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Beyond efficacy: A qualitative organizational perspective on key implementation science constructs important to physical activity intervention translation to rural community cancer care sites

Laura Q. Rogers¹, Latoya Goncalves¹, Michelle Y. Martin², Maria Pisu¹, Tamika L. Smith¹, Danielle Hessong¹, Robert A. Oster¹, Haiyan Qu¹, Richard Shewchuk¹, Fatima Iqbal¹, Mary E. Sheffield³, Alex Minter³, Ana A. Baumann⁴

¹University of Alabama at Birmingham

²University of Tennessee Health Science Center

³Russell Medical

⁴Washington University in St. Louis

Abstract

Purpose—Identify constructs relevant to implementation of evidence-based physical activity (PA) behavior change interventions for rural women cancer survivors from an organizational perspective.

Methods—During the development of a PA intervention implementation toolkit, 11 potential interventionists and 19 community and organizational stakeholders completed focus groups stratified by role. Narratives were audio recorded, transcribed, and coded for Consolidated Framework for Implementation Research (CFIR) constructs.

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Corresponding Author: Laura Q. Rogers, MD, MPH, School of Medicine, Division of Preventive Medicine, University of Alabama at Birmingham, 1720 2nd Ave S, MT 614, Birmingham, AL 35294-4410, Telephone number: 205-934-9735, rogersl@uab.edu, Fax: 205-934-7959.

Latoya Goncalves, MPH, University of Alabama at Birmingham, 1675 University Blvd, Birmingham, AL 35294, Michelle Y. Martin, PhD, University of Tennessee Health Science Center, Department of Preventive Medicine and Center for Innovation in Health Equity Research, 910 Madison Avenue, Memphis, TN 38163, Maria Pisu, PhD, University of Alabama at Birmingham, 1720 2nd Ave S, MT 636, Birmingham 35294-4410, Tamika L. Smith, PhD, University of Alabama at Birmingham, 1675 University Blvd, Birmingham, AL 35294, Danielle Hessong, MPH, University of Alabama at Birmingham, 1675 University Blvd, Birmingham, AL 35294, Robert A. Oster, PhD, University of Alabama at Birmingham, 1720 2nd Ave S, MT 642, Birmingham 35294-4410, Haiyan Qu, PhD, University of Alabama at Birmingham, 1716 9th Ave S, Birmingham, AL 35294, Richard M. Shewchuk, PhD, University of Alabama at Birmingham, 1716 9th Ave S, Birmingham, AL 35294, Fatima Iqbal, MPH, University of Alabama at Birmingham, 1675 University Blvd, Birmingham, AL 35294, Mary E. Sheffield, MD, Russell Medical Center, 3316 US-280, Alexander City, AL 35010, Alex Minter, MD, Russell Medical Center, 3316 US-280, Alexander City, AL 35010, Ana A. Baumann, PhD, Washington University in St. Louis, 1 Brookings Dr., St. Louis, MO 63130

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Compliance with Ethical Standards:

Ethical approval: All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed consent: Informed consent was obtained from all individual participants included in the study.

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Results—Multiple CFIR constructs were identified: *Implementation Process* (i.e., *Engaging, Reflecting and Evaluating*), *Intervention Characteristics* (i.e., *Design Quality and Packaging, Cost, Evidence Strength and Quality, Adaptability, Complexity*), *Inner Setting* (i.e., *Implementation Readiness, Implementation Climate, Structural Characteristics*), *Outer Setting* (i.e., *Patient Needs and Resources, Cosmopolitanism*), and *Characteristics of Individuals* (i.e., *Knowledge and Beliefs, Stage of Change*). Narratives identified rural implementation barriers (e.g., transportation) and facilitators (e.g., community-oriented). Unique needs of the cancer survivor (e.g., coping during cancer treatment and long term effects on physical abilities) were emphasized as important barriers potentially addressed through *Adaptability* and *Readiness* implementation strategies. Narratives identified multi-level (i.e., individual-, organizational-, and community-level) strategies for targeting the identified constructs.

