

HARNESSING THE POWER OF STORYTELLING IN ONLINE PUBLIC HEALTH CAMPAIGNS: AN EVALUATION OF THE BRING YOUR BRAVE CAMPAIGN

by

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(Under the Direction of Jori N. Hall)

ABSTRACT

The Internet has become an essential and accessible source of health-related information for users across the world. Health professionals, health organizations, and government agencies develop targeted online health campaigns to disseminate information on pertinent public health topics. Online public health campaigns, through the use of websites, online forums, and social media in particular, often utilize digital storytelling to convey relevant health messages. The use of digital stories in public health promotion efforts is increasing, with a growing body of literature supporting its potential impact. Currently, there is a lack of standardized evaluation methods to assess the effectiveness of online health campaigns that utilize storytelling as a primary method of communicating health messages. This evaluation had three purposes. First, to understand the diverse experiences of college-aged women's exposure to the Centers for Disease Control and Prevention's Bring Your Brave (BYB) online public health campaign that incorporates digital storytelling. Second, to improve upon previous efforts in the evaluation of online health campaigns by employing narrative transportation theory and a mixed-methods culturally responsive evaluation design. Third, to evaluate any correlation between demographic variables and knowledge of breast cancer risk and prevention behaviors. This mixed-methods

evaluation included data from pre- and post-assessments, narrative transportation scale assessments, and focus groups. Results from this evaluation suggest that combining a mixed-method, culturally responsive evaluation methodology with elements of the narrative transportation theory is a useful methodology when determining the effectiveness of online public health campaigns that utilize storytelling to convey health messages. The incorporation of the narrative transportation theory alongside a mixed-methods culturally responsive evaluation approach has the potential to further explore the narrative transportation experiences of users. As evidenced by the COVID-19 pandemic, the use of digital stories to disseminate public health messages is increasing. This dissertation demonstrates the potential of a novel theoretical approach and innovative mixed-methods design to assess the effectiveness of future online health campaigns that utilize digital stories to convey health messages. Future online public health campaigns should consider this evaluation approach when assessing campaign impact.

INDEX WORDS: Evaluation, Narrative Transportation Theory, Culturally Responsive
Evaluation, Narrative Inquiry, Storytelling, Breast Cancer, College
Students, Focus Group Research, Mixed Methods, Online Public Health
Campaigns

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A Dissertation Submitted to the Graduate Faculty of The University of Georgia in Partial
Fulfillment of the Requirements for the Degree

DOCTOR OF PHILOSOPHY

ATHENS, GEORGIA

2020

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DEDICATION

This dissertation is dedicated to breast cancer survivors, their families and caregivers around the world. I will continue to do my part, as my mother requested as a final wish, to help prevent breast cancer in myself and anyone else.

In loving memory of mother

Lena Gayles Young

&

God-Grandmother

Alma Christine Byrd Pearsall

“Greater is He that is in me, than he who is in the world.”

1 John 4:4

ACKNOWLEDGEMENTS

Praise God from whom all blessings flow. After five long years, a 200-page dissertation, over 500 pages of papers written for comprehensive exams and courses and over 10,000 miles driven from Atlanta to Athens, I am forever grateful for my “journey to Ph.D.” Praise be to God for His endless grace, mercy, and unconditional love to sustain me throughout this journey. I am forever grateful to my son Dylan who has and continues to be my constant source of inspiration. I promise to continue to make you as proud as you’ve made me as your mom.

I would like to extend my gratitude to my dissertation chair, Dr. Jori N. Hall, for all her invaluable support and advice during my tenure at the University of Georgia. I am forever grateful for our coffee shop meetings and impromptu calls and texts. I would also extend my gratitude to my dissertation committee, Dr. Carolyn Lauckner, Dr. Melissa Freeman, and Dr. Temeika Fairley, for their support and encouragement. In addition, I would also like to acknowledge Trena Paulus for her invaluable contributions towards this dissertation prior to her departure from the University of Georgia. I would like to extend my sincerest gratitude to my village for keeping me motivated at times I wanted to quit. Thank you for your unwavering support and love throughout my Ph.D. journey.

“Trust in the LORD with all your heart and lean not on your own understanding; in all your ways submit to him, and he will make your paths straight.”

(Proverbs 3: 5-6)

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CHAPTER 1

INTRODUCTION

Storytelling has proliferated today from inspirational TED Talks and heart wrenching experiences from Humans of New York to a plethora of story-based online public health campaigns and crowdfunding sites like GoFundMe (Paulus & Roberts, 2018). The telling of these stories allows one to access the subjective reality, or the storyteller's truth, and the meanings of one's experiences. The better crafted the story, the more it impacts our lives and resonates with us (Canary Health, 2015).

“When we construct a story, we gather together a variety of linguistic, physical, historical, geographical, sensual, physiological, cultural and relational materials. Even when asked to “state the facts” about an event, our interest in conveying a “believable” or “truthful” account means that we not only add rhetorical elements to our telling, but also convey the story from a particular point of view” (Freeman, 2017, p.34).

These emotionally charged accounts of success, triumph, poverty, mistreatment, and struggle move us in more ways than one (Fernandes, 2017), often affording us the opportunity to gain knowledge through vicarious experience (Horsdal, 2012). The meanings ascertained from stories are more likely to produce knowledge than the actual stories themselves. “The power of a story to resonate, to open a space where we're engaged to feel something and reflect on a different path can be leveraged to help empower behavior change” (Canary Health, 2015). Storytelling, also known as narrative inquiry, is a powerful tool in qualitative research as it provides a wealth

of information about a person's life experiences from the perspective in which the experience was lived (Polkinghorne, 2006).

Narrative Inquiry

Narrative inquiry is a broad term encompassing the interdisciplinary study of the activities involved in generating and analyzing stories of life experiences (e.g., life histories, narrative interviews, journals, diaries, memoirs, autobiographies, biographies) and reporting that kind of research (Schwandt, 2015, p. 211). The history of narrative inquiry or storytelling long dates back to the beginning of time with roots in the humanities and other fields under narratology (Connelly, 1990). However, it wasn't until fairly recently that narrative inquiry made its debut in qualitative research as a research method. Narrative inquiry was first introduced as a method to study lived experience in the late 1990s during the decline of the positivist paradigm for social science research (Clandinin, 2006).

Narrative inquiry is often used to explain phenomena that cannot be captured or understood using quantitative methods where "meaning" rather than "truth" is the end product of inquiry (Bailey, 2002). The goal of qualitative researchers is to provide ways of understanding experience from the perspective of those who live it. (Bailey, 2002, p. 575). The underlying premise of narrative inquiry is the belief that individuals make sense of their world most effectively by telling stories (Bailey, 2002). Narrative inquiry is important for qualitative research as it can be used to: 1) understand a specific experience and impact of that experience on the individual, 2) understanding a process that happens over time, 3) gaining a big-picture understanding of the consumer, 4) understanding a general theme or concept, 5) exploring a comparison and 6) exploring a relationship between people. The researcher recognizes that storytellers select the components of the stories they tell (reconstruct) in order to convey the

meaning they intend the listener to take from the story. As online platforms become more popular for individuals to “share their story”, it is of increasing importance to understand how they are used in these spaces.

Use of Storytelling in Online Public Health Campaigns

Health practitioners have started to harness the power of storytelling in the dissemination of narrative health messages (Isberner et al., 2019; Bokhour et al., 2016; Frank et al., 2015). Narrative health messages are communications that contain a story or narrative element to further explain the health topic. Narrative health messages are often used to convey important health messages to address national public health concerns that warrant immediate attention. For example, these communications could include safety practices for handling Ebola, COVID-19 or immunization recommendations for influenza. Recent research has demonstrated that storytelling can be an effective way to enhance health communication and promote behavior change particularly within those racial, ethnic and minority populations who possess a rich tradition of storytelling (McCall, Shallcross, Wilson, Fuller & Hayward, 2019; Lee, Fawcett & DeMarco, 2016). Lee et al. (2016) noted that storytelling may have the potential to facilitate identification of sociocultural factors that influence population health outcomes. This is particularly important in cultures that have a history of storytelling and concomitantly suffer significant health outcome disparities (Leshner et al., 2018).

Most often, storytelling in online public health campaigns comes in the form of digital storytelling. Digital storytelling is defined as “the practice of using computer-based tools to tell stories and is described as merging a personal story with video, still-frame imagery, music and voice to create a personal multimedia story” (Sawyer & Willis, 2011). Digital stories are inherently short, first person visual narratives that synthesize digital images or audio recordings

of a first-person story. The use of digital stories in social marketing and public health promotion efforts is increasing, with a growing body of literature supporting their potential impact (DiFulvio et al., 2016). DiFulvio et al. (2016) states that this literature primarily focuses on the impact of narrative-as-message on audiences, rather than the impact of the storytelling process. Multiple strategies such as narrative therapy, drama, music, and visual imagery are combined to provide a method for exploring social behavior and sharing personal experiences. Sawyer and Willis (2011) note a deeper understanding is experienced when individuals are able to examine other experiences through digital storytelling. Internalization occurs as they begin to make sense of their experiences and they adjust their behavior and transfer their understanding to other aspects of their lives (Sawyer & Willis, 2011). “Whether we realize it or not, we define ourselves through stories. Understanding your own story is the key to understanding yourself, your world, and your capacity to act within that world” (Luna & Herrick, 2018).

The narrative transportation theory has been applied by health communication specialists to describe how viewing or hearing stories may result in creating attitude or behavior change. This concept of narrative “transportation” was developed in 1993 by Richard Gerrig as a way to describe the narrative experience and the literal experience of transporting when immersing oneself within a story. The concept of narrative transportation can be beneficial in health promotion as it relates to its ability to increasing awareness, knowledge, and behavior change. While behavior change is often difficult, certain narrative components of the campaign that transport the viewer can be utilized to encourage behavior change. Further research should investigate the impact of the storytelling process as it relates to narrative communications used in public health promotions. The Bring Your Brave campaign utilizes digital storytelling to convey

health education messages to young women about their breast cancer risk. The next section will take a closer look at the development and implementation of this campaign.

Bring Your Brave (BYB): A National Online Public Health Campaign

Only a month before her 20th birthday, Adrienne got the diagnosis that took half a year to discover. In July of 2007, she discovered a lump in her breast, but each doctor she visited was convinced that a college girl could never have cancer. After going through four different doctors and convincing her insurance company, she finally had a biopsy in February 2008. If Adrienne had waited another six months, she says her cancer would have progressed to stage four and she may not be here today. With no family history of the disease, her persistence was based on pure instinct. But balancing college and cancer treatments was a struggle. Though her hair was growing back, Adrienne still needed to travel back and forth each day for radiation and had a difficult time keeping up with friends. Now on the other side of her battle, Adrienne works with Susan G. Komen, a breast cancer advocacy and support group, giving talks to college students and working to change lives by sharing her own story. She mentioned one specific college speech that she did in front of 3,000 students. After her speech, countless students approached her to say they would now take their health much more seriously. And this is precisely Adrienne's goal. "I want to make this negative situation into a positive situation," she says. "I don't want another woman to have the same thing happen to them.

*(Huffington Post, 2012)
~ Adrienne Harlow, Purdue University
Diagnosed: Age 19*

Stories like Adrienne's have become increasingly common in the United States. Breast cancer is the most common cancer among women in the United States and is the second most common cause of death from cancer in women. Approximately 11% of all new breast cancer cases in the United States are found in women younger than 45 years of age (CDC Website, 2019). Young women living with a breast cancer diagnosis have been reported to experience more aggressive disease and have a poorer prognosis than older women (Katapodi et al., 2018 & Lee & Han, 2014). In addition, these women face treatment-related side effects that affect their overall quality of life (e.g., infertility, cognitive dysfunction, muscular and skeletal symptoms and cardiac and vascular disease), and are at an increased risk for developing new malignancies

(Rohan et al., 2017; Buchanan et al., 2013; Partridge, 2013; White et al., 2013). Unfortunately, many young women are unaware of their breast cancer risk or how they can currently manage their risk. As such, breast cancer in young women has become recognized as a national public health problem, and the need to educate young women about their breast cancer risk is critical for prevention efforts.

