

Conducting photovoice with binational cancer survivors to identify health behavior change intervention preferences

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ABSTRACT

Background: Culturally adapted behavior interventions are needed to support lifestyle behavior change for survivors of cancer.

Objectives: To identify programming preferences of Mexican-origin survivors of breast cancer living on the US/Mexico border.

Methods: We conducted a nine-week photovoice project with survivors of breast cancer in Nogales, Sonora, Mexico exploring viewpoints on food and dietary habits, wellness activities, and preferences for healthy lifestyle intervention programming. Photovoice, a participatory qualitative research technique, provided participants with research skills to document and share their lived experience through photographs. Weekly sessions began with photograph presentations and concluded with group discussion of common themes. Data were analyzed following a thematic content analysis using session notes and written narratives compiled during discussion sessions.

Results: Survivors ($n=6$) worked collaboratively with facilitators to identify themes related to diet and physical activity behavior. Connection between food and culture and the importance of enjoying meals with others was emphasized. Primary activity interests included leisure-time recreation that relieved anxiety related to their cancer diagnosis rather than regimented exercise routines. Participants noted the importance of giving and receiving social support and emphasized altruism to support positive mood and self-efficacy during survivorship. Networking and knowledge sharing were considered valuable.

Conclusions: Our findings highlight the importance of collaborative research such as photovoice to gain insights for adaptation of evidence-based lifestyle interventions for Mexican-origin survivors of cancer. Key adaptation considerations include culturally relevant dietary preferences

and patterns, physical activities with a strong mind-body connection, and opportunities for social engagement and experience sharing.

KEYWORDS: border health, cancer survivorship, photovoice, diet, physical activity, social support

Introduction

Among Hispanic women, breast cancer is the leading incident cancer and the leading cause of cancer mortality in the United States¹. While Hispanic women experience lower breast cancer incidence than Non-Hispanic White (NHW) women, Hispanic women are more likely to be diagnosed at later stages of disease with larger tumors and experience higher mortality from breast cancer than NHW women^{1,2}. Here we focus on survivorship in the United States (US)/Mexico border region, of which little is currently known about cancer preventive lifestyles. Individuals residing in this region have unique culture and traditions and self-identify as Mexican-origin (MO).

Some lifestyle behaviors, such as smoking, are associated with risk for several types of cancer, including breast cancer^{3,4}, while others, such as physical activity, are protective against secondary cancers, cancer recurrence, and comorbid conditions^{5,6}. Though the American Cancer Society (ACS) publishes physical activity and dietary guidelines for cancer survivors^{7,8}, only 10-20% of all survivors are physically active after treatment and adherence to dietary guidelines is poor⁹⁻¹². MO survivors of breast cancer often experience disparities related to social determinants of health previously shown to contribute to poorer adherence to diet and physical activity recommendations compared to NHW women^{13,14}. The observed disparities in adherence to healthy lifestyle behaviors also are influenced by poor access to health promotion interventions in MO populations^{15,16}. Current lifestyle behavior interventions generally lack cultural relevance^{17,18}. For MO women, social norms, access to resources, cultural health beliefs, and food preferences are major factors that influence health behaviors and decisions^{19,20}. Culturally tailored lifestyle behavior interventions are warranted to support behavior change in MO populations, including those in border regions²¹⁻²³.

The purpose of this project was to utilize photovoice methodology to characterize lifestyle behaviors in MO survivors of breast cancer and to discover acceptable approaches for program adaptation and delivery. The objectives of this project were to work collaboratively with MO breast cancer survivors to characterize knowledge, attitudes, and beliefs towards healthy lifestyle behaviors; identify facilitators or barriers towards meeting healthy lifestyle recommendations in cancer survivorship; and to distinguish participation preferences for healthy lifestyle programming. Results from this work provide the basis for a cultural adaptation of existing curriculums for an evidence-based lifestyle program to support health behavior change in MO survivors of cancer.

Methods

Study Design

This qualitative study is the second phase of *Vida Plena*, derived from *vivir una vida plena*, meaning to live a full life. *Vida Plena* is a community-based participatory research study^{24,25} developed between Mariposa Community Health Center (MCHC) and the University of Arizona Cancer Prevention and Control Research Network (AzCPCRN). The first phase of *Vida Plena*, semi-structured interviews, focused on exploring the knowledge and beliefs of survivors of breast cancer living at the US/Mexico border towards healthy diet and physical activity behaviors. Results revealed that survivors perceive the Mexican diet as unhealthy, there is a lack of reliable diet-related information provided to them, physical activity is perceived as beneficial for symptom management after cancer treatment, and family supports healthy lifestyle behaviors²⁶. Building from the ACS physical activity and dietary guidelines for cancer survivors^{7,8}, a photovoice qualitative research approach was employed in this phase of inquiry to

explore participant viewpoints on food and dietary habits, physical activity, and social support as well as healthy lifestyle intervention programming preferences.