Conclusions—Fourteen CFIR constructs emerged as potentially important for organizations to consider when implementing PA interventions. Constructs were integrated into our implementation toolkit and research testing their potential mechanisms of action when implementing PA interventions in rural settings is warranted.

Implications—Strategies that target the identified constructs may enhance the implementation of PA programs for rural cancer survivors. Cancer survivors can facilitate these efforts by partnering with their health care providers and community organizations.

Keywords

Oncology; Supportive care; Qualitative; Implementation; Exercise

Introduction

Promoting physical activity among rural cancer survivors is critical for improving health and quality of life while reducing health disparities experienced by rural populations [1, 2]. Doing so successfully requires translation (i.e., application) of evidence-based physical activity behavior change programs through broader dissemination and implementation in these populations [3]. However, such translational research is overall scant: < 10% of dissemination and implementation science research funded by the National Cancer Institute is related to physical activity or cancer survivorship [4].

Hence, implementation science seeks to understand and optimize implementation of evidence-based interventions (EBIs) when translated to non-research settings, an area of great importance for increasing the public health impact of research discoveries [5]. Only a minority of EBIs are successfully translated into broader use by non-research settings [5]. Even when this occurs, ensuring continued success of the EBI outside a research setting requires close attention to implementation strategies that improve implementation outcomes such as fidelity, uptake, etc. [5]. Bridging the gap between efficacy testing and successful implementation outside research settings requires understanding factors, including those from an organizational perspective, that impede or facilitate broader implementation success of EBIs by non-research staff in non-research settings [6]. Such identified factors can serve as targets for planning implementation strategies and identifying mediators of implementation success or failure. Implementation science, especially related to physical

activity and cancer survivors, is a nascent yet critical area requiring further study as demonstrated by the limited number of relevant published reports (i.e., protocol description [7], pre-implementation [8], implementation feasibility [9], outcomes [10], and post-implementation evaluation [11]). None of these have focused on rural cancer survivors, further exacerbating this important knowledge gap.

Recent reviews emphasize the need for research related to engaging the community to expand intervention translation and “operationalize” frameworks to guide the implementation process, plan implementation measurement, and improve implementation outcomes [12, 13, 4, 14]. Furthermore, when implementing an EBI by non-research staff in non-research settings, the chances of maintaining efficacy can be enhanced with strategies that target implementation science constructs such as those included in the Consolidated Framework for Implementation Research (CFIR). Specifically CFIR includes five major constructs (*Intervention Characteristics, Outer Setting, Inner Setting, Characteristics of Individuals, and Process*) with multiple sub-constructs as summarized and defined in a publically available table found here: <https://cfirguide.org> [15]. Frameworks such as CFIR assist with prioritizing and choosing constructs known to be related to implementation outcomes while also guiding EBI implementation planning and evaluation [14, 16, 17]. Studies carried out in populations other than cancer survivors support the applicability of CFIR constructs to physical activity promotion (e.g., *Outer and Inner Setting*) [18–20]. Also, several reports related to physical activity in cancer survivors suggest that CFIR constructs are relevant (e.g., *Intervention Characteristics, Implementation Process, etc.*) [11, 7, 9, 8, 21]. Hence, CFIR is a potentially useful framework to understand how to disseminate and implement evidence-based physical activity behavior change programs for rural cancer survivors.

Our previously conducted trial confirmed efficacy of the Better Exercise Adherence after Treatment for Cancer (BEAT Cancer) physical activity behavior change intervention [22, 23] which is now being adapted and implemented in the process of dissemination (consistent with the translational research continuum). As such, we collected data needed to guide the design of implementation strategies (e.g., staff training, identifying champions, etc.) required to translate EBIs such as BEAT Cancer to non-research settings. Such data is needed by non-research community sites, especially rural, who will deliver BEAT Cancer (using our implementation toolkit) and other similar physical activity programs. The BEAT Cancer implementation toolkit (manual, PowerPoint slides, etc.) includes guidance for program implementation by three types of facilities (therapeutic such as clinic, community-based such as community center or church, and private/commercial such as fitness facility). The toolkit also recommends 12 supervised exercise sessions (10 in Month 1 and two in Month 2), regular home-based exercise sessions beginning in week 3 with goal of 150 weekly minutes of moderate-to-vigorous physical activity by the end of the 3-month intervention, three physical activity counseling sessions (in-person or by telephone; one in Month 2 and two in Month 3), and six group discussions (three in Month 1, two in Month 2, and one in Month 3). Although exercise facilities are helpful, the toolkit suggests adaptations when implementing without traditional gym access. The toolkit also discusses community partnerships that can increase feasibility and sustainability. Cost is variable based on location yet our community partner reported an implementation cost of \$350 per person