Congress recognized the need for more education around breast cancer risk factors in young women and passed the Education and Awareness Requires Learning Young (EARLY) Act, section 10413 of the Patient Protection and Affordable Care Act in 2009 and renewed in 2014. The EARLY Act authorized the Centers for Disease Control and Prevention (CDC) to “conduct a national evidence-based education campaign: (1) to increase public awareness regarding the threats posed by breast cancer to young women, including the particular risks faced by certain racial, ethnic and cultural groups; and (2) promote educational awareness, early detection, and risk-reducing practices among young women and increase the numbers of young women with breast cancer warning signs who seek immediate care” (Congress.gov, 2019). Campaign efforts are required to include the promotion of education materials that are culturally responsive, coherent, and trustworthy to resonate with young women in a way that may potentially result in preventive behavior. Also, Healthy People 2020, the federal government’s prevention agenda for building a healthier nation, calls for “an immediate and urgent need to reduce the number of new cases of cancer, cancer-related illnesses, and cancer-related deaths in the United States and to educate the public about cancer risks and prevention” (Guilford et al., 2017).

In response to the EARLY Act and Healthy People 2020 objectives related to cancer education, the CDC launched the BYB campaign to educate young women about their breast

cancer risk through the sharing of real stories of young women affected by breast cancer. BYB aims to inspire young women to learn about their risk for breast cancer by talking to their health care providers and living a breast healthy lifestyle (CDC, 2020). The BYB campaign's target audience is women aged 18-44, particularly those women whose family history and backgrounds predispose them to a higher risk for breast cancer at a young age. This includes women with a family history of breast or ovarian cancer, African American, and Ashkenazi Jewish women. Additionally, the campaign encourages women of average risk to live a breast healthy lifestyle by engaging in regular physical activity, maintaining a healthy weight, and reducing alcohol consumption (CDC, 2020). The BYB campaign was executed through digital and social media in the form of recorded videos and podcasts of stories of women affected by breast cancer primarily due to the target audience's increasing presence online and in social media. The BYB campaign has four main objectives:

1. Encourage young women to learn their family history of breast and ovarian cancer.
2. Educate young women on the risk factors for breast cancer before the age of 45.
3. Inspire young women to talk to their health care provider if they think they may be at a higher risk for breast cancer.
4. Encourage young women to live a healthy lifestyle and be aware of the own breast health (CDC, 2020).

The campaign was designed to encourage the target audience to click for more information, share the content with friends and family, "like" the content and otherwise engage with it in the digital sphere as they learn more, become educated, and take steps to protect their health.

Campaign messages were developed after conducting extensive formative research with the primary intended audience to tailor the campaign materials to suit the target audiences' preferences and educational needs. Several focus group discussions provided campaign

developers with actual dialogue and character descriptions that were incorporated into the women's stories to ensure that it would be relevant to the target audience. In addition, focus group data provided insight on whether the existing materials were adequate in communicating key concepts and whether or not campaign materials under development will motivate women – both those with average risk and those with increased risk of developing breast cancer – to respond to the calls to action and engage with activities promoted by campaign messages (Sapsis, 2015). The findings from the formative research led to the refinement of existing materials and the development of new, targeted, and more culturally appropriate materials (Sapsis, 2015). Focus groups were made up of representatives of the BYB target audience: African American, Ashkenazi Jewish, and the general public. All family groups had at least one woman aged 18-45, and all reported having a family history of breast or ovarian cancer. Additional focus groups were held with representatives of the BYB target audience without a family history of breast or ovarian cancer to provide further input on campaign materials. It is essential to understand what risks and misconceptions are currently understood by this population to develop appropriate health communication and marketing campaigns that convey culturally responsive information that resonates with the target population.

Previous evaluation efforts of the BYB campaign included an environmental scan that provided CDC with core insights to shape BYB, into a credible and distinct digital campaign. The environmental scan included a review of the social media landscape, published literature and materials, and interviews with key informants. Focus groups were conducted to explore women's knowledge, attitudes, and behaviors around breast health and breast cancer risk and reactions to initial messaging and design concepts to further enhance the campaign.. The BYB campaign is currently monitored and tracked using website metrics (unique visits, page views, top search

keywords/phrases, etc.), social media metrics (impressions, engagements, reach, campaign hashtag use, etc.), paid media (impressions, completed video views, etc.), partnership metrics (number of partners, visibility of campaign messages online, etc.), earned media (placements, key themes, audiences reached, etc.) and online landscape measures (volume of posts about the campaign, trends over time, tone of posts/comments, etc.). These metrics have been helpful in improving the reach and visibility of the campaign; however, it fails to measure the effectiveness of the message or call to action the campaign resonates. Currently, there is a lack of standardized evaluation methods to evaluate the effectiveness of online health campaigns that utilize storytelling as a main method of communicating health messages. This evaluation seeks to explore a novel approach of combining a mixed-methods culturally responsive evaluation with the narrative transportation theory to determine the effectiveness of such campaigns.

Statement of the Problem

Online public health campaigns have become a popular way to disseminate information on pertinent public health topics. The opportunities to interact with the public, target hard-to-reach groups, and create dynamic public health campaigns are endless (Gough et al., 2017). Public health agencies and departments have begun to utilize social media sites to reach people with culturally responsive health messages through the implementation of online public health campaigns. As such, it is becoming increasingly important to evaluate such campaigns to fully understand how these campaigns impact their target audiences. However, there is limited research on the most effective evaluation methods for story-based health campaigns. This evaluation proposes a mixed-methods culturally responsive approach guided by the narrative transportation theory. This methodology is novel and will contribute vastly to the field evaluation

and health communications as it relates to innovative approaches to evaluating online public health campaigns that utilize narrative approaches.

Additionally, it has been recognized that current online health communication methods have not adequately addressed the needs of diverse populations or their health disparities (Lee et al., 2016). Storytelling or narrative approaches are emerging as a promising tool to reach and effectively communicate health information among disadvantaged and minority populations (Lee et al., 2016). Yet, despite the potential benefits of storytelling in traditional health communications such as television, print, and radio, its potential impact in online health campaigns have been less studied. In addition, research on perceptions of the narrative source on message effectiveness and its relative impact on behavior change is minimal and has not been well studied.

Purpose of the Evaluation

This evaluation has three purposes. The first is to better understand the unique experiences of college-aged women's exposure to CDC's BYB public health campaign. As noted previously, college-aged women are a key audience for the campaign as they are at a critical age in which they may adopt healthy behaviors that may lower their risk of breast cancer. This population has been identified as low users of the BYB campaign. This evaluation will further explore the reasons why college women are not engaging with the campaign as much as their older counterparts. The second purpose of this evaluation is to study and/or improve upon previous efforts in the evaluation of online health campaigns by employing a mixed-methods culturally responsive evaluation design. This design includes a quantitative knowledge assessment before and after exposure to the BYB campaign and a qualitative focus group to better understand how increases in knowledge occur in response to narratives in the BYB

campaign. The final purpose of this evaluation is the use of the narrative transportation scale to evaluate the effectiveness of the digital stories and podcast in the BYB campaign and how transportation may or may not influence behavioral change.

Evaluation Questions

Evaluation questions were discussed in detail with the evaluation stakeholders of this campaign. Evaluation stakeholders expressed the desire to understand why college women were not engaging with campaign materials and determine ways campaign materials could be more appealing to the audience. Previous formative research of women within the college-age revealed that resonance was a significant facilitator of continued engagement with the campaign. One of the main objectives of the campaign is to increase awareness among young women about their breast cancer risk through these digital stories, podcasts, and infographic material. Baseline knowledge of breast cancer risk is assumed with this population and has not been thoroughly assessed to determine if messaging is at a level of health literacy that resonates with this population. As such, there were two questions that focused on baseline knowledge and knowledge attainment after exposure to the campaign and if there was any correlation between demographic variables and knowledge of breast cancer risk and prevention behaviors. As the research notes a positive association with high narrative transportation scores and behavior change, an evaluation question was developed to better understand how narrative transportation is experienced in college women. A follow-up evaluation question further explores how these experiences can provide more understanding into the strengths and limitations of the BYB campaign for this population. The final evaluation question assesses the novel methodology used in this evaluation and its recommendations for future use in campaigns that utilize digital stories as a tool to convey health messages. Specifically, the five evaluation questions are as follows:

1. How does knowledge of breast cancer risk and prevention correlate with variables of age, race, current year in school, smoking status, alcohol consumption, self-reported health status, genetic testing, family cancer history of an extended family member among college women?
2. How does exposure to the Bring Your Brave campaign correlate with increases in knowledge in breast cancer risk factors and breast cancer prevention?
3. How do college aged women experience narrative transportation in response to viewing or listening to Bring Your Brave campaign stories?
4. What do these experiences tell us about the strengths and limitations of the form and content of the BYB campaign messaging strategies?
5. To what extent is a mixed method design, including the use of narrative transportation theory within focus groups, effective in the evaluation of online public health campaigns that utilize storytelling to convey health and risk messages?

Significance of the Study

Seldom do public health campaign researchers follow up with online public health campaign users to determine if the campaign increased their knowledge and/or influenced their attitudes and/or behavior change. This is especially critical in a campaign where storytelling is used to promote these changes. This evaluation contributes to the field of evaluation and health communications as it relates to novel approaches of evaluating online public health campaigns that utilize storytelling to convey health and risk messaging. The use of narrative transportation theory has not been used in previous research to evaluate the effectiveness of narrative-based online public health campaigns. In addition, narrative transportation theory has not been utilized in many studies using focus groups despite its potential benefits. This study provides additional insights into the user transportation experience before and after exposure to an online public health campaign that utilizes storytelling to convey health or risk messaging. As a result, this evaluation provides health communicators with more informed information for designing campaigns that appeal to potential users of the campaign.

This study also contributes to a better understanding of how to apply mixed methods for evaluating online public health campaigns that utilize narrative messaging. Specifically, this study provides some insight into combining quantitative assessment data, often the sole source of evaluation metrics, with qualitative focus group data, to provide a greater understanding of women's experiences of the BYB campaign.

Summary

Storytelling can be beneficial in health promotion as it relates to increasing awareness, knowledge, and behavior change. While behavior change is often difficult, certain components of the campaign that transport the viewer can be utilized to encourage behavior change. The proceeding chapter provides a review of the current literature on breast cancer in young women, including brief highlights of subgroups at greater risks and opportunities for intervention in college-aged women and a review of literature of best practices for evaluating online public health campaigns. In addition, chapter two highlights the use of the narrative transportation theory in the proposed evaluation. Chapter three details the evaluation design for the proposed evaluation. Chapter four highlights the results of the evaluation, including the analysis of the pre- and post-assessments and narrative transportation scores. It also includes a qualitative analysis of focus group sentiments about the campaign. Finally, Chapter five provides a comprehensive discussion of the results and its significance to the field of evaluation. Public health implications and final conclusions are also noted here.

