional well-being of adults age 60 and over, we need to identify cost-effective and sustainable community-based programs that promote health and well-being. In particular, evidence-based behavioral interventions that can be easily implemented by community-based organizations serving diverse older adults could help them maintain their health, independence and functioning as they age, and extend the time they live in their homes and communities.

For low-resource and culturally diverse community settings, issues of acceptability, practicability and scalability are of special concern in considering which behavioral interventions to adopt or implement. Complex contextual factors, such as cultural factors, social networks, agency interactions, community settings, and limited economic resources influence the implementation of programs designed to improve health. Implementation science often uses both qualitative and quantitative methods to gain insights into these issues, especially when the programs being considered are multi-component and involve multiple community sites and health disparities populations (3, 4).

Once a behavioral intervention has been found to be effective in an efficacy study, the next steps involve sustainment of the programs and adoption by other communities/organizations in order to reach a broader audience. The logical next step is to attempt to sustain an intervention immediately after it has been tested in the settings in which it was initially established. Such a sustainment effort takes advantage of the fact that these organizations already have the infrastructure to deliver the intervention, with systems in place to deliver it and recruit participants.

This paper reports on the key facilitators and barriers to sustainment of an intervention immediately following the completion of a cluster-randomized trial (CRT) of a one-year community choir intervention for older adults from diverse racial/ethnic and socioeconomic backgrounds (5). The intervention was offered in 12 senior centers, and we tested its effects on health and well-being (6). At the end of this CRT, additional funding was obtained to continue (sustain) a subset of the choirs for six more months and examine facilitators and barriers to sustainment.

In this paper, we explore factors affecting sustainment of these five choirs by interviewing three types of stakeholders at the end of the "sustained" six-month time period: music professionals who directed the choirs, administrators overseeing the senior centers and music organization and trial participants who continued in the choirs during the sustainment period. We conducted a series of semi-structured interviews and focus groups to address three overarching research questions. 1) What facilitators were involved in sustaining the choir intervention in the senior centers after completion of the trial? 2) What barriers were

experienced in sustaining the choir intervention in the senior centers? 3) Did these facilitators and barriers affect sustainment on intrapersonal, interpersonal and/or organizational/structural levels?

Methods

Parent Study: The Community of Voices Trial

Through a partnership between the University of California, San Francisco, the San Francisco Community Music Center, and the San Francisco Department of Disability and Aging Services, including twelve Area on Aging-supported senior centers, we conducted a CRT to examine the effects of a community choir intervention on the health and well-being of older adults (age 60 and over) from diverse racial/ethnic and socioeconomic backgrounds. Using community-engaged research methods, the Community of Voices (COV) trial (6–8) randomized 12 senior centers to receive the choir intervention either immediately (n = 208) or after a six-month delay (n = 182). The community choir intervention was designed to target cognitive, physical and psychosocial engagement components in 90-minute sessions delivered weekly by community-based music professionals (5). In comparison to waitlist controls, the immediate-start participants had statistically significant reductions in loneliness and increased interest in life, but not in cognitive or physical function after six months, which was the main randomized comparison (6). In an accompanying qualitative assessment of perceived benefits, trial participants overwhelmingly reported improvements in emotional well-being that they identified as related to decreases in loneliness and the view that participation in the choir brought joy to their lives (9).

Ancillary Study: Sustaining community choirs after completing the parent study

Sustainment definitions

As per Berta and colleagues, we restrict the definition of sustainment to the continuation of the processes and practices of the intervention (10), in this case including both sustainment of the choirs themselves and continued participation in the choir by study participants. We received supplemental funding to continue the first five of the 12 choirs that completed the 12-month COV trial. Financial assistance was provided to the five senior centers to enable them to continue (sustain) the choirs for an additional six months, which we refer to as the sustainment period. During the sustainment period, the community music partner coordinated the choir program, collaborating with the senior centers to manage the choirs, and the research team no longer provided technical support or protocol oversight. During this time, trial participants from the first five sites to complete the COV intervention were given the opportunity to continue in the choirs during the sustainment period. During sustainment, the choirs were also opened to new participants.

Sample and Recruitment

We recruited four types of stakeholders from the five sites in the ancillary study: (i) music professionals who continued to deliver the choir intervention, (ii) administrators at both the senior centers and the music organization, (iii) choir participants who had completed the original one-year CRT (called “trial participants” in this paper) and continued the choir during the sustainment period, and (iv) choir participants who completed the original CRT and elected not to continue during the sustainment phase, that is, after the original CRT ended.