Methods for *Vida Plena* were adapted using a facilitators manual published by Powers, et al.²⁷. We translated the materials to Spanish and reduced the number of sessions to minimize participant burden. Five sessions were conducted over the span of nine weeks, each lasting 2-3 hours. Approval from the University of Arizona Institutional Review Board was obtained prior to project commencement (IRB: 2005660838) and all study participants provided written informed consent prior to study enrollment. Each participant provided permission for their photos, names, and narratives to be published.

Community Academic Partnership

MCHC is a designated Federally Qualified Health Center in Nogales, Arizona, which provides primary care services to half of all residents of Santa Cruz County, Arizona. Nogales, AZ and Nogales, Sonora are sister cities located on the US/Mexico border where life and culture are highly interconnected. MCHC community health workers (CHWs) have close ties to the community and are the fundamental drivers of health promotion programming, including cancer screening efforts, treatment navigation, and survivorship support. A breast cancer support group has been facilitated by CHWs at MCHC for over 20 years and the current facilitator (TE) has developed a strong network with the survivors. The University of Arizona joined the national CPCR^N²⁸ in 2019 to assist development of a community-based research collaborative located in Southern Arizona. AzCPCR^N is dedicated to supporting cancer research and implementation science focused on the needs of the Hispanic population, specifically communities located along the international border. Partnership between MCHC and the AzCPCR^N was established to

support this goal, building on decades of community engaged participatory research between MCHC and the University of Arizona Prevention Research Center.

Participants and Recruitment

The opportunity to participate in photovoice was publicized through an electronic flyer shared over *WhatsApp*²⁹ to participants of the existing MCHC breast cancer support group. Participants of the support group then shared the opportunity with their peers. A bilingual and bicultural AzCPCRN research staff member (RV) followed-up with interested participants to conduct an eligibility screen and complete the informed consent process. Recruitment took place June-July 2021. The relationship between the facilitator (TE) and the participants in the breast cancer support group and the communication provided by AzCPCRN staff (RV) via *WhatsApp* were essential for timely recruitment of interested women to the project. Participants were eligible if they self-reported Hispanic ethnicity, were at least 18 years old, had a history of breast cancer diagnosed within the past 15 years, and were female.

Data Collection: Photovoice

Photovoice is a participatory qualitative research approach and innovative strategy to capture cancer survivor experience and lifestyle behaviors³⁰. It equips and empowers participants with research skills to document their lived experience through photographs, which can then be shared with other members of the study group and generate discussion and garner perspectives on a given area of research interest. The photographs and their associated narratives provide rich visual data to support qualitative research.

Though originally planned for remote completion due to the SARS-CoV-2 coronavirus disease (COVID-19) pandemic, input from MCHC CHWs and participants supported transitioning to an in-person format. Thus, as restrictions for in person meetings were relaxed following public health recommendations, face to face meetings with necessary protective precautions in place (e.g., masks, social distancing) were scheduled.

Prior to commencement of the five photovoice sessions, all consented participants completed a questionnaire to collect relevant demographic, clinical, and social data. All study materials were available in English and Spanish; however, all sessions were conducted in Spanish as it was the preferred language of all participants. To reduce participant burden related to COVID-19 travel, sessions were conducted in Nogales, Sonora at a local restaurant which provided an isolated room away from the main dining area. Facilitators and participants living in the US traveled across the border with logistical assistance from MCHC CHWs who work binationally.

The project timeline followed protocols established for photovoice qualitative research²⁷ and are detailed as adapted for this project in Table 1. During the week between in-person sessions, participants collected digital photographs related to the topic. All participants had a personal smartphone, which were utilized for study participation. Five photographs and short written narratives were sent from each participant to a MCHC CHW (TE) via *WhatsApp*. Participants selected the two most meaningful to discuss and share with the group. Before the next session, research staff organized the photos and associated written narratives participants selected into a slideshow to present to the group. Photos were also printed so each participant had a hard copy to reference.

Discussion sessions began with individual presentations of the photographs. Participants explained the background for the picture, how it relates to the topic, and what it means for them

and their lifestyle. After presenting, participants paired up to complete a SHOWeD form about their two chosen photographs³¹. Detailed in Table 1, SHOWeD elicits deeper conversations about why these situations exist and how to educate others. The facilitator (RV) promoted group discussion by prompting 1) strengths and weaknesses, 2) similarities and differences, and 3) identified and connected themes.

Innovative Participant and Facilitator Interaction

Participants and facilitators continued contact between meetings via a *WhatsApp* group where facilitators reminded participants about meetings and checked in mid-week to ask about progress with photo collection. Participants actively engaged in the group chat and shared healthy products they had come across for meal preparation, shared personal photographs from events happening in their lives, and invited participants and facilitators to engage in physical activity outside of the regularly scheduled photovoice meetings. *WhatsApp* became a form of social support for the participants to share their own experiences and to help each other achieve their healthy lifestyle behavior goals. These interactions allowed the participants to become familiar with each other and during group discussion sessions, they were more comfortable sharing intimate details of their lives and their survivorship experience.