Definition of Key Terms

Culture

Represents an intersection of identifications held by individuals plus identifications of collective groupings such as organizations, institutions, communities, societies and nations (Kirkhart, 2010)

Culturally Responsive Evaluation (CRE)

A theoretical, conceptual, and inherently political position that includes the centrality and attunedness to culture in the theory and practice of evaluation. (Hopson, 2009, p.431)

Digital Storytelling

The practice of using computer-based tools to tell stories and is described as merging a personal story with video, still-frame imagery, music and voice to create a personal multimedia story. (Sawyer & Willis, 2011)

Mixed Methods

“the type of research in which a researcher or team of researchers combines elements of qualitative and quantitative research approaches (e.g., use of qualitative and quantitative viewpoints, data collection, analysis, inference techniques) for the purposes of breadth and depth of understanding and corroboration (Johnson et al., 2007).

Narrative

“A story or series of events that has an identifiable beginning, middle, and end, during which characters may encounter and then resolve a crisis or crises” (Green and Fitzgerald, 2017)

Narrative Messaging

Narrative messaging is broadly defined as “any representation of a sequence of connected events and characters that has an identifiable structure, is bounded in space and time and contains implicit or explicit messages about the topic addressed” (Bokhour et al., 2016)

Narrative Transportation Theory

“Refers to the experience of being consumed by the world of a narrative, of being so immersed in a story that connection to the real world may be lost for some time. Transportation can occur in written, spoken/audio, and visual narrative (e.g. text and video), and can result from both fictional and nonfictional narrative. While transported, a person’s mental systems and capacities become concentrated on events occurring during the story, causing individuals to lose track of time, lack awareness of the surrounding environment, and experience strong emotions as a result of the narrative.” (Green and Fitzgerald, 2017)

Online Public Health Campaign

The promotion of health messaging using an online platform such as a website, blog, discussion forum and/or social media site such as Facebook, Instagram, Twitter, etc.

Web Analytics

“The measurement, collection, analysis and reporting of web data for purposes of understanding and optimizing web usage. It can also be used to assess and improve the effectiveness of a website” (Wikipedia)

Young Breast Cancer Survivors

Women diagnosed with breast cancer at age 45 or younger. These women may currently be living with breast cancer or their breast cancer is currently in remission. (CDC, 2019)

CHAPTER 2

LITERATURE REVIEW

This chapter provides a review of the literature that explores the popularity of online public health campaigns, storytelling as a communication strategy in public health messages and how online public health campaigns are evaluated (identification of best practices and methodologies). In addition, this literature review explores current literature on breast cancer in young women, population subgroups at a higher risk for breast cancer, breast cancer knowledge in college women, and breast cancer risk education/awareness to facilitate an understanding of the Bring Your Brave (BYB) campaign underpinnings. Last, a description of the narrative transportation theory utilized for this study is provided.

Popularity of Online Public Health Campaigns

Health communication and marketing campaigns that promote positive behavior change are a cornerstone of public health and behavioral science (Fridinger, 2018). The Internet is a major platform for the public to seek health information and resources due to its relative convenience and anonymous nature (Hui, Wai-Ching Wong & Fu, 2015). Online public health campaigns, through the use of websites, online forums, and social media, have become a popular way to disseminate information on pertinent public health topics (Hui et al., 2015). The opportunities to interact with the public, target hard-to-reach groups, and create dynamic public health campaigns are endless (Gough et al., 2017). In 2015, it was reported that 65% of adults have social networking accounts with more than 310 million active users on Twitter and over 1.09 billion daily active users on Facebook (Gough et al., 2017). Today, over 69% of Americans

use social media to connect with one another, engage with news content, share information and entertain themselves (Pew Research Center, 2018). As such, researchers have taken an interest on how online public health campaigns influence health behaviors and outcomes.

Cost Effectiveness

Online public health campaigns are a quick and efficient way of disseminating health information on a large scale. Online campaigns are relatively inexpensive in comparison to traditional media like television and radio ads and can generate a larger reach, given the increasing popularity of the Internet. Allom et al. (2018) conducted a cost-effective analysis of online and television formats of public health campaigns in order to better understand the independent and synergistic effects of these two media. The authors utilized a smoking cessation campaign that featured emotionally charged messages and media that displayed the effects of smoking-related cancers. The messages consisted of two 30 second ads and three 15 second ads that offered contact information for smoking cessation quitlines at the end of the ad. Various conditions were alternated over a 16-week period in which the online campaign would air followed by a television campaign and a combination of the two.

The authors' calculated costs based on those associated with producing and broadcasting the campaign materials separately (similar materials were used for each media). The authors measured effectiveness based on four factors: 1) unique page views to the campaign website, 2) calls made to the quitline, 3) online registrations for their online quit tool, and 4) request for a mailed smoking cessation resource. A telephone survey was implemented to assess campaign awareness among various demographics. Overall, the authors found that the online format of the campaign was the least expensive condition and achieved more of the campaign outcomes than the television version of the campaign. The authors also noted that quitline calls were higher

during the weeks when the online campaign was aired versus the television campaign. The authors observed no clear patterns of change between the number of individuals who accessed the online tool or requested the mailed smoking cessation resource. However, authors did note a higher level of campaign awareness among the combined television and online conditions compared to viewing the campaign only online. These findings are encouraging for public health professionals who often have limited resources for public health message dissemination. It is imperative to understand the media preferences of a campaign's target population in order to make an informed decision on the media type. There may be instances in which television campaigns are more favorable than online campaigns. This extra step of determining these preferences can vastly contribute to the impact of the campaign.

Determinants of User Engagement

As noted previously, a key component of using online public health campaigns as opposed to other media is understanding the preferences of the campaign's target audience. User preference aids in understanding how the target audience uses the Internet, where the campaign may be housed, and how messages are crafted. Dunn et al. (2018) sought to understand the psychosocial determinants of teens' online engagement in a drug prevention social media campaign. The authors conducted focus groups of adolescents aged 12-17. The data from their focus groups were used to develop public health implications for future campaigns that target this population of individuals. The authors first suggest that organizations must remain informed about changing trends in teens' social media use across media platforms (Dunn et al., 2018). Social media platforms evolve over time, as do their audiences. Keeping abreast of the target audience's preferred social media platform ensures the campaign is broadcasted in a place where the target audience is more likely to observe and engage with it. The authors also note

importance in understanding why specific social media platforms are preferred over others. They stated Facebook was less preferred by teens due to the significant adult presence (Dunn et al., 2018). They found that social media platforms that offer more private spaces were more favorable for teens and may be more likely to engage in prevention campaigns that appear in these spaces. Authors also denote a need for engaging teens in shaping online conversations about drug use and prevention. User testing aids in these activities and ensures the campaigns resonate with the audience. When resonance occurs, individuals are more likely to engage in the desired behavior of the campaign and more likely to share the message with others (either online or offline). The authors do ebb on the side of caution with this sentiment; despite resonance, some teens may be reluctant to engage due to various social concerns (Dunn et al., 2018). Mainly if the desired behavior violates online norms and offends peers who actively participate in the undesired behavior (Dunn et al., 2018). The authors note that these nuisances potentially be overcome through raising campaign awareness offline, perhaps in a school setting, to facilitate more desirable online engagement. Further, the authors recommend leveraging multiple media channels as opposed to just social media alone. This is important when implementing online public health campaigns on a global scale, particularly in varying demographics.

Global Health Education Opportunities

As social media becomes more prevalent among people across the world, the potential for health education across the world is endless. Several public health agencies and organizations, such as CDC and WHO, are utilizing social media to disseminate public health messages, education, and support services on a global level. The recent COVID-19 pandemic has afforded these agencies the opportunity to disseminate public health messages quickly via the internet/social media. Several public health campaigns have been launched to help educate

Americans and people worldwide about best practices for hand washing, wearing masks, and safely practicing social distancing. These campaigns have included instructional videos on how to properly wash hands to reduce the spread of COVID-19 and dispel any myths that may have circulated as a result of misinformation spread from unreliable sources. Bonnell et al. (2020) developed some fundamental principles when developing quick interventions/campaigns that promote total population adherence to specific safety messages. In this case, the safety message was social distancing during the pandemic. Bonnell et al. (2020) recommend the following key principles for developing such campaigns:

- Clear and specific guidance for exactly what behavior individuals should adopt to implement
- “Protect each other” messages that stress how desired behaviors benefit the group and protect its most vulnerable members. This can be enhanced by providing concrete examples, powerful images and the actual voices of those we need to protect linked to specific advice on how to implement the desired behavior
- “Stand together” messages from voices representative of and trusted by the group rather than those perceived as partisan or self-interested.
- “This is who we are” messages that draw upon the social norms of group which also reflect and affirm group culture and behavior
- Avoidance of messages based on fear or disgust in relation to other people
- Avoidance of authoritarian messages
- “Make a plan and review it regularly” messages that help maintain behavior change by helping people to anticipate possible barriers and enablers to adherence
- “Make it possible” messages tend to be more persuasive and effective if there is a clearly communicated offer of timely and generous support
- “Style of messaging” messages that are communicated via professionally designed and appealing mass and social media campaigns
- Theory of change where each campaign is considered an intervention with campaign briefs to note how campaign activities aim to generate behavior impacts
- Co-design to allow for design and piloting with relevant audience groups utilizing online engagement and ethnography and focus groups. Polling and mixed methods research data should be used to assess the impact of the overall campaign (Bonnell et al., 2020)

Overall it appears that social media can be an essential tool when disseminating public health/health promotion materials, particularly on a national or worldwide level. It is vital to select a platform that appeals to your target audience and craft messages that resonate with the

population. One also must consider how reach can be increased through use of paid promotion and the use of influential partners and also consider ways in which campaigns can be evaluated. If Bonnell et al.'s (2020) key principles are considered in the development and implementation of any public health campaign, the possibilities for a large-scale behavioral change may potentially be observed.

Storytelling has recently been recognizing as a promising method for conveying health messages to the public. Public health professionals have begun to utilize this method within their online public health communications. The next section will further explore this phenomenon and shed some light on its relevance to knowledge, attitude, and behavioral change.

Storytelling in Public Health Communications

As noted previously, storytelling has become a popular method among public health professionals to convey important health messages to the public (McCall et al., 2019). Researchers have found that narrative health messaging has been effective in cancer communication to encourage cancer prevention behaviors such as screenings and engaging in healthy lifestyle behaviors (Krakow et al., 2017). Krakow et al. (2017) noted that the “use of graphic narratives are likely to transport audiences into the story world and promote meaningful engagement with the message.” Further, the authors note how these narratives can be used in public health to relieve fears of a procedure, address concerns of cost or dispel any myths or misconceptions (Krakow et al., 2017). These elements can be extremely important when considering public health communication on a global or national scale.

Personal health stories have been studied in primarily cancer, diabetes, and hypertension and appear to be most effective with low-income patients, racial/ethnic minorities, and individuals with low health literacy (Lipsey et al., 2020). Lipsey et al. (2020) conducted a

scoping review of the literature to understand how personal health stories could be used to educate, motivate, and reduce fears among those who resemble the storyteller. Throughout their search, they found several studies that noted that participants experienced a positive impact after viewing/listening to the personal health stories of those who resemble them. Public health professionals and health providers have begun to use these personal health stories in campaigns or other promotional materials to impact attitudes, knowledge, behaviors, or clinical outcomes for their communities and patients, particularly those of similar ethnicities as the storyteller. On the contrary, Beach et al. (2019) sought to determine if similar outcomes could be observed if the storyteller's ethnicity was different from the viewer/listener of the story. Beach et al. (2019) introduced a cancer-related story told by a white family. Participants, who were of different ethnicities, viewed the story, which was based on actual phone conversations between family members regarding a family member's cancer diagnosis, treatment, and death (Beach et al., 2019). Results demonstrate that African Americans were significantly more likely to favor the story than whites or other persons of color. The authors attribute this finding to the prominence of oral communication traditions in the African American community. This finding also suggests there may be additional opportunities independent of identification that may influence a story's ability to resonate with its listeners.