based on administrative records. A health care provider (e.g., physician) and/or cancer center affiliation is not required. Supervised exercise is led by a fitness instructor or physical therapist while discussion groups can be led by health educator, social worker, psychologist, etc. We collected the focus group data reported here simultaneous with adaptation of the intervention to women with any cancer type and development of the implementation toolkit, and before implementation of the adapted intervention by non-research staff in a rural, cancer community clinic network site.

The primary purpose of this study was to identify constructs (i.e., factors) relevant to implementation of evidence-based physical activity behavior change interventions for rural women cancer survivors from an organizational perspective, structured within the CFIR, and using our original intervention (Better Exercise Adherence after Treatment for Cancer [BEAT Cancer]) as an example.

Methods

We conducted focus groups with stakeholders and potential program interventionists in a rural county in Alabama. Interventionists were individuals who were qualified to implement the exercise and/or discussion group components of the program (e.g., fitness professionals, administrative staff, group leaders, etc.), while stakeholders were community or organizational individuals who were qualified to facilitate or administrate program implementation activities (e.g., hospital administrators, health care providers, non-profit charitable organizations, cancer survivor advocacy groups, etc.). The focus of this report is on factors that may influence implementation from an organizational perspective, as cancer survivors are usually the recipients but not the implementers of a physical activity program. The project was approved by the local institutional review boards and all participants provided informed consent before initiating study activities.

Participants

Participants lived or worked in or adjacent to the research study county, which was defined as rural based on Rural-Urban Continuum Code (RUCC) classification (completely rural or < 2,500 urban population, adjacent [RUCC = 8] or not adjacent [RUCC = 9] to a metro area) [24]. Additional criteria included age ≥ 18 years, intact hearing, English speaking, no history of dementia or organic brain syndrome, and no significant medical, psychological, or social characteristics that would interfere with ability to fully participate. Participants were recruited using local news ads, referrals from the local cancer center, word of mouth, and meetings with the cancer center leadership and project champion. The champion's existing relationship with participants was highly variable, ranging from none to acquaintance to colleague to subordinate to supervisor. About half of participants were affiliated with the same organization as that of the project champion. Trained research staff determined eligibility (e.g., meeting study criteria) using an eligibility screening form administered over the telephone.

Focus Group Procedure

The coauthor with extensive focus group and qualitative data experience (Shewchuk) worked closely with the investigative team during development of the focus group guides (including but not limited to questions and probes) following principles and guidelines as outlined by several authoritative sources [25, 26]. Multiple investigator meetings iteratively revised the focus group guides with a predefined focus on identifying factors potentially influencing implementation (e.g., community and organizational culture and context, implementation logistics, communication, and evaluation outcomes) from an organizational perspective. The coauthor (Shewchuk) also carefully trained a staff member (Hessong) in carrying out focus groups. Hence, all focus groups were completed by the same staff member (Hessong); notes were taken at all focus groups by an investigator (Qu) or another staff member. Each participant completed one focus group; two focus groups consisting of interventionists only and four focus groups consisting of stakeholders only were completed. Participants completed a demographic survey and the intervention was described using a standardized written script reviewed and discussed with the participants. Participants were asked for their general thoughts about the intervention (e.g., benefits, concerns, costs for interventionists; how it could work best within their community or organization for stakeholders). Participants were also asked for suggestions related to measuring program success (note: the question did not differentiate between program success and implementation success). Interventionists were asked what support or actions were needed from their organization to help make the program successful and how to best train individuals to deliver the program. Stakeholders were asked how to encourage program buy-in, improve sustainability, and raise awareness of the program. Focus group sessions lasted 60 to 90 minutes and were recorded and transcribed. Transcriptions were checked by a second staff member for accuracy.