The music professionals, choir directors and accompanists, who led the choirs at each of the five sites (N = 6) and the administrators at the five senior center sites and the music center (N = 6) were invited to participate in individual interviews following the six-month sustainment period.

At the final 12-month assessment at the conclusion of the COV trial, we asked trial participants if they planned to continue participating in the choir; and if so, if they would consent to participate in a focus group (English or Spanish) at the end of the six-month sustainment period. If trial participants decided not to continue in the choir during the sustainment period, they were invited to participate in a phone interview within one month. Study procedures were explained in person. A new consent form was signed by all participants who agreed to enroll in the ancillary study. The UCSF Institutional Review Board approved this ancillary study.

Interview and Focus Group Questions and Procedures

Music Professionals and Administrators

Music professionals were asked about facilitators and barriers to continuing to conduct and provide musical accompaniment for the senior center choirs. Music professionals were also asked both general and music-specific questions about how the sustainment choirs differed from the trial intervention. Administrators were asked general questions about how the sustainment choirs differed from the trial itself, and about facilitators and barriers to continuing the choir program. Semi-structured interviews with music professionals and administrators were designed to last about 60 minutes and to be conducted either at the senior centers, the music center, or another music studio. Experienced interviewers completed the semi-structured interviews, and the interviews with music professionals were conducted by an interviewer with expertise in music anthropology. Interviewers recorded self-reported sex and race/ethnicity of all participants.

Participants

Interviews with trial participants who continued the choir intervention were conducted via focus groups at the end of the six-month sustainment period. These participants were asked general questions about the sustained choirs, how the sustained choirs differed from the trial choirs and what they perceived as facilitators and barriers to their continued involvement in the choir program. Interview guides for Spanish-speaking trial participants were translated into Spanish by bilingual-bicultural research staff using team reconciliation for the final version. Focus groups were designed to last about 90 minutes and were conducted at the senior centers hosting the choirs; 2 focus groups were conducted in Spanish and 3

in English. Focus groups were conducted by experienced facilitators; bilingual-bicultural facilitators conducted the Spanish-language focus group.

Trial participants who elected not participate in the sustainment choirs but agreed to an interview were asked for information about the facilitators and barriers to continuing with the choir intervention, including their reasons for discontinuing the choir. Interviews were designed to last 15–30 minutes and were conducted by telephone.

All ancillary study participants completed a brief survey of demographic characteristics including: sex, age, race/ethnicity, Spanish language (yes/no), foreign born (yes/no), and country of origin.

Data Analysis

Focus groups, in-person interviews and telephone interviews were audio recorded, professionally transcribed in the original language, and checked for accuracy. Transcripts in Spanish were translated into English and checked for accuracy by bilingual/bicultural members of the research team. We used an inductive approach to content analysis (11, 12), using ATLAS.ti analytical software. In order to minimize bias, open coding was conducted by two researchers, a PhD medical sociologist and a PhD psychologist, who were not involved in the original COV trial. Open codes were developed to identify specific barriers and facilitators to sustainment. For example, the facilitator code “choir director involvement” was tagged to each statement that identified choir director activities as key facilitators. Each coder independently read and coded the transcripts and identified themes through the process of axial coding, making connections among codes and writing analytical memos (11, 13). A third researcher, an MD geriatrician/PhD music anthropologist, independently read all of the transcripts and engaged in further axial coding, a process common to both grounded theory and ethnographic analysis (11, 14), until thematic saturation was reached (no new themes were identified) and an overarching thematic conceptual model emerged. For example, the open code “choir director involvement” was merged into the overarching theme of “social connection” as an interpersonal facilitator. Throughout the analysis, input was solicited from the senior researchers and differences were reconciled through discussion.

Results

Participants

Of 94 participants who completed the trial (12-month assessment) at the five sites, 31 opted to continue singing and participate in a focus group at their site. Of the 48 participants who completed the trial but chose not to continue singing, 14 agreed to be interviewed by phone within one month. All five of the music professionals who delivered the choir intervention were interviewed, as were all five senior center administrators and the music organization administrator. Table 1 summarizes the demographic characteristics of each stakeholder group.

Conceptual framework

A conceptual framework for sustainment emerged, reflecting themes at the intrapersonal, the intrapersonal, and the organizational levels that served as facilitators or barriers to sustainment. These themes are grouped and presented by two broad categories of facilitators and barriers, with subgroupings within each of these by level.