Additionally, stories have been used to build relationships among healthcare providers and patients to facilitate care and treatment options, particularly in cancer survivors (Roher et al., 2017). Arthur Frank developed a typology of three different narratives to further explore this phenomenon of relationship building through storytelling. The narrative types were developed based on interviews Frank conducted with cancer survivors alongside his own personal

experience with cancer. The narrative types and each of their key characteristics are displayed in Table 1.

Table 1

The Frank Narrative Types

Key characteristics of narrative type		
Restitution	Quest	Chaos
• Frequently told in Western medicine • Usually follows this storyline: “Yesterday I was healthy; today I am sick, but tomorrow I will be healthy again” • Individuals who tell restitution narratives want their health to be restored to “normal” • Individuals often look to an external source, such as the treatment or the providers to return them to “normal” • In studies with adults, “normal” often means a return to a former pre-illness self • In our study with adolescents, “normal” meant restoring them to the self that they feel they would have been had they not had cancer	• The narrator portrays him- or herself as embarking on a journey of transformation after an illness diagnosis • The narrator describes learning something from the illness experience and shares the resulting wisdoms with others • Wellness is not defined in relation to the narrator’s understanding of “normal.” Rather, it represents a newer, wiser state that the narrator has claimed	• Often disjointed and without structure • Emphasize human vulnerability and helplessness • According to Frank, chaos narratives emerge with hindsight, when a person is outside of and thinking back on the chaos • The storyteller imagines his or her body

Roher et al. (2017)

Frank noted that these relationships, along with cultural and personal preferences, guide patients towards particular narrative types. The authors’ recommended the use of these narrative types as a listening tool so that healthcare providers, patients, and caregivers are more aware of the types of stories being told and how they can approach sensitive topics and conversations. The authors

also note that a better understanding of narrative types can aid better awareness of the healthcare providers' personal preferences, values, and beliefs that may be imposed on the patient. This helps promote shared understanding and trust between the provider and the patient, thus creating an open space for communication.

Evaluation Methodologies of Online Public Health Campaigns

Several methodologies have been proposed for thorough evaluations of social media public health campaign evaluations. Several studies have employed process, formative, and summative evaluation methods, while others have adapted methods from all three. Norman (2017) examined the literature for the most appropriate evaluation methods for public health campaigns. In his analysis, he determined that social media creates a relationship between the host and the audience, and this conversation can range in complexity. For example, the relationship between the host and the audience can be one-way (as in host to the audience) or many-way (as in audience to new audience). He notes that conversations cannot be judged as “effective,” but as learning opportunities that can lead to more useful things (Norman, 2017). As such, Norman (2017) recommends a mixed-methods approach to assess the effectiveness of public health campaigns. The incorporation of mixed methods acknowledges complexity while maintaining rigor (Norman, 2017). Norman (2017) recommends the following methods:

- Observations (number of posts, nature and content of posts, number, nature and content of replies, time and date of post, relation between the posters or referrer to one another and relation of posts to one another)
- Traditional web analytics (number of visits, length of visit, etc.)
- Reflective practice (paying attention to regular patterns of behavior outside of theory)
- Ethnographic methods (observations and conversation analysis and narrative analysis)

- Social network analysis
- Qualitative interviewing

As Norman (2017) suggests, there is no one way to evaluate public health campaigns. He suggests that it does involve triangulation of methods, particularly those evident in mixed methods approaches.

In a recent evaluation conducted by Gough et al. (2017), researchers conducted a quasi-experimental feasibility study to assess the efficacy of a Twitter intervention on skin cancer prevention. This study aimed to test the feasibility of designing, implementing and evaluating a bespoke social media enabled intervention for the dissemination of public health messages to prevent skin cancer (Gough et al., 2017). Employing a mixed-methods approach consisting of surveys and focus groups, researchers were able to demonstrate that social media is a feasible platform for the dissemination of public health messages due to its ability to provide dynamic and tailored messages in real-time (Gough et al., 2017). Gough et al. (2017) also examined the impact of employing different message frames. Shocking content elicited the most considerable number of impressions where humorous material elicited greater public engagement compared to personal story messages. Gough et al. (2017) also examined people's motivations for retweeting. Previous research has noted these motivations can include: self-enhancement, social interaction, personal benefit and appreciation, entertainment, or for informative purposes. The Gough et al. (2017) study found that the most retweeted message was that of an informative nature. Gough et al. (2017) also addressed the use of using paid posts to generate additional website traffic; however, they did not find any value in using paid-for, promoted tweets. They indicated that the use of influential users resulted in more website traffic and engagement. Chung (2016) found a similar result in his study to identify major Twitter players in a health campaign.

A study conducted by Theiss, Burke, Cory, and Fairley (2016) sought to better understand the relative impact of Facebook user engagement for both the Know: BRCA and BYB public education campaigns. Over a period of two years, Theiss et al. (2016) collected analytic data from the CDC Breast Cancer Facebook page (where both campaigns were placed). Engagement rate was calculated by dividing the number of unique users that liked, clicked, shared, and/or commented by the number of unique users reached (Theiss et al., 2016). Results demonstrated that posts that included a photo had the highest engagement rate, followed by status posts and videos. Theiss et al. (2016) found that time had an impact on engagement. Theiss et al. (2016) found that posts released early in the morning and between the hours of 2-6 pm had the highest engagement rate. From these and other results, researchers determined that visual content could be more effective in facilitating engagement in public health social and digital media campaigns (Theiss et al., 2016). Theiss et al. (2016) also suggested from an evaluation methodology standpoint; future studies should incorporate qualitative assessments to better understand the effect of the campaign materials and examine effectiveness across other social media channels.

Ayers et al. (2016) introduced a novel framework for the evaluation of a health campaign. They noted that traditional modalities alone could not altogether inform how awareness campaigns are expected to work as they often cannot assess how campaign messages are diffused via new media or how they are shared on social media. In their study, the authors examined how a message spreads through news and social media and leads to user engagement via information seeking with the core message (Ayers et al., 2016). Their example examined media coverage of smoking cessation over some time, along with social media shares on Twitter, internet searches, National Smoking Quitline records, and information retrieval using a quasi-experimental

approach. Using this multi-faceted approach, the researchers were able to conduct a comprehensive evaluation of an awareness campaign.

Another study by Lim, Wright, Carrotte, and Pedrana (2016) examined the literature to describe evaluation practices used in health promotion social networking sites to measure reach, engagement, and effectiveness. Specifically, the study focuses on reviewing methodologies that demonstrate “real-world uptake” and its scalability. Lim et al. (2016) noted the following as the most popular methods for evaluating social networks (open or closed designs): web analytics, surveys, routine data extraction, biological/objective measures, referral rate, content analysis, qualitative methods, and population-based surveys. Despite this, Lim et al. (2016) did not find a consistent measure for evaluating health promotion social networking sites. However, Lim et al. (2016) did find a study that employed a novel evaluation strategy that utilized the use of network-based analysis for evaluating interventions.

After analyzing all their results, Lim et al. (2016) compiled a list of recommendations for evaluating social media public health campaigns and/or health promotion. These include:

- Consider a variety of measures to determine effectiveness – ecological, objective, qualitative and quantitative
- Objective and biological outcomes are important to enable assessment of effectiveness and impact and should be considered in the planning phase of the intervention
- Use mixed-methods evaluation design where possible, especially for measuring engagement
- When assessing reach, think beyond raw numbers of likes and followers, consider denominators and demographics or characteristics of users
- Avoid using cross-sectional surveys without a comparison group to measure effectiveness
- Consider multiple aspects of the intervention in evaluations – reach, engagement and effectiveness are all important
- Evaluations can balance rigor and real-world application (consider quasi-experimental designs)

Similarly, Rudov et al. (2016) developed recommendations for evaluating online public health campaigns after conducting an outcome evaluation of a smoking campaign. The authors conducted a mixed-quantitative methods design utilizing a post-campaign survey (to gauge the exposure of the campaign) and Google Analytics (monitor campaign's website activity). The smoking campaign was aired on all media broadcasts, including TV, radio, and the internet, where listeners were encouraged to visit the campaign's website to learn more information. One of the main recommendations resulting from this study is the future direction of such evaluations to integrate a self-sorting method into digital online platforms that may aid in identifying different types of adopters for targeted dissemination and follow-up (Rudov et al., 2016). The ability to conduct additional monitoring after exposure to the campaign can allow evaluators to better evaluate the relative impact of the campaign and afford campaign developers to better tailor campaign materials for the target population.

Overall, there does not appear to be a gold standard when evaluating social media or online public health campaigns. Best practices suggest using a mixed-methods approach for triangulation of results. There seems to be an opportunity to develop novel strategies for evaluating social media.

Breast Cancer in Young Women

Approximately 11% of all breast cancer cases in the United States are found in women younger than 45 years of age (CDC, 2019; Rosenberg et al., 2015). Young breast cancer survivors (defined as a woman diagnosed with breast cancer under the age of 45) experience more aggressive disease and face treatment-related side effects that affect their overall quality of life (e.g., infertility, cognitive dysfunction, muscular and skeletal symptoms, and cardiac and vascular disease) (Rohan et al., 2017; Buchanan et al., 2013; Partridge, 2013; White et al., 2013).

Breast cancer in young women, aged 45 and younger, is more likely to be hereditary than breast cancer in older women and more likely to be found at a later stage when it is more aggressive and difficult to treat (CDC, 2019; Rosenberg et al., 2015). Racial differences exist in breast cancer incidences at all ages and in breast cancer mortality of young women (Shoemaker, White, Wu, Weir and Romieu, 2018). African American women account for 14% of cases among women younger than 40 and 8% greater than 40. In contrast, Caucasian women account for 76% of cases among women younger than 40 and 85% of cases among women older than 40 (Poorvu & Partridge, 2020). Young black women less than 40 years of age are more likely to have a higher breast cancer mortality rate than white women (Shoemaker et al., 2018). Researchers attribute these differences in survival rate to possible variations in tumor morphology, stage at the time of diagnosis, access to care, quality of treatment, (Shoemaker et al., 2018) and adherence to screening policies (Franzol et al., 2019). Also, many women are not aware of their risk for breast cancer or how they can manage their risk (CDC, 2019). As such, young women must be knowledgeable of their own breast cancer risk to engage in preventative behaviors that may avert getting breast cancer.

Breast cancer not only threatens a patient's physical well-being but for a young woman, it also threatens several aspects of life that are integral to role functioning. The diagnosis comes at a time when many are interested in building a family, and the recommended treatment may impair future fertility. Fertility is a primary issue for young women, and, at the time of diagnosis, the majority report being concerned about the risk of becoming infertile with treatment, particularly those who are nulliparous, very young, and receiving chemotherapy. Certain chemotherapy treatments can cause premature menopause and associated short-term side effects, such as vasomotor symptoms and sexual dysfunction, as well as long-term side effects, such as

osteoporosis, heart disease, and cognitive side effects (difficulty concentrating and forgetfulness). Sexual health is frequently a concern for young women, with up to 40% of women reporting issues with sexual interest and 60% with physical, sexual function. Young women may become less physically active early in treatment, likely contributing to the increase in weight gain experienced by those undergoing chemotherapy, but activity levels subsequently increase over the following year.

Young women experience a greater detriment to their psychosocial functioning and quality of life, both physical and mental. Given their developmental stage, young women also often need to try to balance their education or early career goals and also manage parenting issues for young children at a time of significant stress. Young women are more likely to report depressive symptoms and for their symptoms to reach the threshold of clinical depression. Factors associated with worse quality of life include a greater burden of symptoms as well as relationship and body image issues, whereas improved social support and functioning are associated with improved quality of life and exercise with improved health-related quality of life. (Poorvu & Partridge, 2020).