Data Analysis

All sessions were audio recorded and note takers (SW, TE, LG) kept track of discussion points during each session. To analyze the data, session notes and SHOWeD forms were compiled to create a comprehensive outline of the main points of participant discussion. This outline included both original Spanish and English translation. Following a thematic content

analysis³², MCHC CHWs and AzCPCRN research staff who attended the photovoice sessions met to discuss key points that arose from the meeting notes, transcripts, and SHOWeD forms. Codes were thematically grouped based on session topic and subcategories were created based on identified facilitators and barriers to healthy lifestyle behaviors.

Results

A total of 12 breast cancer survivors were contacted to participate in the study. Of those contacted, seven enrolled in the project, two could not attend because of scheduling conflicts, two were not interested, and one did not participate due to COVID-19 concerns. One participant dropped out after the training session due to scheduling conflicts, resulting in a total of six survivors participating in photovoice.

All participants were MO, female with a history of breast cancer, and Spanish speaking. The average age of participants was 50.3 (range: 38-68) years and the average age at diagnosis with breast cancer was 40.3 (range: 28-51) years. Four participants had a family history of cancer (66.7%). All participants experienced at least one comorbid condition, with two experiencing four or more. The most common comorbid conditions experienced were vision problems (50%) and high cholesterol (50%). Five participants were born in Mexico and one in the US. All participants currently live in their country of birth and receive healthcare binationally.

The topics of discussion were informed by the ACS guidelines for nutrition and physical activity^{7,8} and semi-structured interviews conducted previously²⁶. Social support was included based on survivor input from earlier qualitative research²⁶. Upon discussion with participants and Mariposa CHWs, it was noted that diet (“dieta”) held a negative association with feelings of restriction and that food (“alimentación”) should be the topic as it focuses on overall dietary

pattern. Rather than focusing on exercise (“ejercicio”) for the second topic, participants also noted that this particular translated word relates to formal exercise regimens and that it would be more relevant to focus on “actividad física” referring to broad body movement and wellness activities.

Participants, MCHC CHWs, and AzCPCRn research staff reviewed collected photos collaboratively and assigned each to a general category before considering common themes which arose from group discussion and through analysis of the SHOWeD forms (Table 2). Themes primarily centered on enablers to health behavior change or positive aspects of health rather than barriers. Evaluation of the photovoice process indicated that all participants strongly agree that the process was fun, meaningful, and influential for community learning and change.

Consuming all foods in moderation is key for survivor health

Survivors were conscious of nutrition’s impact on health. They noted that “la nutrición y la educación es la base de la vida” (“nutrition and education is the foundation of life”). Like the ACS guidelines, a healthy diet was perceived as high in vegetables and fruit. One participant shared a photograph of a green juice she had made and described how the ingredients benefitted her health. Participants shared with each other various products or seasonings they had come across in stores with lower sodium and natural ingredients which they perceived to contribute to a higher quality and nutritional value of their meals. Participants noted how these products could be used in traditional Mexican recipes to substitute for otherwise higher sodium or fat containing ingredients.

Photovoice participants emphasized their ability to eat anything a person who has not experienced cancer can, despite perceived social norms that survivors of cancer should have

restricted diets or eat certain foods. Survivors noted that since they have been through cancer treatment, they are more conscious of reading food labels for sodium and sugar content, but that all people would benefit from being more cognizant of the food they are eating. For example, regarding sugar, one participant noted “podemos darnos gusto con azucares con buen balance” (“we can enjoy sugars with good balance”). Participants hoped other cancer survivors remember “no entrar en fobias” (“do not develop food phobias”). The consensus was food should be enjoyed and include various ingredients, colors, textures, and nutrients.

Emphasized connection between food and culture

Many conversations surrounding food focused on the connection between meals and emotion. Survivors noted that certain meals or aromas elicit positive memories of time spent with loved ones or remind them of home. Photographs reflected this by showing traditional Mexican foods that they enjoy making for their family or family favorites. One survivor noted that “consentir a la familia [con comida] es fortaleza” (“spoiling family [with food] is a strength”). Meals for these survivors are as much about nutrition as they are about the experience of being with others.

Engaging in activity is a method for relieving stress and anxiety

Though participants initially mentioned that they do not participate in structured exercise or enjoy engaging in exercise, photos revealed a variety of enjoyable leisure time recreation that promotes physical activity such as cycling with pets, walking on the beach with friends, yoga, dancing to music, and walking with family. By guiding the discussion with the more encompassing Spanish word for “activity” (“actividad física”), participants shared engaging in a

range of physical activities with the intention to relieve stress and anxiety. Many of the activities discussed are considered physical activity, defined as any active movement of the body³³, but they did not perceive it as such since these are activities they engage in for fun and in a casual unstructured manner.

Activity as pleasurable

Engagement in activity was primarily facilitated by perceived enjoyment or relief. One participant frequently hikes “el Cerro de la Pirinola” in Nogales because it is a beautiful landscape and it energizes her with positivity. She remarked that “me olvido de todo mi estres del trabajo, ‘puro relax’” (“I forget about all my stress from work, ‘pure relaxation’”). Another participant went dancing in bars and nightclubs late into the night as a fun way to relieve stress and forget her worries. To encourage others to participate in activity, one survivor suggested “buscar la opción que los acerque al ejercicio de una forma relajada, segura y divertida” (“to seek the option that brings them closer to exercise in a relaxed, safe and fun way”).