[place figure 1 near here]

Facilitators

Facilitators were associated with both ongoing individual participation in the choir during the sustainment phase as well as sustainment of the choirs themselves within the senior centers. See Table 2 for example quotes [note: minor details have been changed to preserve anonymity].

Intrapersonal Level

Emotional wellbeing and positive emotions were identified as key facilitators to continuation by both the trial participants who continued and those who discontinued following the CRT, and this was observed by the music professionals and the administrators. One trial participant explained why she had wanted to continue participation in the choir by saying, “the act of being in the choir, music feeds the soul as they say, but aside from that, it relaxes you. And aside from that, it transports you to wonderful memories. It makes you happy.” Positive emotions included overall enjoyment of the choir and with singing, a strong sense of wellbeing, and enjoyment of specific aspects of participation such as visibility, connections with the past, and the enjoyment of learning and physical exercises.

Interpersonal/Relationship Level

Social connection, belonging and social support were emphasized as facilitators in all of the trial participant focus groups. As one trial participant explained, “I think it’s that sense of belonging to a larger group. They’ve made friendships, again. It makes them feel empowered. They feel active, you know, they have a sense of belonging... and so they come, they’re anxious to come together to practice, to share and now they’ve become friends.” The emergence of friendships within the choirs was observed by both music professionals and administrators alike.

In addition to relationships among trial participants, relationships developed between the trial participants and music professionals. Trial participants described deep admiration for the music professionals through descriptions like the following: “and with great teachers, because we have very good teachers, they direct

us well, they explain each thing to us, if we're doing well, if we're not getting the tone. They always are careful that we bring out our voice and I just love that." The music professional similarly highlighted the importance of the relationship between trial participants and their director. "What I've seen in the choirs in general, is that that relationship between choir director and participant and the creation of a social fabric within the group is very important. Because that sense of community is part of what helps people to stay connected. So, it's not an isolated activity. In fact, it brings people together. And that's what helps make it fun and helps people to continue." Strong relationships between the senior center directors and the music center director, were also identified as key facilitators to sustainment.

Organizational/Structural Level

Organization factors related to the structure, format and programming of the choirs emerged as a primary facilitator of choir sustainment. The "professionalism" of the choir directors and accompanists [music professionals] was singled out as a critical factor, including one administrator's observation that the music professionals were "very patient, but also very clear and firm. And I think the people follow their lead. I think you have to have that in order to produce results." This included both the technical aspects of leading a rehearsal and the overall organizational skills needed to prepare the group for choir performances. As one trial participant explained, "The schedule that the teachers gave us were extremely well organized, very well done. It had the whole year, with the vacations, when we were out, when we would go in."

Beyond scheduling, organization skills at the level of the choir involved sophisticated musical and pedagogical aspects of choir direction. The music professionals spoke in detail about ways in which the quality of the music led trial participants to continue during the sustainment period, and of the need to create new arrangements appropriate to the vocal ranges of older adults. Reflecting on the refinement of the choir in the sustainment phase, one music professional observed that "the curriculum of the choir sessions got stronger, with a more codified approach to customizing these choir sessions, which really came out of a community development model or a community arts model, to be even more customized towards older adults." The music professional noted that the sustainment period provided a time in which key stakeholders "learned more about how to deliver a choir program specifically for older adults."

Organizational involvement emerged as an understated but critical aspect of sustainment. The involvement in and support of senior center personnel related to the choir program were viewed as essential for success over time. Without the willingness of the senior center to schedule, reserve rooms and provide space for rehearsals, the choirs could not have continued after completion of the trial. Strong senior center involvement, however, did more than make sustainment possible, it ensured the success of the program. As one music professional explained, "When the centers took over, they [the senior center

administrators]pretty much nursed us through the transition because we didn't have to worry about the room, they would help set it up, and it was a big choir.”

The music professionals and administrators also described the importance of strong and supportive relationships at the organizational level. One administrator acknowledged this saying, “I think that one nice thing that we see is, the choir members do feel an affection for the senior center. They appreciate the environment.” One administrator explained that organizational-level relationships are important “because one organization cannot do it by themselves. It takes a couple of organizations getting together to make sure that these things happen, so we all put a little piece in the pot, and it works. I love it.” These multiple and overlapping relationships were found to be essential in the sustainment of the choirs.