Population Subgroups at Higher Risk

Several population subgroups predispose a person to breast cancer. Approximately 5% to 10% of breast cancers are found in women with the BRCA1 or BRCA 2 gene mutations (Monticcolo et al., 2018). The lifetime risk for breast cancer is 50% to 85% among BRCA1 carriers and approximately 45% among BRCA2 carriers (Monticcolo et al., 2018). Women of Ashkenazi Jewish descent have a much higher risk of having a founder mutation in the BRCA mutations – about a 1 in 40 risk. A founder mutation is a specific gene mutation in a population that was founded by a small group of ancestors that were geographically or culturally isolated.

Because the population was isolated, the rate of founder mutations in descendants is much higher than it would be if the population were larger and intermingling with more genetically diverse people (Breastcancer.org, 2019).

Additionally, women who have a family history of breast cancer are at a higher risk of developing the disease with the presence or absence of any known genetic mutations (Monticillo et al., 2018). BreastCancer.org (2020) notes that young women are substantially more likely to have a genetic mutation linked to breast cancer if:

- She has blood relatives (grandmothers, mother, sisters, aunts) on either her mother's or father's side of the family who had breast cancer diagnosed before age 50
- There is both breast and ovarian cancer on the same side of the family or in a single individual
- She has a relative(s) with triple-negative breast cancer
- There are other cancers in her family in addition to breast, such as prostate, melanoma, pancreatic, stomach, uterine, thyroid, colon and/or sarcoma
- Women in her family has had cancer in both breasts
- She is of Ashkenazi Jewish (Eastern European) heritage
- She is African American and has been diagnosed with breast cancer at age 35 or younger
- A man in her family has had breast cancer
- There is a known breast cancer gene mutation in her family (Breastcancer.org, 2020)

Monticillo et al. (2018) noted that white and black women have the highest incidence and occurrence of the disease; however, black women are more likely to die of the disease. This is mostly due to delays in diagnosis and treatment initiation, which negatively affect survival (Monticillo et al., 2018). Despite these factors, there are preventive actions that young women can take to reduce their chances of getting breast cancer. A woman with a family history of cancer should talk to her healthcare provider about their risk and determine if genetic testing should occur. Several preventive factors can occur after speaking with a genetic counselor. Young women can also engage in breast self-exams for early detection of breast cancer. Learning what is normal for one's breasts, as well as reporting any abnormalities, can aid in

addressing anything at an earlier stage, which increases your chances for survival. Young women can also practice healthy behaviors such as keeping a healthy weight, getting enough physical activity, limiting the consumption of alcohol and talking to your doctor about using oral contraceptives given any breast cancer family history. Adopting these behaviors is a critical way to potentially lower one's risk of getting cancer. Health professionals must disseminate messages to young women, so they can make better-informed decisions about reducing their breast cancer risk.

Breast Cancer Knowledge, Attitudes and Preventive Behaviors in College Women

Often, breast cancer messages are aimed at middle-aged women, where there is a focus on getting mammography screenings. However, there is a unique opportunity to reach women at an earlier age when preventive behaviors can be adapted to prevent disease. Rarely do we see messages aimed towards younger women of college-age. Older studies suggest that college women who were most knowledgeable about breast cancer perceived themselves to be more susceptible to the disease and were more likely to believe in the efficacy of risk-reduction efforts (Burak and Boone, 2008). Despite this, their knowledge and beliefs were not related to their risk-reducing behaviors (Burak and Boone, 2008). There appears to be a disconnect between knowledge and risk reduction behavior adoption (e.g., healthy eating, physical activity, limiting alcohol consumption, etc.). At the time of this review, there were limited studies that assessed knowledge and risk reduction behaviors in college-aged women. This is an area of research that warrants more attention.

A more recent study conducted by Guilford, McKinley, and Turner (2017) sought to assess breast cancer screening behaviors among young women attending college in the southeastern United States. In addition to screening behaviors, the authors examined breast

cancer knowledge and beliefs. Only 46% of women reported performing breast self-exams. This is important to note that more than half of the study population was not compliant with the current recommendation of conducting regular breast self-exams. In addition, participants had low to moderate levels of breast cancer knowledge, particularly among those who did not engage in regular breast self-exams. The authors noted in a similar study that looked at women aged 35 or older that there was more compliance with breast self-exams, perhaps due to their perception of higher breast cancer risk with age. There is a need to increase knowledge within the college-age population, as there are many preventable behaviors that can be adapted to reduce the risk of getting breast cancer.

Family discussions about family cancer history are also an essential factor when considering breast cancer in young women. Breast cancer can occur in families with or without the presence of the BRCA 1 or BRCA 2 gene. An estimated 85% of breast cancers are sporadic in nature, with no known familial or genetic contributions (Fischer, Ziogas & Anton-Culver, 2018). As such, it is important to discuss family cancer histories as genetic testing can be a preventive measure. In a study conducted by Schwartz et al. (2019), researchers found that adolescent girls with genetic and familial breast cancer risk have elevated risk perceptions but exhibit similar health behaviors as their peers. While the reasons are not well understood, the opportunities for intervention are endless, particularly with healthcare providers and health educators (Lunsford et al., 2018). Adolescence is a critical time to practice more healthful behaviors to avert a cancer diagnosis later in their adult life.

Kratzke, Vilchis, and Amatya (2013) conducted a study to examine breast cancer knowledge, attitudes, and behaviors among college women and mother-daughter communication and factors that influence breast self-exams practice among college women. The authors found

that few college women received breast cancer prevention information from their mothers; however, for those who did receive advice from their mothers, those women were more likely to engage in breast self-exams. The study emphasized the importance of mother-daughter communication in the adoption of breast cancer prevention behaviors. It also noted that the conversation led to a better understanding of the perceived susceptibility and severity of the disease, and the lack thereof leads to lower perceived susceptibility and severity of the disease. It may be that this phenomenon could also be observed within a close friend or familiar units. Within colleges, sororities may be a group that could benefit from sharing these types of conversations. Sororities can connect students to one another. Although research has not linked membership to cultural understanding, many organizations are formed based on racial, ethnic, or religious lines. Sororities have become more open overall and could bridge the gap between majority and minority populations. The sisterhood bond within sororities, along with any racial disparities, may also prove to be an important and trusted source for health information and screening adherence (Olsen et al., 2008).

Theoretical Framework: Narrative Transportation Theory

This mixed-methods evaluation will draw on the narrative transportation theory to better understand college-aged women's experiences after exposure to the BYB campaign. Narrative transportation theory "focuses on the causes and consequences of an individual being immersed in a story or transported into a narrative world" (Green and Fitzgerald, 2017). Further, transportation "refers to the feeling of being so absorbed in a story that connects to the real world is lost for some time; it includes cognitive engagement, emotional experience, and the presence of mental imagery" (Green and Fitzgerald, 2017). The concept of transportation was developed

in 1993 by Richard Gerrig as a way to describe the narrative experience and the literal experience of transporting when immersing oneself within a story.

More recently, narrative transportation theory has been applied to understanding how transportation may result in creating attitude or behavior change. Green and Fitzgerald (2017) noted a study in which participants were exposed to a video story about cervical cancer. Those participants who were more transported during the story were more positive about getting a screening test afterward (Murphy et al., 2013). Transportation is measured using the Transportation Scale developed by Green and Brock (2000). The transportation scale includes 11 general items and 4 imagery items specifically related to the target narrative. All items were measured on a seven-point scale anchored by “very much” and “not at all” (see scale items in Table 2). After testing, the scale had a Cronbach’s alpha of 0.76, and it was found that dropping items would not have significantly improved the alpha. The theoretical range of the Transportation Scale was 15 to 105, where higher scores represent greater degrees of transportation.

Green and Fitzgerald (2017) note there are many ways that transportation may lead to belief, attitude, and behavior change. These include reduced counterarguing, connections with characters, heightened perceptions of realism, story-relevant mental imagery, and emotional engagement. Reduced counterarguing occurs when an individual experiences transportation into a story, they become less willing to interrupt their enjoyment of the story to engage in arguing. Often times the reduction of counterarguing leads to more considerable persuasion. When individuals can connect or identify with characters in the story, they are more likely to increase the adoption of beliefs advocated by the character. Heightened realism occurs when an individual begins to believe the story to be realistic - this greater the perceived realism, the greater the

transportation. Story-relevant mental imagery refers to the ability of the transportation experience to link vivid images within the story with beliefs implied by the story (e.g., the image of a person suffering from lung cancer may be linked with beliefs about smoking cessation). Emotional engagement occurs with compelling narratives that evoke strong emotions. These emotions may be impactful and influential in changes one's attitudes and behaviors (Green & Fitzgerald, 2017).

Table 2

Narrative Transportation Scale Items

Narrative Transportation Scale	
Panel 1: General Items	
1.	While I was reading the narrative, I could easily picture the events in it taking place.
2.	While I was reading the narrative, activity going on in the room around me was on my mind. (R)
3.	I could picture myself in the scene of the events described in the narrative.
4.	I was mentally involved in the narrative while reading it.
5.	After finishing the narrative, I found it easy to put it out of my mind. (R)
6.	I wanted to learn how the narrative ended.
7.	The narrative affected me emotionally.
8.	I found myself thinking of ways that narrative could have turned out differently.
9.	I found my mind wandering while reading the narrative. (R)
10.	The events in the narrative are relevant to my everyday life.
11.	The events in the narrative have changed my life
Panel 2: Items specific to Story	
12.	While reading the narrative, I had a vivid image of [character name]
(R) = Reversed-scored	

The narrative transportation scale has been applied to understanding how transportation may result in attitude and/or behavior change. Murphy, Frank, Chatterjee, and Baezconde-Garbanati (2013) conducted a study to further explore how theoretical constructs of

transportation, identification with specific characters or emotion may result in an increase in cervical cancer-related knowledge, attitudes and behavioral intent to be screened. Murphy et al. (2013) created two narratives (one fiction and one nonfiction) via film. Each film conveyed the same facts regarding the cause of cervical cancer as well as its prevention and detection. One film uses a narrative storyline in which family members discuss cervical cancer in a family narrative. In contrast, the other film uses a more didactic approach featuring a nonnarrative approach where local doctors and health experts and evidence provided through charts and figures. Transportation and identification with characters were measured using Brock and Green's (2000) Transportation Scale. Murphy et al. (2013) noted changes in knowledge where viewers of the narrative-based film learned significantly more than viewers of the nonnarrative film. A similar observation was noted with changes in attitudes. The authors did not find any race/ethnicity or interaction effects for either knowledge or attitude change. The authors experienced a ceiling effect when analyzing data related to behavioral intent to change. Still, the authors did note Mexican American and African American women had more definite intentions to get screened if they viewed the narrative film. Nevertheless, European Americans had more definite intentions to get screened if they viewed the nonnarrative film. The authors noted that although these effect sizes are relatively small, they are nonetheless encouraging for the use of narrative in health communication. Even small effect sizes may have a substantive impact on public health when they reach a large number of people due to mass media interventions (Murphy et al., 2013).

Mexican American women were significantly more transported by the narrative than European Americans. The level of transportation was, in turn, related to knowledge gain. Among viewers of the narrative film, after controlling for pretest levels of knowledge and race/ethnicity,

transportation was the theoretical construct most predictive of increased knowledge. Mexican American respondents were significantly more likely than their European American counterparts to identify with the main characters of the narrative film. This supports previous research that argues that individuals attend more closely to and model those whom they perceive as being similar to them. The results from their study elicited the following recommendations for future research:

- Communication researchers must remember that few among us possess Mark Twain's narrative ability and reach out to professional storytellers, cinematographers, directors, and so forth, to create quality narratives into which audience members can be transported
- Effective narratives should also feature characters with whom the target audience can identify
- The use of personal stories can enhance attention, engagement and behavioral intent. (Murphy et al., 2013)

Along with these factors, there are several implications that narrative communications can have on message effectiveness, considering target audiences and forms of narrative communication used. Narrative transportation theory is a promising theoretical framework that may uncover the underpinnings of how stories may be a useful tool in health and risk messaging. In addition, it has not been used in the evaluation of online public health campaigns that utilize a narrative communication approach. This study will use this theoretical framework to understand how transportation occurs in online public health campaigns that utilize storytelling as a method to convey a health message containing risk information.