Data analyses

Descriptive statistics were calculated for the participant characteristics. Statistical analyses performed for the comparisons of means of the interventionists to means of the stakeholders included the two-group t-test for age and the exact Wilcoxon rank-sum test for the distance from home to the implementation site and the distance from job to the implementation site since both of these were determined to be non-normally distributed. Analyses performed for the categorical characteristics used Fisher's exact test for education, gender, race, and income since the assumptions for the chi-square test were not tenable. Statistical analyses were two-sided and were performed using a significance level of 5%. SAS software (version 9.4; SAS Institute, Inc., Cary, NC) was used for the statistical analyses.

For qualitative data, transcripts were coded by two research staff using NVivo 11. A directed content analysis approach [27] was used in that themes were coded using the CFIR codebook (<http://www.cfirguide.org/tools.html>). Coding was iteratively discussed resulting in inter-coder agreements (Kappa coefficients as calculated by NVivo 11) of 0.74 (interventionists' data) and 0.73 (stakeholders' data). The percent of times a theme (i.e., CFIR code) was identified was calculated for interventionists and stakeholders separately. In summary, qualitative data rigor was addressed by careful iterative focus group guide development in collaboration with a qualitative data expert (Shewchuk), use of a single moderator also trained by our qualitative data expert, presence of note taker and post-group

debriefings, transcription double checking, use of a publically available and well-established codebook, multiple iterative discussions involving coders and the first author to ensure sufficient Kappa coefficients, and close read of all coding results by several authors (Rogers, Goncalves, Smith). Also, giving the subjective nature of qualitative data coding, some quotes were allowed more than one thematic code.

Results

Five (46%) of interventionists were fitness specialists or instructors with 3 (27%) being administrative staff (logistical management) and 3 (27%) being gym manager, patient navigator, or health educator. Seven of the stakeholders (37%) were hospital administrators, 5 (26%) were health care professionals (nurse or physician), 4 (21%) were community organization representatives and 3 (16%) were social workers or occupational therapists. Participant characteristics obtained by survey are provided in Table 1. Distance from job to the implementation site was significantly less for the employed interventionists vs. stakeholders ($p < 0.001$; Table 1). The association between income group (<\$50,000 vs. \$50,000) and participant group was statistically significant ($p = 0.041$; Table 1); eight of the 11 interventionists and all 19 of the stakeholders had incomes \geq \$50,000. All five major CFIR constructs were identified as demonstrated by the following percent of times the construct was coded for interventionists vs stakeholders: *Implementation Process* (35% vs. 32%), *Intervention Characteristics* (34% vs. 31%), *Inner Setting* (16% vs. 23%), *Outer Setting* (15% vs. 10%), *Characteristics of Individuals* (0.2% vs. 4%). Narratives are summarized and representative quotes provided below along with a unique identifier for each individual quoted (e.g., Int-1, Shr-1, etc.).

Implementation Process

The *Implementation Process* sub-constructs present in the narratives were *Engaging* and *Reflecting and Evaluating*. *Engaging* is defined as the process of attracting and involving the appropriate individuals in the process of implementation [15]. Although *Engaging* for the *Implementation Process* involves individuals beyond the intervention recipients alone, statements related to *Engaging* often focused on cancer survivors. *Engaging* strategies identified as implementation facilitators included: 1) communication between cancer survivors and leadership (those responsible for implementation or physicians) to encourage and educate participants and local community, 2) healthcare provider support and referrals, 3) utilizing individuals who can champion the program, 4) building relationships with community partners who have an interest in improving the health of cancer survivors, and 5) enhancing buy-in via effectively communicating program results (benefits). Increasing awareness through radio, television, civic groups, and churches was identified. Also related, technology-based *Engaging* strategies were frequently mentioned (e.g., text messaging, email, web-sites, Facebook, Twitter, employee forums, and Instagram) with an acknowledgement that the technology-based strategy should be based on the target audience (e.g., Facebook for older individuals and Instagram for younger ones). Representative quotes related to *Engaging* are as follows:

Interventionist (Int-1) - "...our physicians play a huge role in leadership....It's not just centered around the oncologist, it's really about your primary and the internist in the area as well. Getting them on board."