Barriers

Unlike the facilitators, which the stakeholders identified as critical for sustainment of the choirs, none of the barriers were associated with discontinuation of the choirs. Barriers listed below were either identified as causing difficulties with attendance, or with the discontinuation of a specific trial participant. See Table 3 for example quotes [note: minor details have been changed to preserve anonymity].

Intrapersonal Level

Health issues were identified as a primary reason for trial participants to attend less frequently in the choirs or to drop out entirely during the sustainment phase. These included serious life events such as cancer, chronic illness management requiring regular medical appointments, and intercurrent illnesses (see reasons for discontinuation below). The impact of cold and flu season on attendance was described by an administrator who observed that, “by the holidays it [attendance] has kind of drizzled down a little bit, and then like I said, the weather, and you know, them being a little under the weather.”

Interpersonal Level

Negative social interactions were described in the focus groups and interviews, although with less frequency than the positive interactions listed above. During choir rehearsals, there were isolated complaints of interruptions of these sessions by specific trial participants. One trial participant felt that there were insufficient opportunities for social interaction. When new members were allowed to join the choirs after the trial ended and the sustainment period began, several trial participants expressed frustration with the singing abilities of the newcomers. For one choir, a music professional initially reported that “at least the group... absorbed the newcomers,” but then qualified the statement, noting that there “was a bit of friction with the newer people that did stay, when it opened up to community groups.”

Competing family obligations were frequently cited as a reason for discontinuing the choir or as barriers to attending rehearsals. When one trial participant observed that “a few of our seniors, they had still caregiving positions, or taking care of grandbabies,” another trial participant chimed in with “taking care of grandbabies,” following which the first speaker continued, “great grandbabies – great-great-grandbabies.” Trial participants described in detail the need to help adult children as well as the next generations, prioritizing familial relationships over those created through participation in the choir, while expressing regret that the familial relationships interfered with choir participation.

Organizational/Structural Level

Transportation/Access issues. As might be expected in an urban environment, a primary structural barrier involved travel to the senior center. Some trial participants struggled to navigate public transportation. One participant explained his complex situation as follows: “I don’t have easy access to a car, even though I have one. My daughter has a nanny, and she gets the car. And I could easily call a cab.... But I just hate spending money when I don’t really have to. So, if I can walk someplace, it’s great. But, at night, in the dark, in the wintertime, I don’t want to be walking alone in the street, to and from the bus stop.” Stakeholders specifically identified limited parking as barriers to timely arrival for rehearsal, summed up most succinctly by a music professional as “The parking, just the parking.”

Choir rehearsal and schedule issues. Issues related to choir rehearsal organization and scheduling sometimes undermined relationships and created barriers to participation. Several trial participants raised concerns about scheduling and communication issues. One of the music professionals noted that scheduling and communicating with the senior centers was complicated by the transition from a university to a community partner coordinator after the trial ended. As this transition was taking place, one music professional noted the critical nature of this position in sustainment “Easier would be to have definitely a coordinator, someone that’s not a director, not an accompanist... Otherwise it’s just – it’s too much for one or two persons to do.” (Music professional). Another music professional noted that, once the trial was over, the choirs began to receive local invitations to perform. These invitations were accepted, but the performances led to schedule changes on short notice. Additionally, some trial participants identified the change in rehearsal time as a critical obstacle to continuation and others disliked a summer break, which was added to conform to the long-standing schedule at the music center. Communication issues between the music and senior center organizations created minor friction, but were reported rarely.

Senior Center environment issues included both modifiable and unmodifiable barriers. The clearest example of ongoing attempts to reduce modifiable barriers was presented by a music professional who described issues of noise that were ameliorated but not entirely fixed by a change in seating arrangements during the sustainment phase: “So everything – that has all improved in the extension. Now if we could just get rid of the fans, things would be really great. Super loud fans.” In contrast to seating arrangements, which were altered in several locations, the size and availability of the rooms were not modifiable. In one case, the move to a smaller room caused frustration for several trial participants, and led another trial participant to discontinue because the room had been used for a family member’s memorial service.

Issues due to transition of choir management from academic to senior center. Although the transition was overwhelmingly described as positive by trial participants, both the music professionals and the administrators identified barriers to sustainment associated with this change in management. In one case a music professional identified that one senior center had “a very difficult time at having choir retention [i.e. attendance and recruitment] in general. I don’t know why.” Another music professional described a specific transitional issue, the need for water (which had been provided during the trial by the research staff) during the social break in the middle of the rehearsals. The music professional said that initially, “I felt the pulling away of the support of UCSF around the food,” but that, ultimately the issue was resolved through support of the senior center.