Summary

This literature review has concluded that breast cancer is a substantial public health problem, particularly in women aged 45 years and younger. The subpopulations at higher risk, including minorities and those experiencing additional health disparities, could benefit from further education and messaging that focus on risk reduction behaviors and preventive

screenings. The opportunity to educate college-aged women in breast cancer risk is critical in averting later diagnosis in later adulthood. Online public health campaigns have become a popular way to disseminate public health messages to a broader audience. As such, it is essential to evaluate these campaigns to better understand their relative impact.

This review of the literature revealed that there is no gold standard for evaluating such campaigns; however, many evaluators have recommended a mixed-methods approach. Narrative transportation theory has not been utilized in the evaluation of online public health campaigns. Still, the opportunities for a greater understanding of how narrative approaches are impactful are endless. This study will employ a mixed-methods approach and will utilize the narrative transportation theory to understand how stories may encourage an attitude and/or behavior change.

CHAPTER 3

METHODOLOGY

This chapter will provide an overview of the Bring Your Brave (BYB) campaign context, including findings from previous formative evaluations of the BYB campaign. This chapter provides an overview of the Culturally Responsive Evaluation approach used in this evaluation and its overlap with the Centers for Disease Control and Prevention's (CDC) Evaluation Framework. This chapter reiterates the purpose of the evaluation, provide a rationale for a mixed-methods design used for the evaluation, and outline the methods for this evaluation. This will be followed by an overview of study procedures, including data management and analysis, and a description of how research quality was established. The chapter will conclude with a discussion on ethical considerations and researcher subjectivities.

Study Context: Bring Your Brave Campaign

The CDC launched the Bring Your Brave (BYB) online public health campaign in 2015 to provide information about breast cancer to young women. The campaign's target audience is women ages 18-44, specifically those women whose family history and backgrounds predispose them to a higher risk for breast cancer at a young age (CDC, 2019). This includes women with a family history of breast or ovarian cancer and women of African American and Ashkenazi Jewish ancestry. The BYB campaign has four main goals:

- 1) Encourage young women to learn their family history of breast and ovarian cancer.
- 2) Educate young women on the risk factors for breast cancer before the age of 45.

3) Inspire young women to talk to their health care provider if they think they may be at a higher risk for breast cancer.

4) Encourage young women to live a healthy lifestyle and be aware of their breast health.

(CDC, 2019)

The campaign uses real women to share their experiences about how their lives have been affected by breast cancer. These stories are found on the BYB website and social media sites, such as Facebook, Instagram, and Tumblr, in the form of recorded videos and podcasts (Figures 1 & 2). The young women's stories of breast cancer prevention, risk, family history, and survivorship bring to life the notion that women under age 45 can be personally affected by breast cancer.

Figure 1

Bring Your Brave Campaign Website

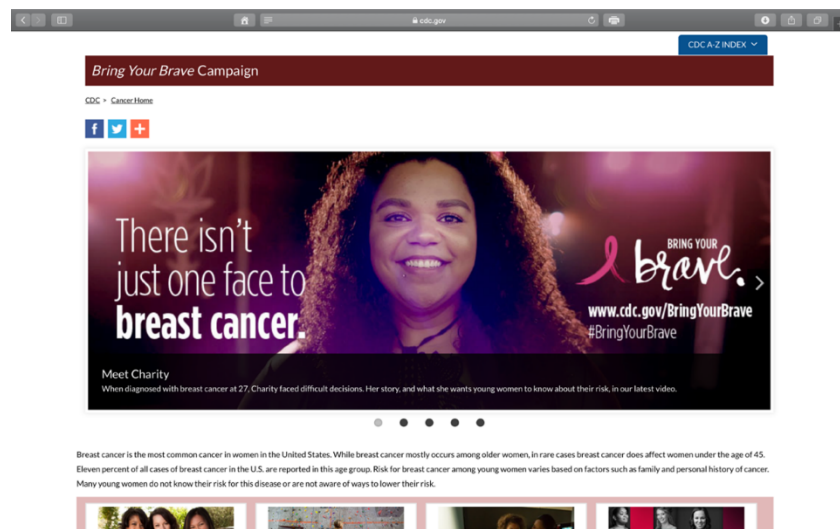
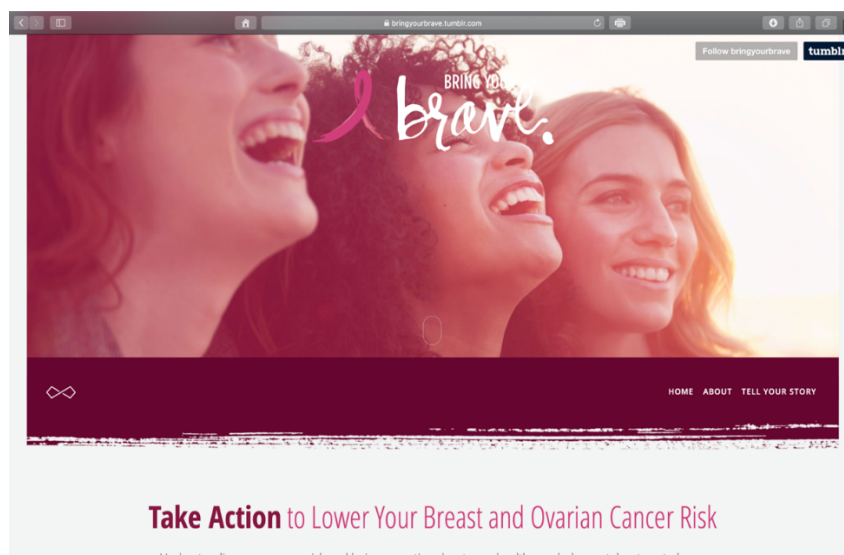


Figure 2*Bring Your Brave Campaign Tumblr Site*

Previous Formative Evaluation Research

The design of the current evaluation study began with a thorough review of previous data reports and documents in 2018. Prior to the development of the BYB campaign, an environmental scan was conducted to garner core insights to shape BYB into a credible and distinct social and digital media education campaign about breast cancer that effectively reaches young women under 45. The environmental scan consisted of a review of current literature, key informant interviews, document reviews of relevant evaluation reports from young breast cancer survivor programs, and an analysis of social media conversations to assess how breast cancer was being informally discussed. Findings suggested that the BYB was missing a key part of the target audience: women aged 18-24 or more specifically, college-aged women.

In 2017, BYB developers contracted an evaluation consultant to conduct an updated literature review of peer-reviewed manuscripts and journal articles relevant to health communication, marketing, and media campaigns about breast cancer in young women. The findings of this literature review led to a better understanding of barriers and motivations to risk

assessment, online health information-seeking behavior, audience-specific health communication, and healthcare provider education. Also, the evaluation consultant conducted a follow-up social media scan to update data on how young women were discussing breast cancer online. One interesting finding from this social media scan was that when women tell their personal stories of breast cancer online, this often leads to continued conversations among the storyteller and social media users. The evaluation consultant conducted a materials audit in 2017 to ensure 2014 BYB materials were relevant in 2017. One interesting finding from this audit was that prevention messages were consistent with 2014 messages. In this update, college-aged women were still an audience that appeared to be absent in the BYB campaign in 2017.

More recently, in 2018, BYB evaluation consultants conducted a formative evaluation to engage focus groups for feedback on BYB materials. The composition of focus groups reflected women of the BYB target audience: women aged under 45, African American, Ashkenazi Jewish ancestry, women with and without a family history of breast or ovarian cancer, and the general public. However, there were very few college-aged women in the focus groups. Focus group discussions provided evaluation consultants with actual dialogue and character descriptions that were incorporated into the women's stories to ensure that it would be relevant to the target audience. In addition, these discussions provided insight into whether the BYB campaign materials were effective in communicating key concepts. Specifically, whether or not the campaign materials under development will motivate women, those with average risk and those with increased risk of developing breast cancer, to respond to the calls to action and engage with activities promoted by campaign messages and the digital stories (Reynolds, 2018). Collectively, the information presented from 2014 to 2018 led to the current BYB campaign, including the refinement and development of new, targeted, and more culturally appropriate BYB materials

(Reynolds, 2018). In addition, data from the formative evaluations were used to develop additional health messages in the form of infographics (Figure 3). These tailored messages are used in the current BYB campaign to suit the target audiences' preferences and educational needs. This evaluation exclusively includes college-aged women who represent the target audience.

Figure 3

Bring Your Brave Infographics



Data from these formative evaluations informed the current evaluation by providing some additional context of the BYB campaign and unveiling previous gaps in determining overall effectiveness of the campaign. In addition, data from previous evaluations elevated the importance and benefit of ensuring cultural responsiveness in the current evaluation.

Bring Your Brave Logic Model

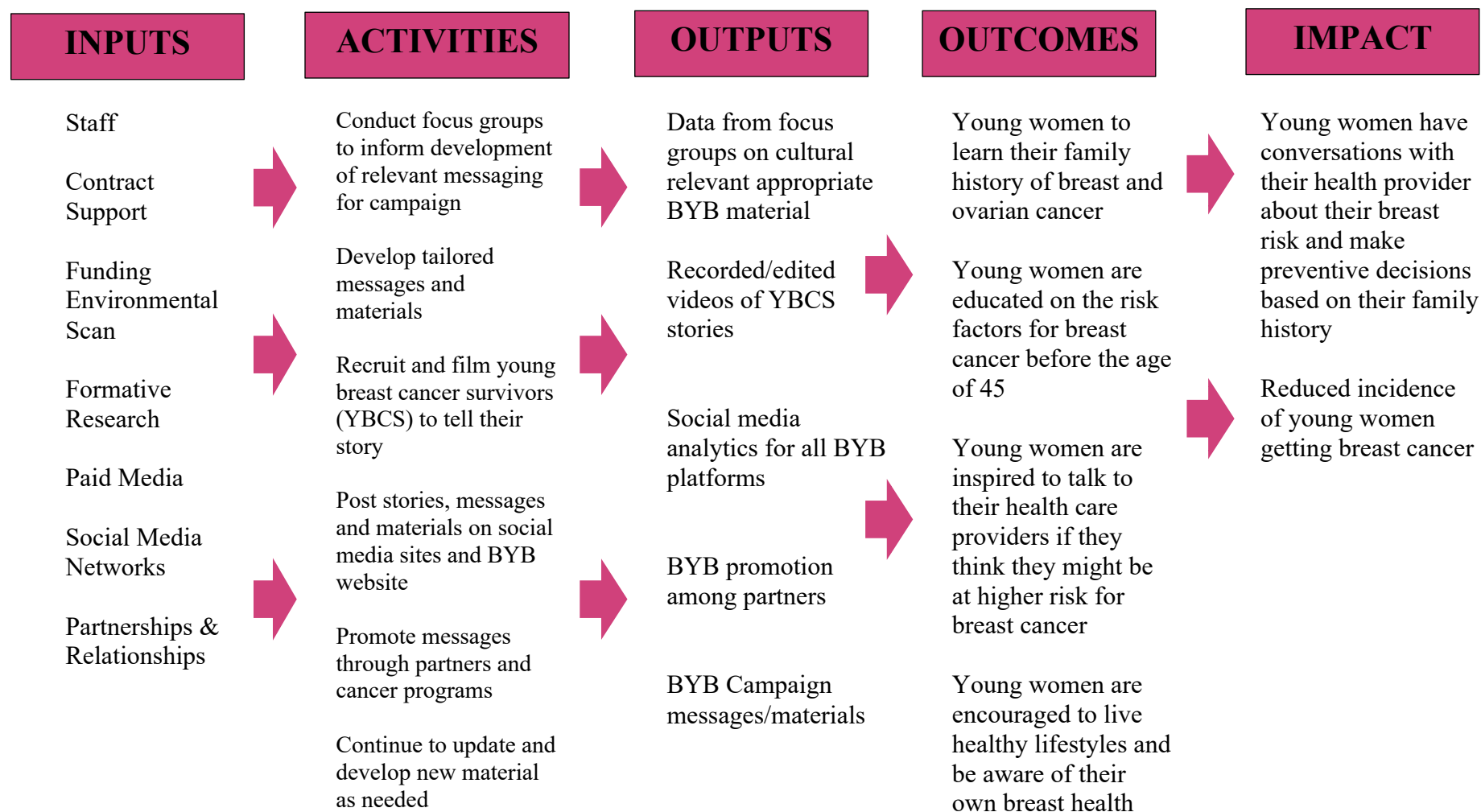
Logic models are often used as an evaluation planning tool to better understand the mechanisms by which a program, or in this case campaign, is expected to achieve its desired outcomes. The inputs are the resources needed and available to implement the activities outlined within the logic model. Outputs are the actual deliverables observed after the activities have been implemented. Together with the outputs, the implementation of activities is expected to lead to the outcomes depicted in the logic model. These outcomes are typically denoted as short,