Stakeholder (Shr-1) - "Website, Facebook page, if they have that... through social media, through the parish nurses, through programs, places people will frequent and it's going to capture a survivor. It could be at the barber shop, the beauty shop. You have to think outside the box. You have to not think, 'Oh well they're just going to go to the store and see it. They're going to pick it up in the newspaper' "

With regard to *Reflecting and Evaluating* (i.e., feedback regarding the implementation progress and quality) [15], interventionists emphasized quantitative health measures as a way to document implementation quality (e.g., blood pressure, weight, resting heart rate, number of doctor visits, ratings of perceived exertion, minutes of weekly exercise, etc.). Stakeholders identified quantitative (e.g., depression, distress, quality of life surveys) and qualitative (e.g., participant evaluation) measures. Evidence of intervention benefits when implemented in a non-research setting is an indicator of sufficient intervention fidelity and can be used to maintain organizational buy-in and support. Moreover, client outcomes (e.g., quality of life, etc.) are important outcomes to consider during implementation [28]. Hence, representative quotes related to *Reflecting and Evaluating* are as follows:

Interventionist (Int-2) - "...I might [be able to] show a decrease in blood pressure over a period of time with exercise or even if they are a diabetic ...how much medications that they are on."

Stakeholder (Shr-1) - "I think you have to ask the patient or the survivor what their goals are in order to be successful....I think some of its quality and some of its quantity. "

Stakeholder (Shr-2) - "...There's things that exercise tends to help and demonstrate that these things improve, it could be more incentive for people."

Intervention Characteristics

Intervention Characteristics (i.e., intervention aspects that may influence implementation [29]) were present within the following sub-constructs: *Design Quality and Packaging*, *Cost*, *Evidence Strength and Quality*, *Adaptability*, and *Complexity*. For *Design Quality and Packaging* (i.e., perception of how the intervention is bundled, presented, and assembled [15]), interventionists identified creating a program which encouraged support among participants (e.g., group fitness options, accountability partners). Stakeholders suggested variety (e.g., different exercise, educational, and motivational activities), participant incentives, interventionist training (knowledge and motivation), and participant support or "buddy systems" as ways of improving implementation success through greater recipient uptake. Representative quotes related to *Design Quality and Packaging* are as follows:

Interventionist (Int-3) - "...it sounds like a great program, but I would hate to say at 12 weeks we're done....I would like to follow them for a year."

Stakeholder (Shr-1) - “I mean, you can be trained in exercise physiology for cancers, and you can go through and know what the exercises are...but just to make sure they even understand...different disease processes and side effects.”

Stakeholder (Shr-3) - “And be careful how you label exercise....You really have to say it is a holistic approach, it’s not just cardio, yoga is a [possibility]...It is just how you present it. There may be different ways or different tracks a person could get on...”

For *Cost*, interventionists identified participant expenses (e.g., transportation costs, exercise equipment [including clothing], childcare, gym fees) and stakeholders identified implementation cost (e.g., exercise specialist certifications, collecting and managing program evaluation data) as implementation barriers. In contrast, offsetting costs with charitable contributions, grants, and fundraisers (strategies identified by stakeholders) would facilitate implementation success. Representative quotes related to *Cost* are as follows:

Interventionist (Int-4) - “Well, yeah, paying someone to take you here and there, if you don’t have the money for it, you certainly can’t do it.”

Interventionist (Int-5) - “Yeah, if you can’t cover childcare to come get a treatment or to come see a doctor and then it’s going to be really less likely that you are able to get child care to go exercise.”

Stakeholder (Shr-4) - “I would look at supporting the FTE [full time equivalent] of the exercise specialist, the training that comes with getting certified, cost of the assessments, time.”