Funding. In contrast to music professionals and trial participants, all administrators identified funding as the critical factor underpinning sustainment of the choirs or any other community-based program. One administrator said, “what happens over and over again, I mean, time and time again, is that there’s funding that comes down for programs that are good concepts. People get behind them, they organize them and all that and they’re great for a while, and then the funding dries up. And then, there’s no more programs.” Every administrator expressed the desire to support the choirs but noted that they would require additional funding in order to do so. As one summarized, “It all comes down to resources, because we have the framework.”

Reasons for discontinuing after the end of the trial. All reasons for discontinuation are included here, whether or not they reached the level of thematic saturation. Among participants who completed the trial and then elected not to continue during the sustainment phase, the reasons for not continuing fell into three major categories: serious illness, competing caregiving responsibilities, and disliking singing in the choir. Several trial participants reported more than one primary reason for discontinuation. Nearly two thirds of the telephone-interviewed trial participants noted that they had enjoyed the choir and wanted to continue but were unable to continue during the sustainment phase due to health issues or familial

responsibilities. One third cited health issues including cancer, surgery, acute infection, chronic “dizziness,” worsening hearing loss, arthritis, and acute bereavement issues. One third cited external family and caregiving relationships, such as moving out of the area to live closer to adult children, and providing direct care to young children in the family. One third cited reasons involving the choir intervention itself. These included preferring to sing alone, finding the singing to be “stressful,” disliking unexpected changes in scheduling, feeling frustrated when a music professional arrived late, and disliking the music selections.

Discussion

This study examined facilitators and barriers to sustainment by the community music and senior center partners without the technical assistance of the research team after completing the large community-based CRT. We identified three salient themes including (1) emotional engagement and personal health at the intrapersonal level, (2) the quality of social relationships and social connectedness at the intrapersonal level, and (3) scheduling, communication between organizations, parking and accessibility at the organizational/structural level. Reasons for discontinuation were consistent with the themes. Funding was also critical to sustainment. Varying aspects of these themes served as facilitators and barriers of continued participation in the choirs during the sustainment phase.

On the intrapersonal level, sustainment of the program was clearly facilitated by the deep sense of emotional well-being felt by the trial participants, and positive emotions felt by all stakeholders towards the choir. These facilitators support the results of the main trial, suggesting that the choirs are successful not only for decreasing feeling of loneliness, but by engaging participants on an emotional level. At the individual level, trial participants who discontinued choir participation, did so primarily because of significant health issues or familial responsibilities.

On the interpersonal level, all stakeholder groups identified relationships as essential to the success or failure of choir sustainment. These findings are consistent with studies of other choirs that found that social relationships (15) and social connections (16) were key to the continued engagement of participants. Our findings expand on this work by moving beyond the relationships between trial participants or between trial participants and music professionals, to examine the critical nature of relationships between the music professionals leading the choirs and the senior center administrators who provide the infrastructure to house the choirs. When these relationships are supportive and appreciated, the choirs are sustained. Notable was the issue of competing relationships as barrier, such as caregiving for grandchildren or other family care responsibilities. This finding is new in the literature on choirs for older adults.

On the organizational/structural level, administrator appreciation of and commitment to the choirs served as a powerful facilitator. These findings are consistent with another study that found that management support was essential to sustainment of new community-based behavioral interventions (17). Funding was identified as the rate-limiting step for sustainment by all five senior center administrators because

their intent was to continue the choirs indefinitely, while the administrative supplement only provided six months of funding support. Structural barriers involving travel and parking were reported as affecting attendance, but were not cited as a reason for discontinuing participation unless a participant moved entirely out of the area. Issues of scheduling and communication, functioned as facilitators when the stakeholders felt expectations were clear, and as barriers when trial participants felt they received inadequate preparation for cancelled rehearsals.

Although the overall successful sustainment of all of the choirs suggests that the barriers were outweighed by the facilitators, this sustainment study has some limitations. The study is qualitative. All five choirs that were supported by research funding for sustainment continued for the full six months, but assessment over a longer timeframe would strengthen the findings.