Importance of family and peer involvement in activity

Family support and involvement facilitated a wide range of activity. One participant shared that her husband created a gym in one of their spare bedrooms for her use. Her children demonstrated support by gifting her resistance bands to train with. Her children noticed her enjoyment with the new exercise routines and “desean que sea por mucho tiempo que lo practique” (“hope she continues to exercise for a long time”). Another participant mentioned that she and her husband participate in physical activities together. At home, they garden or clean

together to support “músculos y movimiento” (“muscles and movement”). They also take daily walks or bike rides together.

Exercising at home is preferable to limited public infrastructure

The most common barriers noted for participating in activities promoting physical movement were concerns for safety and inadequacy of recreational spaces. Many noted that there is little or no lighting once the sun goes down in local parks. Sidewalks are generally uneven and can be a fall hazard, especially in the dark. Rough terrain in the area makes biking more difficult; one participant desired “más caminos para bicicletas” (“more bike paths”) which were safe to ride on. Other survivors noted that there are few public areas near enough for them to recreate in, causing many to opt for exercising at home instead.

Giving back to others supports self-esteem and mood during survivorship

Unlike food and activity, social support was considered intangible and was more difficult to document in photos that accurately reflected support, however participants appreciated the challenge. Though social support was frequently mentioned in earlier discussions, participant photographs focused on giving rather than receiving support. All mentioned the desire to give back to their communities in return for the support they received during treatment.

There were two main reasons participants felt it was important to give support to others after their cancer treatment. First, they described how altruism has helped to improve their self-confidence, self-esteem, and mood. They feel more successful having the ability to support loved ones. Second, they are interested in sharing information about their cancer experience with others. One participant notes that “tenemos que hablar con las personas de lo que pasamos y de

lo que es el cáncer” (“we have to tell people what we're going through and what cancer is”) while another said “Es normal que después de ser diagnosticada con cáncer sientas miedo y busques a alguien que ha pasado por los mismo” (“It is normal that after being diagnosed with cancer you feel fear and seek out someone who has gone through the same experience”). Many participants noted that they were not given understandable information and guidance related to lifestyle behaviors when they were diagnosed and treated for cancer, motivating them to share their lived experience and lessons learned with current patients to ease the transition to survivorship.

Discussion

Little is known of the cancer survivorship experience of MO women living in the US/Mexico border region, particularly pertaining to lifestyle, despite the higher cancer mortality burden they carry. This nine-week photovoice project with MO survivors of breast cancer in Nogales, Sonora/Arizona highlights important themes regarding their survivorship experience with food, physical activity, and social support, constituting important elements for consideration in lifestyle intervention programming. When discussing food, participants shared that it was unnecessary to follow restrictive diets for health. They noted how balanced eating and awareness when it comes to choosing foods can provide great benefits to everyone. Importantly, participants noted the connection between foods and emotion, describing how food is an important channel through which family and friend relationships are strengthened. Regarding physical activity, participants are fond of casual and entertaining activities that contribute to their physical and mental health. Lack of safe and accessible spaces were main barriers of physical activity while family and friend support were highlighted as facilitators. For social support, a recurrent theme was the importance of altruism and dual benefits at the intra and interpersonal

level. Participants consider it crucial to seek out and engage in social support to help others while navigating their own cancer survivorship experience. A lack of information and education regarding health behavior and its role in cancer survivorship served to motivate participants to share this information with survivors diagnosed after them.

The current study is unique in that, to our knowledge, this is the first study to utilize a photovoice methodology approach among a sample of binational MO survivors of breast cancer and to evaluate any lifestyle factors in the context of cancer survivorship. Overall, the majority of studies utilizing photovoice methods among Hispanics are among youth and adolescents³⁴⁻⁴⁰, have focused on general health topics³⁵⁻³⁷ or issues such as substance abuse³⁸. Among the few studies that have focused on Hispanic adults, diabetes management⁴¹, family planning⁴², and health among immigrants and day laborers⁴³ were among the most common topics. Although not set as an *a priori* outcome, using photovoice as a research strategy in the current study provides evidence on the cultural acceptability and richness of qualitative data to be gained with this methodology. Importantly, the photovoice experiences provided more in-depth understanding of programming needs and played a role in affirming as well as complimenting data collected using more common qualitative approaches.