For *Evidence Strength and Quality* (i.e., stakeholders’ perception of the evidence supporting the intervention’s ability to achieve the desired outcomes [15]), stakeholders and interventionists suggested using current research to motivate participants and convince stakeholders of program benefits while stakeholders also proposed incorporating participant testimonies. Representative quotes related to *Evidence Strength and Quality* are as follows:

Interventionist (Int-6) – “Just learning with the American College of Sports Medicine and seeing what kind of research is being done with exercise and cancer survivors...”

Stakeholder (Shr-1) – “...so not just ‘oh you need to exercise’ but getting down to why it’s important and breaking it down on a health literacy level also.”

For *Adaptability* (i.e., the intervention’s ability to be adapted to meet the specific local needs [15]), interventionists and stakeholders recommended the program be adaptable to a cancer patient at any point in recovery and at any fitness level. Stakeholders suggested *Adaptability* strategies allowing multiple scheduling options, exercises ranging from seated yoga to water aerobics, inclusion of caregivers, and changes over time to keep the program “fresh”. Representative quotes related to *Adaptability* are as follows:

Interventionist (Int-7) - “...when you look at the spectrum of cancer survivors, there is going to be some that have the ability to start off at the low intensity exercise...some people just

need to learn their ADL [activities of daily living] basic functions before they are at a level where they can then move into ‘Okay now I can exercise’.”

Stakeholder (Shr-3) - “For those that have pain, more slower pace, maybe water type stuff, maybe yoga ... or just stretching.”

With regard to *Complexity*, interventionists commented on the difficulties cancer survivors may face while exercising as an implementation barrier if the intervention is too complex or difficult. Stakeholders compared implementation to “basically running a business” and prioritized making program enrollment, implementation, and logistics easy to manage to facilitate implementation success. Representative quotes related to *Complexity* are as follows:

Interventionist (Int-3) - “And if you make them really sore the first time, they’re not going to come back...but I don’t think a cancer survivor’s going to want that...they don’t want to be in any more pain.”

Stakeholder (Shr-5) - “...easy to access, easy to implement, not require a huge amount of time commitment or financial commitment.”

Inner Setting

Within the *Inner Setting* construct (i.e., features of the organization that will be conducting the implementation [29]), *Implementation Readiness*, *Implementation Climate*, and *Structural Characteristics* were present in the narratives. For *Readiness* (i.e., organizational commitment to intervention implementation [15]), interventionists identified educational resources (e.g., educational modules with post-tests), “cheat sheets”, intervention delivery scripts, hands on learning, direct observation of others implementing the program, cancer-specific training, and interventionists who can provide motivation and support to participants as important for facilitating implementation. Stakeholders identified proper funding, staff, training resources, educational resources, ongoing telephone support, and community engagement as important to address prior to implementation. Stakeholders also identified that organizational resources were needed to initiate the program while sustainability would require outside support (e.g., philanthropic). Representative quotes related to *Readiness* are as follows:

Interventionist (Int-7) – “...they survive their cancer, they are devastated and they don’t know how to start back to a life and a quality of life.... So, yeah, education, knowing what that resource is I think is a big thing.”

Stakeholder (Shr-1) - “...but just to make sure they [exercise trainers/physiologists] even understand [cancer passes and side effects].”

For *Implementation Climate* (i.e., organizational capacity, receptivity, etc. [15]), stakeholders and interventionists emphasized the need for informing the community (especially cancer survivors) about the importance of exercise to facilitate program acceptance. Representative quotes related to *Implementation Climate* are as follows:

Interventionist (Int-2) - “I’m...thinking about the unity that we share with the cancer center...a more partnership between the patients and their physicians and the fitness specialists and I think it is an ideal opportunity to reach out to cancer patients.”

Stakeholder (Shr-6) - “I think it’s just a natural fit with us at the hospital. You’re taking care of the whole patient...Not just treatment, but that exercise option, and a way to help them maintain their stamina and just get back in the community doing things again.”

Only stakeholders had responses for the sub-construct *Structural Characteristics* of the organization (e.g., organizational infrastructure addressing patient needs). Representative quote related to *Structural Characteristics* are as follows:

Stakeholder (Shr-7) - “We do have a great program here with XXX. They actually pay for their patients, their transportation to their doctors...”