Since completion of the CRT, all twelve choirs have been successfully sustained and the intervention has been disseminated to two new senior centers (18). In addition, the music partner is piloting two Cantonese language choirs in collaboration with affordable senior housing sites. The choirs continue to rehearse and perform regularly, without involvement of the research personnel and with support from a variety of funding mechanisms.

Conclusions

This qualitative study provides insight into the facilitators and barriers to sustainment of a successful, community-based choir program for older adults. In the case of choirs for older adults of diverse backgrounds, the marked sense of well-being and positive emotion, coupled with a strong sense of social connection and social support, suggest that these programs are sustainable in existing senior centers when funding can be found. The emotional well-being and positive relationships facilitate participation in the choirs, but this is only one aspect of sustainment. The other is the sustainment of the choirs themselves, which requires music professional involvement, administrative expertise, funding and space. By bringing together two types of established community organizations that do not usually collaborate, senior centers and music organizations, the trial served to create a lasting partnership that underpins the sustainment and expansion of the program. The conceptual model of facilitators and barriers to sustainment can serve as a guide for the development and sustainment of future arts interventions in community settings.

List Of Abbreviations

Community of Voices (COV)

Cluster-randomized trial (CRT)

Declarations

Ethics approval and consent to participate: Approval to conduct the study was gained from the University of California, San Francisco Institutional Review Board, and consent was obtained in writing from all participants

Consent for publication: Not applicable.

Availability of data and materials: The dataset (which includes individual transcripts) is not publicly available due to confidentiality policies. De-identified data is available from the corresponding author on reasonable request.

Competing interests: The authors have no conflict of interest to disclose

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Disclaimer. The contents and views in this manuscript are those of the authors and should not be construed to represent the views of the National Institutes of Health.

Tables

Table 1. Participant characteristics

Participant Group	Trial participants who continued during sustainment (n=31)	Trial participants who discontinued during sustainment (n=14)	Administrators at senior centers and community musiccenter (n=6)	Music professionals (choir directors, accompanists) (n=6)
Age (mean, SD)	74.5 (7.5)	70.8 (6.5)	NA	NA
Sex (female/male)	21/10	11/3	6/0	4/2
Race/Ethnicity*				
Non-Latino	4	4	2	2
White	9	3	20	1
Non-Latino	3	0	2	2
Black	15	7		1
Asian /Pacific Islander				
Latino				
High school (including GED)	7	5	NA	NA
or less				
Married or partnered	11	3	NA	NA
Completed interview in Spanish, n	11	7		

*20 participants self-identified as foreign-born. Countries of origin included: China (n=1); Cuba (1), Denmark (1), El Salvador (2), Guatemala (3), Mexico (7), Philippines (3), Spain (2)

Table 2. Facilitators to sustaining a choir intervention identified by trial participants who continued after the original CRT, administrators, and music professionals

INTRAPERSONAL LEVEL

Theme	Core Features	Illustrative Quotes
Emotional well-being, positive emotions	<ul style="list-style-type: none"> · Enjoy singing, attention, connections with past through music, learning, physical exercises; improved emotional well-being, less stress; health benefits (e.g., improved physical health, cognition) 	<ul style="list-style-type: none"> · “it’s important for our seniors, our participants, to have a forum, somewhere they can sing. You know, because it gladdens their heart, you know, make them feel better. It makes them feel like they’re doing something that’s good and that they can look forward to doing, you know, every day.” (trial participant) · “Well, the fact that the choir members feel good about it helps us feel good here. And I’m sure that it makes the Community Music Center feel good too. So, I think that on both sides of the partnership, we know we have happy people, which is how you know you’re having some success.” (administrator)

INTERPERSONAL LEVEL

Social connection, belonging, social support	<ul style="list-style-type: none"> · Enjoy new social connections · Feel part of a group, ownership · Enjoy professional connections with music professionals, music center director and senior center directors · Enjoying relationship with music professionals 	<ul style="list-style-type: none"> · “Because we are extended [sustained] and because we have melded and joined, we feed off of each other and we have become cohesive and friends and this is very positive.” (trial participant) · “It was kind of amazing to us how that group evolved and then became this totally different feeling and this really kind of intimate, supportive feeling. So that was a neat kind of evolution.” (music professional) · “What I did see was the core group, the people that came the most consistently, they took ownership. They started gathering each other's phone numbers. If there was anything that happened - if, for instance, one of the members' siblings had passed or got sick, one or two members would get a card and have everyone sign it, collect the love offering. After the research study, they felt comfortable to do that.” (music professional) · “I think it’s that sense of belonging to, to a larger group, they’ve made friendships, again, it makes them feel empowered, they feel active, you know, they have a sense of belonging.” (administrator)
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ORGANIZATIONAL/STRUCTURAL