Literature shows that there are few culturally adapted, evidence-based behavioral interventions for Hispanic survivors of cancer^{21,44-46}. Most large randomized controlled trials have been conducted among NHW survivors⁴⁷⁻⁵¹. *¡Cocinar Para Su Salud!* was a nine-session, culturally adapted dietary intervention conducted with Hispanic survivors of breast cancer in New York City wherein research staff conducted focus groups with Hispanic women to determine the content and adaptations needed prior to implementing the intervention⁵². The intervention showed preliminary efficacy in dietary change, supporting the role of qualitative

research-informed interventions. Importantly, Hispanic survivors residing in New York City have different cultural values than MO survivors residing along the US/Mexico border. Like our findings, however, participants shared their preference for content that has been culturally adapted by region and origin. Project VIVA! was a 16-week culturally adapted exercise intervention conducted with Mexican American and Puerto Rican survivors of breast cancer which showed preliminary efficacy in increasing physical activity. Social support was also associated with increased physical activity⁵³, substantiating our finding that health behaviors are influenced by family and peer involvement. Adapting interventions for language and culture creates a stronger connection between participants and intervention activities and facilitators^{54,55}. The results from the current study have informed the cultural tailoring of a 25-week dyadic randomized, controlled diet and physical activity intervention for Hispanic female survivors and their caregivers which will soon begin recruitment in Southern Arizona. Photovoice informed on the study design including curriculum topics, definitions of healthy diet and physical activity, confirmed the need for bilingual materials and health coaching, and suggested the need to support regular sharing of information and activities to promote wellness among survivors.

These findings echo those of the semi-structured interviews completed in phase one of *Vida Plena*²⁶; however, photovoice is unique as a participatory approach which provided participants training and opportunity to actively engage with and guide the research. Group discussion supported open conversation about influences for lifestyle behavior that highlighted common perspectives. The group dynamic fostered comradery amongst survivors of cancer and supported engagement with the process. Participants were not only committed to attending and actively participating in weekly activities, but also met outside of the scheduled meetings to participate in walks as a group and share recipes and tips for a healthy diet. Another strength of

this study is the use of media as an advocacy tool. Participants strongly desire to share the results of this project with their community and future survivors of cancer living along the US/Mexico border. They shared these findings within their community and local policy makers during a gallery showing and plan to expand their support group. Limitations of the current study include small sample size and limited generalizability. The study was conducted during the COVID-19 pandemic and the timing and world circumstances may have influenced participant responses and discussion.

Our results demonstrated the high utility of a photovoice process to accomplish adaptations of evidence-based interventions to the local geographic and cultural context. Future healthy lifestyle behavior interventions incorporating our findings may increase relevancy for MO survivors of cancer. Specifically, interventions should follow a strengths-based approach⁵⁶⁻⁵⁸ since participants focused largely on the positive aspects of their health and the support systems that enable them to make healthy lifestyle behavior changes. Including companionship or peer-interaction may support participant self-efficacy and positive affect. Building on relationships with family and friends provides feelings of connection and belonging which ultimately can promote health behavior change. Additionally, considerations should be made for the perception of diet, physical activity, and social support in this population by incorporating traditional dietary preferences and patterns, physical activities with mind-body connections, and opportunities for family, friends, and community members to engage with the survivor. Finally, participants feel there is still much they can learn from each other and support they can offer new survivors of cancer. Future interventions should include provisions for networking amongst survivors around these topic areas and broader conversations.

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References:

1. Haile RW, John EM, Levine AJ, et al. A review of cancer in U.S. Hispanic populations. *Cancer Prev Res (Phila)* 2012;5:150-63.
2. Society AC. *Cancer Facts and Figures for Hispanics/Latinos 2018-2020*. Atlanta: American Cancer Society, Inc; 2018.
3. Nekhlyudov L, Mollica MA, Jacobsen PB, Mayer DK, Shulman LN, Geiger AM. Developing a Quality of Cancer Survivorship Care Framework: Implications for Clinical Care, Research, and Policy. *J Natl Cancer Inst* 2019;111:1120-30.
4. Norman SA, Potashnik SL, Galantino ML, De Michele AM, House L, Localio AR. Modifiable risk factors for breast cancer recurrence: what can we tell survivors? *J Womens Health (Larchmt)* 2007;16:177-90.
5. Ng AK, Kenney LB, Gilbert ES, Travis LB. Secondary malignancies across the age spectrum. *Semin Radiat Oncol* 2010;20:67-78.
6. Demark-Wahnefried W, Aziz NM, Rowland JH, Pinto BM. Riding the crest of the teachable moment: promoting long-term health after the diagnosis of cancer. *J Clin Oncol* 2005;23:5814-30.
7. Rock CL, Thomson CA, Sullivan KR, et al. American Cancer Society nutrition and physical activity guideline for cancer survivors. *CA Cancer J Clin* 2022.
8. Rock CL, Doyle C, Demark-Wahnefried W, et al. Nutrition and physical activity guidelines for cancer survivors. *CA: a cancer journal for clinicians* 2012;62:242-74.
9. Coups EJ, Ostroff JS. A population-based estimate of the prevalence of behavioral risk factors among adult cancer survivors and noncancer controls. *Prev Med* 2005;40:702-11.