intermediate, or long term; however, given the continuous nature of the campaign, outcomes are noted here without any time designation. Over time, after outcomes are observed, the relative impact listed in the logic model should also be expected.

A logic model (Figure 4) for the BYB campaign was developed in 2018 for this evaluation and was vetted through the campaign developers. As it currently exists, BYB inputs, activities, outputs, outcomes, and impact were inserted into the logic model to provide a high-level overview of the campaign. Given that the BYB campaign is continuous, it is understood that the logic model may need to be updated as new activities and/or outcomes arise. While the campaign developers noted that they did not utilize a specific theory for the development of the campaign, the logic model highlights underlying assumptions and the inherent theoretical framework of the campaign (Huhman, Heitzler & Wong, 2004). This logic model was reviewed and revised in 2019 to reflect activities and outcomes of the overall campaign. The logic model utilized in this evaluation to determine if the campaign met short-term outcomes using a culturally responsive approach.



Figure 4
Campaign Logic Model



Culturally Responsive Evaluation (CRE) Approach

The Culturally Responsive Evaluation (CRE) approach guided the design of this evaluation to better understand the extent to which the BYB campaign met its intended outcomes within a subset of its target audience. CRE is defined as “an evaluation approach that places culture and the community of focus at the center of the evaluation, helps to support community empowerment, and has a goal of social justice” (Frey, 2018). Evaluators implementing CRE approaches ensure each step of the evaluation is culturally responsive and incorporates the cultural voice of the evaluand in its design and implementation. An underlying assumption of CRE approaches is the focus on culture within the overall context of the evaluation, inclusive of program and community contexts as well as evaluation methodologies and methods (Chouinard & Cram, 2020). Patton (2015) notes,

Cultural competence is a stance taken toward culture, not a discrete status or simple mastery of particular knowledge and skills. A culturally competent evaluator is prepared to engage with diverse segments of communities to include cultural and contextual dimensions important to the evaluation. Culturally competent evaluators respect the cultures represented in the evaluation.

Evaluators must understand the cultural context and recognize its importance in every aspect of the evaluation. Often times, it involves building a rapport with the target audience to establish relationships that are beneficial to a better understanding of cultural underpinnings that may not be available in the literature. These extra steps help ensure the evaluation respects and honor the culture of the evaluand and promote a culturally responsive evaluation. Table 3 highlights some of these additional steps that differentiate traditional evaluation and culturally responsive evaluation approaches.

Table 3*Comparison of Traditional Evaluation vs. Culturally Responsive Evaluation*

Traditional Evaluation	Culturally Responsive Evaluation
EVALUATOR: Formally trained evaluators are the experts.	Grantees, community members know best their issues and strengths.
ROLE OF EVALUATOR: Leader, judge, expert	Facilitator, translator, convener
DESIGN & PLANNING: Evaluator presents design for funder approval.	Prioritizing rapport and trust building in an inclusive planning process that infuses multiple world views .
DATA COLLECTION: Conducted by evaluation professional	Facilitated by evaluator; stakeholders trained in some collection methods and implement them.
ANALYSIS: Results and their meaning are analyzed by evaluator	Results and their meaning are derived based on culture and system analysis .
REPORTING: Written report & briefing to funder	Disseminated to broader community.
APPLICATION OF FINDINGS: Findings used as monitoring, judging device.	Findings used to build capacity of community and community organizations .

Table developed by Hanh Cao Yu for the Foundation Resource Guide on Commissioning Multicultural Evaluation (<http://www.gmnstight.org/learning-with-diverse-communities-through-culturally-responsive-evaluation/>)

The BYB campaign is aimed towards young women aged 18-44 with a particular emphasis on women of African American and Ashkenazi Jewish ancestry. Women of both African American and Ashkenazi Jewish ancestry have different cultural traditions and underpinnings that may influence how they experience the campaign. To ensure cultural needs are incorporated within the evaluation, it is imperative to be culturally responsive at every step within this approach. CRE involves a detailed nine-step process that involves:

1. Preparing for the evaluation.
2. Engaging stakeholders.
3. Identifying evaluation purpose(s).
4. Framing the right questions.
5. Designing the evaluation.
6. Selecting and adapting instrumentation.
7. Collecting the data.
8. Analyzing the data.

Disseminating and using the results. (Hood, Hopson & Kirkhart, 2015)

Given that the BYB campaign focuses on a distinct target population with varying cultural differences, empowerment and societal transformative underpinnings, CRE was deemed the most appropriate approach for this evaluation. As such, each of the nine CRE steps were utilized in the evaluation.

Incorporation of the CDC Evaluation Framework

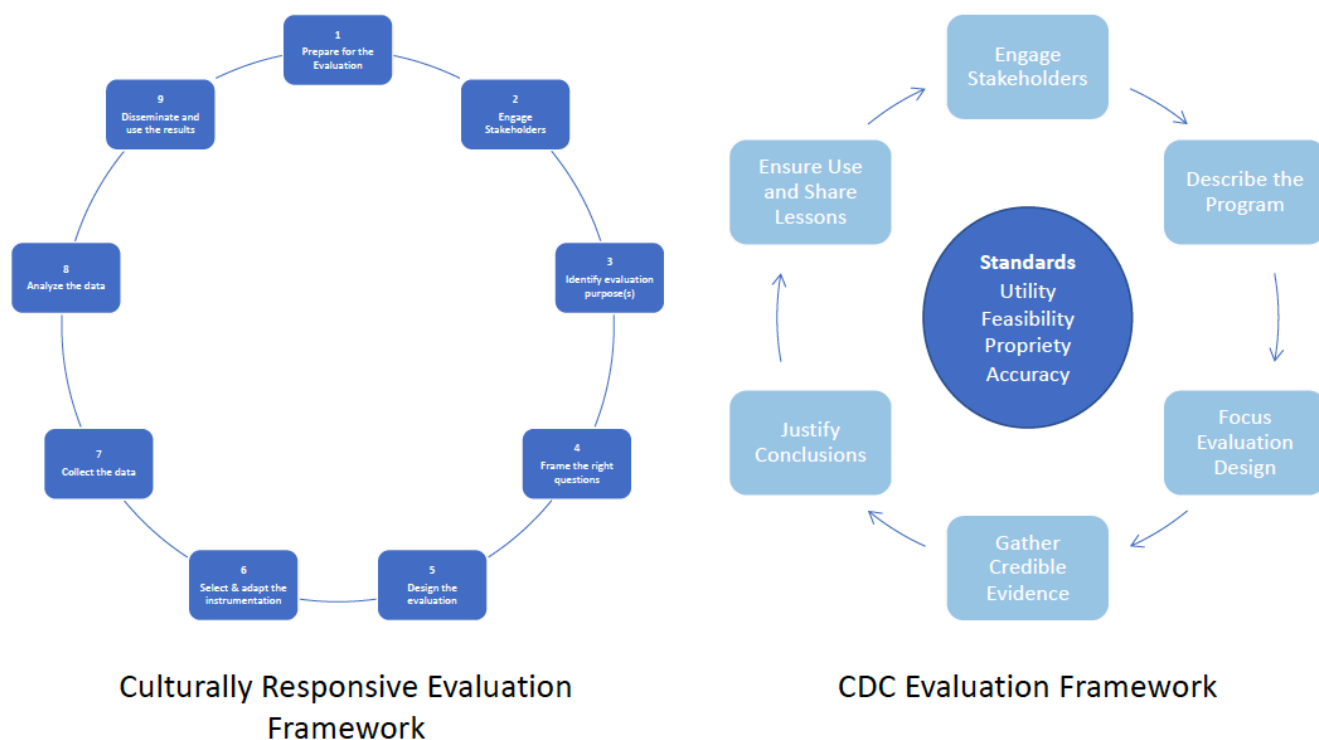
CDC strongly recommends that CDC-based programs and campaigns are evaluated using the CDC Evaluation Framework. To accommodate this recommendation, this evaluation embedded the six steps of the CDC Evaluation Framework within the CRE approach. The purposes of the CDC framework are to:

- Summarize the essential elements of program evaluation
- Provide a framework for conducting effective program evaluations
- Clarify steps in program evaluation
- Review standards for effective program evaluation
- Address misconceptions regarding the purposes and methods of program evaluation (CDC, 1999)

The CDC evaluation framework is embedded within the CRE approach; however, CRE adds an additional element that places a high value on cultural responsiveness. The CRE approach covers all six steps of the CDC Evaluation Framework, and its standards are inherent in the CRE design. By implementing the CRE design, this evaluation incorporated the six evaluation steps of the CDC Evaluation Framework in its design. A visual depiction of these two frameworks appears in Figure 5.

Figure 5

Parallel of the CRE Framework and CDC Evaluation Framework



Adapted from Hood, Hopson & Kirkhart (2015) & CDC (1999)

The following sections incorporate the CDC Evaluation Framework within the nine steps of the CRE approach to conducting the evaluation of the BYB campaign. The first eight steps will be highlighted in this Chapter, and Chapter 5 will cover step 9.

Step 1: Prepare for the Evaluation

In preparation for this evaluation, campaign documents from the beginning of its inception were acquired and reviewed. Also, the researcher held discussions with campaign developers, organizers, and evaluation consultants to facilitate a more in-depth understanding the context of the campaign. Given the researcher's current work in cancer prevention and control, more specifically, leading an evaluation of a cooperative agreement that focuses on providing support services and promoting health communication messages for young breast cancer survivors, the researcher was afforded the opportunity to interface with young breast cancer survivors and those considered as experts in the field of breast cancer in young women. These interactions with the community also included communications with organizations focused on African American and Ashkenazi Jewish young breast cancer survivors. In addition, the researcher attended numerous breast cancer-related conferences and site visits to breast cancer organizations to obtain firsthand context on the challenges faced within young breast cancer survivors. The researcher listened to stories of these young women, many of which were of college age, detailing their experiences leading up to their breast cancer diagnoses. These experiences enhanced the researcher's understanding of cultural challenges and nuisances faced in this population that may or may not be expressed in the literature.