INTRAPERSONAL LEVEL

Theme	Core Features	Illustrative Quotes
Senior center involvement and structure	<ul style="list-style-type: none"> · Appreciate strong senior center involvement · Appreciate open door participation policy · Like snack break · Availability of funding · Convenient schedule · Strong working relationship between community partners 	<ul style="list-style-type: none"> · “Wethank [the senior center] for giving us some, some snacks,food, something. [The senior center] supports us. So,we're very happy with that” (trial participant) · “Ithink that one nice thing that we see is, the choir members do feelan affection for the senior center. They appreciate theenvironment.” (administrator) · “I believe we [music professionals and senior centers] have a goodrelationship. We’re in constant communication. If they need me todo something, our staff to do something, as far as getting thechoir out in the community, and scheduling rides. Just being incontact with each other. I believe the relationship is good.”(administrator)
Choir director, organization and structure	<ul style="list-style-type: none"> · Choir director’s effective management · Appreciate organization of rehearsals · Appreciate choir’s summer break 	<ul style="list-style-type: none"> · “And with great teachers, because we have very good teachers, theydirect us well, they explain each thing to us, if we’re doing well,if we're not getting the tone. They always are careful that webring out our voice and I just love that.” (trialparticipant) · “I think that that knowledge of teaching them [the students] how touse your voice and what happens here and there and everythingmostly empowers them to say. ‘I'm not only a person who goes andsings in a choir. I'm a singer.’” (music professional) · “Ineed the summer break because I have a medical emergency and thatmeans I drop out during the whole season if I don’t have the summerbreak. The summer break allows me to do something personal.” (trialparticipant)

Table 3. Barriers to sustaining a choir intervention identified by trial participants who discontinued after the original CRT, administrators, and music professionals

INTRAPERSONAL LEVEL

Theme	Core Features	Illustrative Quotes
Health issues	<ul style="list-style-type: none"> · Poor health · Frequent medical appointments 	<ul style="list-style-type: none"> · “When you're dealing with seniors you're dealing with doctors' appointments all throughout the week. You're dealing with arthritis. You're dealing with various cornucopia of illnesses and things.” (trial participant)

INTERPERSONAL LEVEL

Negative social interactions	<ul style="list-style-type: none"> · Negative social interactions · Feeling lack of group cohesion or commitment 	<ul style="list-style-type: none"> · “There are always new people that don't know the songs and there are always people that were at the choir and that for x or y reason they leave.” (trial participant) · “Liked it better when we didn't have people dropping in and out whenever they felt like it.” (trial participant)
Familial obligations	<ul style="list-style-type: none"> · Caregiving responsibilities · Family obligations 	<ul style="list-style-type: none"> · “My niece had just arrived from El Salvador and I had to go with her to look for housing... then a friend from the church I go to got sick and didn't have anyone to look after her.” (trial participant) · “People travel, have family commitments. They're adults. It's hard.” (administrator)

ORGANIZATIONAL/STRUCTURAL LEVEL

Transportation and access	<ul style="list-style-type: none"> · Difficulty with transportation and parking 	<ul style="list-style-type: none"> · “I used to come on two buses.... I would be traveling like for two hours to get here.” (music professional) · “I noticed that we lost a few people at [the senior center] because of paratransit. They'd never come on time. (music professional)
Choir rehearsal and schedule	<ul style="list-style-type: none"> · Unclear communication during transitions · Rehearsal schedule issues · Found the summer break disruptive 	<ul style="list-style-type: none"> · “I don't know what the schedule is. I wanted to call someone and say ‘When's the next rehearsal or when's the next performance?’ I have nobody to call.” (trial participant) · “Unfortunately, the schedule didn't suit me very well because sometimes I had my appointments.” (trial participant referring to medical management of chronic illnesses) · “[re: summer break] It breaks the continuity for people who are stuck in town for the summer.” (music professional)