10. Gjerset GM, Fossa SD, Courneya KS, Skovlund E, Thorsen L. Exercise behavior in cancer survivors and associated factors. *J Cancer Surviv* 2011;5:35-43.
11. Pinto BM, Ciccolo JT. Physical activity motivation and cancer survivorship. *Recent Results Cancer Res* 2011;186:367-87.
12. Blanchard CM, Courneya KS, Stein K, American Cancer Society's SCS, II. Cancer survivors' adherence to lifestyle behavior recommendations and associations with health-related quality of life: results from the American Cancer Society's SCS-II. *J Clin Oncol* 2008;26:2198-204.
13. Nayak P, Paxton RJ, Holmes H, Thanh Nguyen H, Elting LS. Racial and ethnic differences in health behaviors among cancer survivors. *Am J Prev Med* 2015;48:729-36.
14. White A, Pollack LA, Smith JL, Thompson T, Underwood JM, Fairley T. Racial and ethnic differences in health status and health behavior among breast cancer survivors-- Behavioral Risk Factor Surveillance System, 2009. *J Cancer Surviv* 2013;7:93-103.
15. Oster NV, Welch V, Schild L, Gazmararian JA, Rask K, Spettell C. Differences in self-management behaviors and use of preventive services among diabetes management enrollees by race and ethnicity. *Dis Manag* 2006;9:167-75.
16. Orzech KM, Vivian J, Huebner Torres C, Armin J, Shaw SJ. Diet and exercise adherence and practices among medically underserved patients with chronic disease: variation across four ethnic groups. *Health Education & Behavior* 2013;40:56-66.
17. Onwudiwe NC, Mullins CD, Winston RA, et al. Barriers to self-management of diabetes: a qualitative study among low-income minority diabetics. *Ethn Dis* 2011;21:27-32.

18. Zeh P, Sandhu H, Cannaby AM, Sturt J. Cultural barriers impeding ethnic minority groups from accessing effective diabetes care services: a systematic review of observational studies. *Divers Equal Health Care* 2014;11:9-33.
19. Lim JW, Gonzalez P, Wang-Letzkus MF, Ashing-Giwa KT. Understanding the cultural health belief model influencing health behaviors and health-related quality of life between Latina and Asian-American breast cancer survivors. *Support Care Cancer* 2009;17:1137-47.
20. Montoya JA, Salinas JJ, Barroso CS, Mitchell-Bennett L, Reininger B. Nativity and nutritional behaviors in the Mexican origin population living in the US-Mexico border region. *J Immigr Minor Health* 2011;13:94-100.
21. Greenlee H, Molmenti CL, Crew KD, et al. Survivorship care plans and adherence to lifestyle recommendations among breast cancer survivors. *J Cancer Surviv* 2016;10:956-63.
22. Narayan MC. The national standards for culturally and linguistically appropriate services in health care. *Care Management Journals* 2002;3:77-83.
23. Estrada RD, Messias DKH. A scoping review of the literature: content, focus, conceptualization and application of the national standards for culturally and linguistically appropriate services in health care. *Journal of health care for the poor and underserved* 2015;26:1089-109.
24. Colorafi KJ, Evans B. *Qualitative Descriptive Methods in Health Science Research*. *Herd* 2016;9:16-25.
25. Teufel-Shone NI, Schwartz AL, Hardy LJ, et al. Supporting New Community-Based Participatory Research Partnerships. *Int J Environ Res Public Health* 2018;16.

26. Skiba MB, Lopez-Pentecost M, Werts SJ, et al. Health Promotion Among Mexican-Origin Survivors of Breast Cancer and Caregivers Living in the United States-Mexico Border Region: Qualitative Analysis From the Vida Plena Study. *JMIR Cancer* 2022;8:e33083.
27. Powers M, Freedman D, Pitner R. From Snapshot to Civic Action: A Photo-voice Facilitator's Manual, Community-Engaged Scholarship for Health (CES4Health). 2012:<http://bit.ly/OjCuL8>.
28. Cancer Prevention and Control Research Network. Prevention Research Centers, 2020. (Accessed 2022, at <https://cpcrn.org/>.)
29. Anderson E, Koss M, Castro Luque AL, Garcia D, Lopez E, Ernst K. WhatsApp-Based Focus Groups Among Mexican-Origin Women in Zika Risk Area: Feasibility, Acceptability, and Data Quality. *JMIR Form Res* 2021;5:e20970.
30. Wang C, Burris MA. Photovoice: concept, methodology, and use for participatory needs assessment. *Health Educ Behav* 1997;24:369-87.
31. Wang CC. Using Photovoice as a participatory assessment and issue selection tool: A case study with the homeless in Ann Arbor. In: Wallerstein MMN, ed. *Community based participatory research for health*: Jossey-Bass/Wiley; 2003:179-96.
32. Vaismoradi M, Turunen H, Bondas T. Content analysis and thematic analysis: Implications for conducting a qualitative descriptive study. *Nurs Health Sci* 2013;15:398-405.
33. Piercy KL, Troiano RP, Ballard RM, et al. The physical activity guidelines for Americans. *Jama* 2018;320:2020-8.
34. Hannay J, Dudley R, Milan S, Leibovitz PK. Combining Photovoice and focus groups: engaging Latina teens in community assessment. *Am J Prev Med* 2013;44:S215-24.