Outer Setting

The *Outer Setting* sub-constructs identified included *Patient Needs and Resources* (i.e., how well the organization knows and prioritizes patient needs) and *Cosmopolitanism* (i.e., organizational networking with outside entities [15]). Stakeholders and interventionists identified multiple patient needs and resources (e.g., childcare, lack of exercise and nutrition knowledge, costs, socioeconomic status, cancer specific exercise modifications, etc.) which the organization should be aware of if implementation is to be successful. Representative quotes related to *Patient Needs and Resources* are as follows:

Interventionist (Int-3) - “...some of those people just need that encouragement of, hey I missed you. We want to see you back in the gym.”

Stakeholder (Shr-1) - “...but a lot of people don’t come from the outside places a lot to come in. Just because of time, gas, energy. ...if there are things in their community, and it doesn’t have to be a bright lights and Hollywood thing. It can be in a community center, it can be exercise on a ball, it can be things that they can do, things that people have even.”

For *Cosmopolitanism*, stakeholders stated that implementation success could be increased by connecting with local retailers, religious organizations, fitness centers, rehabilitation facilities, and other community affiliates in order to provide supplies, funding, facilities, or other types of support. Interventionists suggested using local community organizations to run fundraisers and provide advertising for the program. Representative quotes related to *Cosmopolitanism* are as follows:

Interventionist (Int-7) - “...there’s other organizations....They sponsor walks where people in the community would come and have a community walk...”

Stakeholder (Shr-8) - “...most of the little small churches have vans. They probably could be willing to work out transportation for people...”

Characteristics of Individuals

Within the *Characteristics of Individuals* construct, interventionists identified *Knowledge and Beliefs* (e.g., improving implementation success by combating the decline in participant motivation with accountability and social support) whereas stakeholders identified intervention recipients' stage of change and mental health as implementation barriers. Representative quotes related to *Characteristics of Individuals* are as follows:

Interventionist (Int-8) - "Just maybe these participants will ...continue just because they developed among a certain camaraderie..."

Interventionist (Int-5) - "... so in their [cancer survivor's] mind they think 'okay, I am going to get fit, I am going to get toned, I am going to get healthy, and I'm going to lose some weight.'..."

Stakeholder (Shr-1) - "Where are they in that motivation aspect of it? ...Maybe someone's not exercising because he or she is depressed or there's something going on...?"

Discussion

Multiple sub-constructs within the five major CFIR constructs were identified by the focus group narratives. Most themes were described as strategies for improving implementation success while also identifying implementation barriers within the sub-constructs of *Cost* and *Characteristics of Individuals*. Also, the interventionist and stakeholder focus groups were generally similar with regard to the percent of times a construct was present with the exception of a few sub-constructs within *Inner Setting* and *Characteristics of Individuals*. Narratives elucidated potential strategies for targeting these constructs during implementation including but not limited to physician buy-in, community involvement, using quantitative and qualitative data during evaluation, fundraisers, etc. Importantly, narratives elucidated strategies for targeting identified constructs at multiple levels (e.g., individual, organizational, and community) for enhanced implementation success. Hence, the implementation toolkit included suggestions for dealing with many of the constructs identified as important for implementation success (e.g., staff training for readiness, cost, physician buy-in, champion identification, collaboration with community partners, etc.). Our next step is to test the toolkit usefulness and explore the CFIR constructs targeted by the toolkit as potential mediators of implementation success when implemented in other sites. Moreover, these data assist with prioritizing the 26 CFIR constructs for further study in future research, as only 14 emerged as themes for our qualitative data.

Our data are consistent with other reports related to physical activity program translation finding that implementation success was related to *Cosmopolitanism* (i.e., organizational networking with outside entities), *Engaging, Patient Needs and Resources, Cost, Adaptability*, and *Readiness* (e.g., instructor training) [18, 11, 19]. We did not identify confusion about eligibility criteria, a factor associated with implementation success in the report by Beidas et al. [11], most probably because our program was intended for any woman with a history of cancer who did not have a contraindication to exercise rather than restricted to only breast cancer survivors with lymphedema. Also, the collection of our data

before the non-research site implemented the intervention may explain, in part, the fact that the data reported here did not find physician referral process problems (e.g., *Networks and Communications*) or difficulty with reporting requirements beyond what is normally done (e.g., *Culture*), factors identified as important for physical activity program implementation success in prior reports [11, 19].