INTRAPERSONAL LEVEL

Theme	Core Features	Illustrative Quotes
Space and communication	<ul style="list-style-type: none"> · Inadequate rehearsal space (noisy, small) · Inadequate coordination, communication 	<ul style="list-style-type: none"> · “Wetried to accommodate a choir performance here a couple of times,and we just can't fit the size of our choir into our space.”(administrator) · “In one senior center case, there was a last-minute cancellation,and the communication was not executed well. So, we had to reallyhave a conversation and a way to ensure that that wouldn’t happenagain.” (music professional)
Transition of choir from academic to senior center	<ul style="list-style-type: none"> · Feelings that partnership was unequal · Changes in rehearsal structure 	<ul style="list-style-type: none"> · “Ithink that the choir is really great. I would just want a littlemore control over things next time out. I mean, we're hosting...we're called a partner, but we really haven't been much of a partner.” (administrator) · [onchanging the snack break]: “Andeverybody just had different feelings. Like, some people wanted to do it, some people didn't, and then some people were intimidated.”(music professional)
Funding	<ul style="list-style-type: none"> · Funding is challenging but critical 	<ul style="list-style-type: none"> · “Believeit or not, activities and senior center things are not as easy towrite grants for, in the foundation world.”(administrator)

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Figures

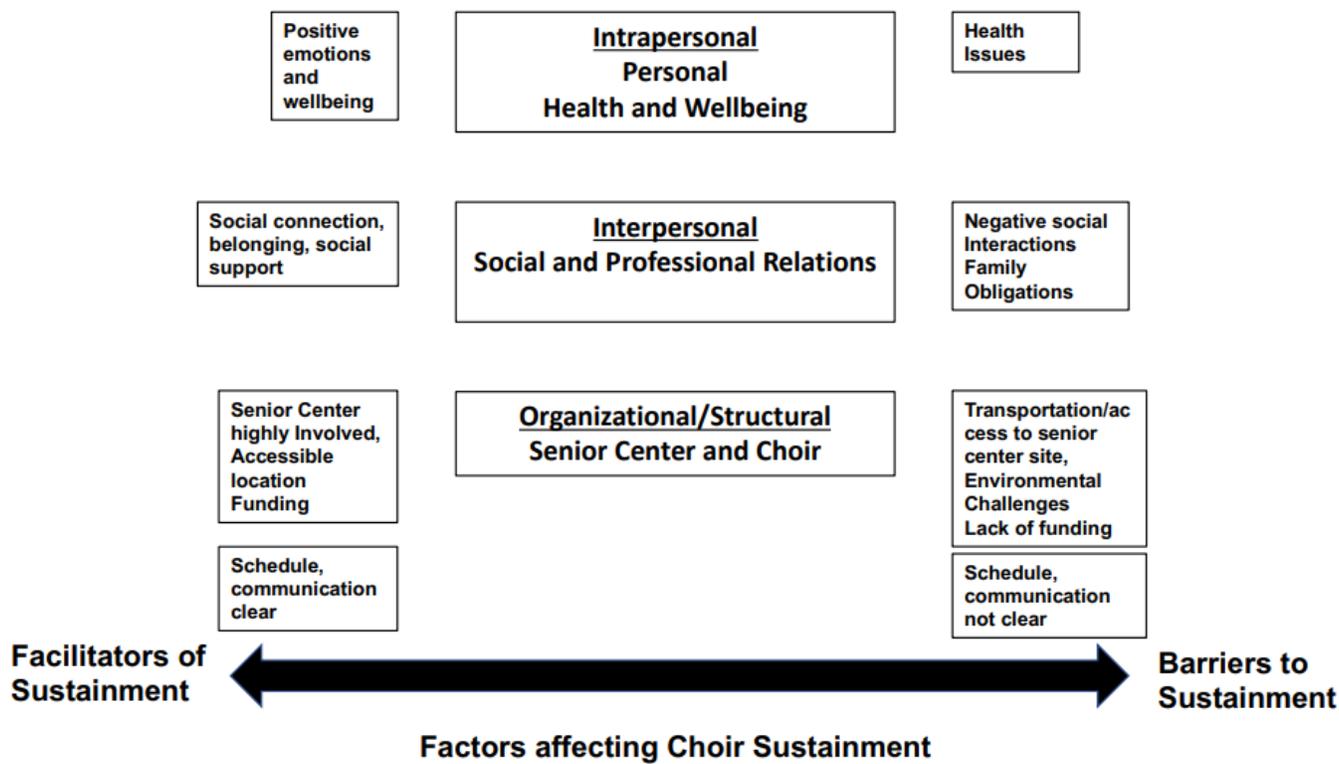


Figure 1

Multi-level framework of factors affecting choir sustainment

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