35. Lightfoot AF, Thatcher K, Siman FM, et al. "What I wish my doctor knew about my life": Using photovoice with immigrant Latino adolescents to explore barriers to healthcare. *Qual Soc Work* 2019;18:60-80.
36. Vaughn LM, Rojas-Guylar L, Howell B. "Picturing" health: a photovoice pilot of Latina girls' perceptions of health. *Fam Community Health* 2008;31:305-16.
37. Madrigal DS, Salvatore A, Casillas G, et al. Health in my community: conducting and evaluating PhotoVoice as a tool to promote environmental health and leadership among Latino/a youth. *Prog Community Health Partnersh* 2014;8:317-29.
38. Salerno Valdez E, Korchmaros J, Sabo S, Garcia DO, Carvajal S, Stevens S. How the U.S.-Mexico border influences adolescent substance use: Youth participatory action research using photovoice. *Int J Drug Policy* 2019;73:146-55.
39. Ross SE, Francis LA. Physical activity perceptions, context, barriers, and facilitators from a Hispanic child's perspective. *Int J Qual Stud Health Well-being* 2016;11:31949.
40. Agaronov A, Entwistle T, Leung MM. From the Lunch Table, to the Family Table: A Grounded Theory Approach to Understanding Urban Adolescents' Experiences of Food Culture Mismatch between School and Home Environments. *Ecol Food Nutr* 2019;58:23-44.
41. Baig AA, Stutz MR, Fernandez Pineros P, et al. Using photovoice to promote diabetes self-management in Latino patients. *Transl Behav Med* 2019;9:1151-6.
42. Schwartz LR, Sable MR, Dannerbeck A, Campbell JD. Using Photovoice to improve family planning services for immigrant Hispanics. *J Health Care Poor Underserved* 2007;18:757-66.

43. Fleming PJ, Villa-Torres L, Taboada A, Richards C, Barrington C. Marginalisation, discrimination and the health of Latino immigrant day labourers in a central North Carolina community. *Health Soc Care Community* 2017;25:527-37.
44. Greenlee H, Gaffney AO, Aycinena AC, et al. Cocinar Para Su Salud!: Randomized Controlled Trial of a Culturally Based Dietary Intervention among Hispanic Breast Cancer Survivors. *J Acad Nutr Diet* 2015;115:S42-S56 e3.
45. Elimimian E, Elson L, Bilani N, et al. Long-Term Effect of a Nonrandomized Psychosocial Mindfulness-Based Intervention in Hispanic/Latina Breast Cancer Survivors. *Integr Cancer Ther* 2020;19:1534735419890682.
46. Buscemi J, Buitrago D, Iacobelli F, et al. Feasibility of a Smartphone-based pilot intervention for Hispanic breast cancer survivors: a brief report. *Transl Behav Med* 2019;9:638-45.
47. Rock CL, Flatt SW, Byers TE, et al. Results of the Exercise and Nutrition to Enhance Recovery and Good Health for You (ENERGY) Trial: A Behavioral Weight Loss Intervention in Overweight or Obese Breast Cancer Survivors. *J Clin Oncol* 2015;33:3169-76.
48. Goodwin PJ, Segal RJ, Vallis M, et al. Randomized trial of a telephone-based weight loss intervention in postmenopausal women with breast cancer receiving letrozole: the LISA trial. *J Clin Oncol* 2014;32:2231-9.
49. Courneya KS, McKenzie DC, Mackey JR, et al. Effects of exercise dose and type during breast cancer chemotherapy: multicenter randomized trial. *J Natl Cancer Inst* 2013;105:1821-32.
50. Pierce JP, Natarajan L, Caan BJ, et al. Influence of a diet very high in vegetables, fruit, and fiber and low in fat on prognosis following treatment for breast cancer: the Women's Healthy Eating and Living (WHEL) randomized trial. *JAMA* 2007;298:289-98.

51. Chlebowski RT, Blackburn GL, Thomson CA, et al. Dietary fat reduction and breast cancer outcome: interim efficacy results from the Women's Intervention Nutrition Study. *J Natl Cancer Inst* 2006;98:1767-76.
52. Aycinena AC, Jennings KA, Gaffney AO, et al. inverted exclamation markCocinar Para Su Salud! Development of a Culturally Based Nutrition Education Curriculum for Hispanic Breast Cancer Survivors Using a Theory-Driven Procedural Model. *Health Educ Behav* 2017;44:13-22.
53. Mama SK, Song J, Ortiz A, et al. Longitudinal social cognitive influences on physical activity and sedentary time in Hispanic breast cancer survivors. *Psycho-oncology* 2017;26:214-21.
54. Bathum ME, Baumann LC. A sense of community among immigrant Latinas. *Fam Community Health* 2007;30:167-77.
55. Castro FG, Barrera M, Jr., Holleran Steiker LK. Issues and challenges in the design of culturally adapted evidence-based interventions. *Annu Rev Clin Psychol* 2010;6:213-39.
56. Casellas-Grau A, Font A, Vives J. Positive psychology interventions in breast cancer. A systematic review. *Psychooncology* 2014;23:9-19.
57. Warburton DER, Bredin SSD. Health Benefits of Physical Activity: A Strengths-Based Approach. *J Clin Med* 2019;8.
58. Victoria Cerezo M, Ortiz-Tallo M, Cardenal V, De La Torre-Luque A. Positive psychology group intervention for breast cancer patients: a randomised trial. *Psychol Rep* 2014;115:44-64.