Several implications related to implementation practice warrant highlighting. Individuals involved in implementation of physical activity programming in their communities should be aware of the recovery trajectory post-cancer treatment and able to adapt intervention implementation for a range of limitations caused by cancer and its treatment side effects. Also related, implementation should consider and address the potential financial, time, and energy limitations in this population (exacerbated by longer travel distances in rural areas). Strategies targeting *Cosmopolitanism* and *Engaging* should consider building and maintaining relationships with community partners with similar priorities, churches, civic leaders, local retailers, transportation services, home health agents, parish nurses, organizational leaders, and physicians. Also relevant to *Engaging*, narratives supported engaging physicians in two capacities: 1) program support and referrals and 2) communication with interventionists regarding physical limitations. *Reflecting and Evaluating* should clearly show program results and not overlook the value of the individual success story in maintaining engagement and program support. Lastly, optimizing technology-based communication and social media strategies was suggested and is anticipated to become more feasible as broadband access increases in rural settings.

Although our study is limited by its single geographic area and minimal minority representation, the factors described are common in other rural settings (e.g., transportation costs, etc.) and suggested strategies (e.g., seek foundation support, identify community partners to assist with transportation, etc.) are generalizable to other locations [30–32]. Nevertheless, further study directly comparing factors important for successful implementation of physical activity interventions in rural vs. urban settings are needed to better elucidate potential differences. Also, the need to adapt to a variety of physical abilities is generalizable to other chronic disease populations. Notably, a major study strength is our focus on an understudied and underserved population that is less likely to be physically active (rural, cancer survivors) [33–35]. We also investigated the implementation process from both the stakeholder and interventionist perspective and, in so doing, obtained data related to an important implementation science knowledge gap in cancer survivorship [4, 36]. Future research is needed to determine whether targeting the constructs identified in this report can indeed mediate the effect of implementation strategies on physical activity intervention implementation success in this underserved population [37–39].

Implications for Cancer Survivors

Organizations promoting physical activity programs for cancer survivors must overcome implementation barriers including but not limited to cost, necessary expertise, and lack of awareness. Cancer survivors can facilitate these efforts by partnering with their health care providers, cancer center, and local community organizations to raise awareness and

champion these efforts. It will “take a village”, with cancer survivors being their own best advocate, to bring physical activity promotion to a broad range of cancer survivors.

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Table 1.Interventionists and Stakeholders Demographics ^a

Variable	Interventionists (N=11)	Stakeholders (N=19)	p value
Age (years)	42.3 ± 15.3 (22–70)	49.2 ± 9.7 (37–73)	0.14
Distance from home to implementation site ^b	22.7 ± 18.7 (2–65)	25.3 ± 14.4 (1.5–45)	0.45
Distance from job to implementation site ^{b, c}	2.8 ± 6.2 (0–18)	20.3 ± 16.7 (0–45)	0.007
Education			0.45
13 – 16 years	7 (63.6)	8 (42.1)	
17 years	4 (36.4)	11 (57.9)	
Gender			1.0
Female	9 (81.8)	15 (78.9)	
Male	2 (18.2)	4 (21.1)	
Ethnicity			n/a
Not Hispanic/Latino	11 (100)	19 (100)	
Race			1.0
White/ Caucasian	11 (100)	18 (94.7)	
Black/ African American	0 (0)	1 (5.3)	
Annual household income			0.041
< \$50,000	3 (27.3)	0 (0)	
\$50,000	8 (72.7)	19 (100)	

^aValues presented as mean ± SD (range) or number (percent).

^bDistance from home and job to the non-research implementation site reported in miles.

^cParticipants who were employed (n = 10 for interventionists and n = 18 for stakeholders)