Table 1. Overview of project timeline, activities, and compensation.




	Activity	Compensation
Week 1 August 10, 2021	Photovoice Training <ul style="list-style-type: none"> • <i>Introduction to Photovoice and project goals</i> • <i>Photographic techniques</i> • <i>Confidentiality and ethics</i> 	
Week 2	Photo Collection <ul style="list-style-type: none"> • <i>Each participant collected 5 food related photos and sent to research staff by August 20, 2021</i> 	
Week 3 August 24, 2021	Discussion #1: Food <ul style="list-style-type: none"> • <i>Participant presentations</i> • <i>SHOWeD^a form completion:</i> <ul style="list-style-type: none"> • <i>S- What do you SEE?</i> • <i>H- What is really HAPPENING?</i> • <i>O- How does this relate to OUR life?</i> • <i>W- WHY does this situation, concern, or strength exist?</i> • <i>e - What can we do to EDUCATE others about this situation, concern, or strength?</i> • <i>D- What can we DO about it?</i> • <i>Group discussion</i> 	US\$30 gift card
Week 4	Photo Collection <ul style="list-style-type: none"> • <i>Each participant collected 5 activity related photos and sent to research staff by September 3, 2021</i> 	
Week 5 September 7, 2021	Discussion #2: Activity <ul style="list-style-type: none"> • <i>Participant presentations</i> • <i>SHOWeD form completion</i> • <i>Group discussion</i> 	US\$30 gift card
Week 6	Photo Collection <ul style="list-style-type: none"> • <i>Each participant collected 5 social support related photos and sent to research staff by September 17, 2021</i> 	
Week 7 September 21, 2021	Discussion #3: Social Support <ul style="list-style-type: none"> • <i>Participant presentations</i> • <i>SHOWeD form completion</i> • <i>Group discussion</i> 	
Week 8	Break	
Week 9 October 5, 2021	Wrap-up and Celebration <ul style="list-style-type: none"> • <i>Comprehensive slideshow with all photos and final narratives shared with the group</i> 	US\$40 gift card


- Evaluation survey
- Graduation ceremony

^a SHOWeD form questions (from Wang, 2003)

Table 2. Participant Photographs and Emergent Themes Discussed During Photovoice (n=6)

Topic	Theme	Participant Photograph	Participant Narrative
Food	Consuming all foods in moderation is key for survivor health		<p>Taquitos de tinga <i>“Creo que comer pollo cocido aunque sea con condimentos o preparado es saludable y no tiene tanta grasa.” – Kenia</i></p> <p>Tinga taquitos <i>“I think eating chicken even with seasonings or prepared is healthy and does not have as much fat.” – Kenia</i></p>
	Emphasized connection between food and culture		<p>Carne en su jugo <i>“Comida favorita de mi familia, sus aromas evocan recuerdos muy gratos.” – Luz del Carmen</i></p> <p>Meat in its juice <i>“Favorite food of my family, the aromas of it evoke very fond memories.” – Luz Del Carmen</i></p>
Activity	Importance of family and peer involvement in activity		<p>Ejercicio en Casa <i>“Descubri una nueva forma de hacer ejercicio con ayuda de mis hijos que me animaron a usarlas.” – Luz del Carmen</i></p> <p>Exercise at Home <i>“I discovered a new way of exercising with the help of my children who</i></p>

			<p>encouraged me to use them (bands).” – Luz del Carmen</p>
<p>Activity as pleasurable</p>			<p>El Cerro de la Pirinola “Es un paisaje muy bonito. Me encanta el campo, me llena de alegría.” – Raquel</p> <p>El Cerro de la Pirinola “It is a very beautiful landscape. I love the countryside, it fills me with joy.” – Raquel</p>
<p>Engaging in activity is a method for relieving stress and anxiety</p>			<p>Escuchando Música “Me quita el estrés y la ansiedad escuchando música. Hago actividad física al bailar.” – Ivonne</p> <p>Listening to Music “It takes away my stress and anxiety by listening to music. It is physical activity when I’m dancing.” – Ivonne</p>

Social Support	Giving back to others supports self-esteem and mood during survivorship		<p>Donaciones de Pelucas <i>"Ellos están felices porque saben que hay muchas personas que les aprecian y se preocupan por ellos."</i> - Raquel</p> <p>Wig Donations <i>"They are happy because they know that there are many people who appreciate and care about them."</i> - Raquel</p>
	Desire to share knowledge and personal experience with peer cancer patients and families		<p>Confidentes <i>"He acompañando a varias personas cuando las diagnostican."</i> – Fanny</p> <p>Confidants <i>"I have accompanied several people when they are diagnosed."</i> – Fanny</p>