Step 2: Engage Stakeholders

The second step in a CRE approach is to engage stakeholders. Stakeholders are the people or organizations that are invested in the program and the results of the evaluation. These individuals are vested in the evaluation as the results of this evaluation can be used in the improvement of future BYB campaign materials as well as inform future funding and/or policy decisions.

The primary stakeholders in this evaluation include the BYB campaign developers, staff, and funders. Secondary stakeholders in this evaluation include the CDC Division of Cancer Prevention and Control (DCPC) leadership and DCPC evaluators. Both primary and secondary evaluation stakeholders are interested in the impact of the BYB campaign and effective evaluation methods for evaluating future online public health campaigns. Tertiary evaluation stakeholders include breast cancer organizations that provide psychosocial support and resources to young breast cancer survivors, young breast cancer survivors, and their families/caregivers. Primary and secondary stakeholders provided important contextual history and background of the BYB campaign, critical feedback on evaluation questions, and advice as subject matter experts of the campaign. Tertiary stakeholders provided a voice for young breast cancer survivors and the target audience of the campaign. Tertiary evaluation stakeholders provided insight into potential gaps in messages for the study target population. All stakeholders were engaged throughout each stage of the evaluation to provide insight into the design of the evaluation, determine key evaluation questions, and determine how the results will be used and disseminated.

Step 3: Identify the Purposes and Intent of the Evaluation

This CRE has three purposes. The first is to understand the unique experiences of college-aged women's exposure to CDC's BYB public health campaign. As noted previously, college-aged women are a key audience for the campaign as they are at a critical age in which they may adopt healthy behaviors that may lower their risk of breast cancer. Previous formative research of the BYB campaign found that college-aged females were low users of the BYB campaign (Sapsis, 2015). The current evaluation further explored the reasons why college women are not engaging with the campaign as much as their older counterparts. The study

sought to include college students that were culturally representative of the BYB target audience to ensure cultural responsiveness. As such, recruitment focused on the attainment of women of African American and Ashkenazi Jewish ancestry.

The second purpose of this evaluation was to investigate how the use of the narrative transportation scale can be used to evaluate the effectiveness of the digital video stories and podcasts in the BYB campaign. Further, this CRE sought to determine how transportation may or may not influence behavioral change. Women of different ethnicities and cultures in the BYB campaign were used in the evaluation of narrative transportation. Research has demonstrated that users experience higher degrees of narrative transportation when there is a cultural resonance with the storyteller. This evaluation used a myriad of stories that reflected the target population to ensure users had an equal opportunity to experience narrative transportation.

The third purpose of this evaluation was to study and/or improve upon previous efforts in the evaluation of online public health campaigns by employing a mixed-methods culturally responsive evaluation design. This design includes a quantitative knowledge assessment before and after exposure to the BYB campaign and a qualitative focus group to better understand how increases in knowledge and narrative transportation occur in response to narratives in the BYB campaign. This novel methodology was evaluated to determine if online public health campaigns that utilize storytelling to convey health messages can be an effective method for evaluating future campaigns. Cultural responsiveness was incorporated in each step of the evaluation to ensure differences in culture were recognized and honored.

Step 4: Frame the Questions

In alignment with the CRE approach, evaluation questions were discussed in detail with all evaluation stakeholders of this campaign. Evaluation stakeholders expressed the desire to

understand why college women were not engaging with campaign materials and determine ways campaign materials could be more appealing to the audience. Previous formative research of women within the college-age revealed that resonance was a large facilitator of continued engagement with the campaign (Reynolds, 2018). One of the main objectives of the BYB campaign is to increase awareness among young women about their breast cancer risk through digital stories, podcasts, and infographic material. Baseline knowledge of breast cancer risk is assumed with this population and has not been thoroughly assessed to determine if messaging is at a level of health literacy that resonates with this population. As such, there were two questions that focused on baseline knowledge and knowledge attainment after exposure to the campaign, and if there was any correlation between demographic variables and knowledge of breast cancer risk and prevention behaviors.

Given that research suggests a positive association with high narrative transportation scores and behavior change (Green and Brock, 2000), an evaluation question was developed to better understand how narrative transportation is experienced in college women and its potential for behavior change. A follow-up evaluation question further explored how these experiences provided more understanding of the strengths and limitations of the BYB campaign for this population. The final evaluation question assessed the novel methodology used in this evaluation and its recommendations for future use in campaigns that utilize digital stories as a tool to convey health messages. The five evaluation questions are listed below:

1. How does knowledge of breast cancer risk and prevention correlate with variables of age, race, current year in school, smoking status, alcohol consumption, self-reported health status, genetic testing, family cancer history of an extended family member among college women?
2. How does exposure to the Bring Your Brave campaign correlate with increases in knowledge of breast cancer risk factors and breast cancer prevention?

3. How do college-aged women experience narrative transportation in response to viewing or listening to Bring Your Brave campaign stories?
4. What do these experiences tell us about the strengths and limitations of the form and content of the BYB campaign messaging strategies?
5. To what extent is a mixed-method design, including the use of narrative transportation theory within focus groups, effective in the evaluation of online public health campaigns that utilize storytelling to convey health and risk messages?

Step 5: Design the Evaluation

For this evaluation, multiple methods were needed to understand the phenomenon that occurs within the context of each evaluation question. Thus, mixing methods for the current evaluation was justified as it allowed for different data to converge, complement, or extend each other, allowing “a richer, more analytically dense, more complete and confidently argued response to their [my] research questions” (Bazeley, 2018). Accordingly, a multiphase mixed methods design was used to evaluate the BYB Campaign (DeCuir & Schutz, 2017). Approval for the evaluation study was obtained from the University of Georgia’s (UGA) IRB (Appendix A).

Recruitment and Participants

As mentioned previously, evaluation stakeholders expressed a desire to understand why college women were not engaging with campaign materials. Further, evaluation stakeholders desired to determine how campaign materials could be more appealing to the audience. Therefore, to better understand any disparities among college-age women of varying races and ethnicities, women from multiple sororities were recruited at the University of Georgia via email. Emails were sent to sorority presidents, executive boards, and general members based on those listed in the UGA Greek Life website or on the respective sorority's social media page. The email invitation (Appendix B) was comprised of a brief description of the study and language from the informed consent outlining the benefits and risks to participation. The email also noted the desire to conduct the focus groups with the sorority members in the Tate Center (a central meeting place on campus) or as part of an existing event or meeting to eliminate some inconvenience of travel for the participants. If the sorority president or member agreed to participate, the participant was scheduled for one of 6 focus groups and were paired with other members of their respective sororities. Each participant was compensated with a \$15 Amazon gift e-card for their participation.

Targeting sororities was beneficial to provide a wealth of information on college women's health issues. Sororities operate as a mini community committed to the notion of sisterhood; therefore, a safe environment was created, which enabled the women to share insight on sensitive topics such as cancer in a focus group setting. Furthermore, sororities represent an understudied group of women that are at a prime age for modifying health behaviors to reduce breast cancer risk.

Participants were current undergraduate students who identified as female at the University of Georgia and were at least 18 years of age. Table 4 provides a brief description of the participant inclusion and exclusion criteria and characteristics. These recruitment criteria allowed for a diverse sample of focus group participants that culturally reflected the target audience of the BYB campaign. In total, the evaluation study included one focus group per sorority for a total of 6 focus groups. One to six women were included in each of the focus groups for a total of 24 women.

Table 4

Participant Criteria and Characteristics

<i>Inclusion Criteria</i>	<i>Exclusion Criteria</i>	<i>Within group characteristics</i>
• Female gender • Current UGA undergraduate student • At least 18 years or older • Member of a sorority/Greek organization	• Nonfemale gender • Under 18 years of age	Focus group participants had a mix of heterogenous characteristics including: • Education level • Family history of cancer • Membership in a sorority/Greek organization • Age • Ethnicity

Study Participant Demographic Characteristics

Twenty-four females enrolled at the University of Georgia participated in the study. Each participant completed the pre- and post-assessments, narrative transportation scale assessment, and the focus group interviews. The average age of the participants was 20.3 years. The majority

of the participants were classified as juniors in college (41.7%), followed by seniors (33.3%), sophomores (20.8%), and freshmen (4.2%). African American females accounted for 50% of the participant sample followed by Caucasian females (45.8%), Ashkenazi (Eastern European) Jewish Ancestry (20.8%), and Asian/Pacific Islander (4.2%). American Indian/Alaska Native, Hispanic and Other categories were selected in addition to the race and ethnicity variables. Fifty percent of the study participants reported having a family history of cancer. Demographic characteristics are represented in Table 5.

Table 5*Demographic Characteristics of Study Participants (n=24)*

Baseline Characteristic		
	n	%
Age		
18	1	4.1
19	3	12.5
20	12	50.0
21	4	16.7
22	4	16.7
Gender		
Female	24	100
Male	-	-
Race/Ethnicity		
African American	12	32.0
American Indian/Alaska Native	1	3.0
Asian/ Pacific Islander	1	3.0
Caucasian/White	11	26.0
Hispanic/Latino	1	3.0
Ashkenazi (Eastern European) Jewish Ancestry	5	21.0
Bi-racial, Multi-racial	8	12.0
Current Year in School		
Freshman	1	4.2
Sophomore	5	20.8
Junior	10	41.7
Senior	8	33.3
BMI		
Below 18.5 (Underweight)	2	8.3
18.5 – 24.9 (Normal)	12	50.0
25-29.9 (Overweight)	5	20.8
30 and above (Obese)	5	20.8
Family History of Cancer		
Yes		
No		

Six focus groups were held and scheduled based on the participants' availability. Each focus group consisted of members from similar sororities with two focus groups having more than one sorority present. The sororities were comprised of similar races and ethnicities except for Focus C, which identified as a "multicultural" sorority. Table 6 displays the demographic characteristics of the study participants by focus group. There were two focus groups with only African American participants, two focus groups of participants of Ashkenazi Jewish ancestry, one focus group with all Caucasian participants, and one focus group of multiple ethnicities, including African American, Asian Pacific Islander, Caucasian, or Biracial (including Hispanic). Each focus group had at least one participant who reported having a family history of cancer. Focus Group E originally had four members scheduled; however, only one participant appeared for the focus group session.

Table 6*Focus Group Distributions (n=24)*

Focus Group	Number of Participants	Average age	Race/Ethnicity	Current Year in School	Family History of Cancer
A	4	20.5	100% African American	25% Seniors 75% Juniors	50%
B	3	21.7	100% Caucasian	100% Seniors	67%
C	5	20.4	40% African American 20% Asian Pacific Islander 40% Caucasian 20% Biracial	40% Seniors 60% Juniors	40%
D	6	20	100% African American	17% Seniors 50% Juniors 33% Sophomores	33%
E	1	20	Ashkenazi Jewish Ancestry	Sophomore	100%
F	5	19.8	100% Ashkenazi Jewish Ancestry	20% Seniors 20% Juniors 40% Sophomores 20% Freshmen	60%

Step 6: Selecting and Adapting Instrumentation

The focus group protocol and pre- and post-assessments were developed, and pilot tested to ensure the questions were clear, coherent, and culturally responsive for the target audience. A small group of four college-aged women participated in the pilot focus group. Results from the

pilot testing helped to refine the focus group questions to ensure they captured accurate information. For example, the focus group question was changed from “How do you feel participating in this focus group among your sorority sisters?” to “How do you feel about discussing breast cancer with your sorority sisters within this focus group setting?”. There was minimal feedback on the additional focus group questions as they were tested during previous BYB formative research.

Green and Brock’s (2000) narrative Transportation Scale is the standard instrument used to capture the experience of narrative transportation while reading, viewing or listening to a story (Green & Brock, 2000). The scale was created with the intent to capture the significant dimension of Gerrig’s (1993) exposition of transportation, including emotional involvement in the story, cognitive attention to the story, feelings of suspense, lack of awareness of surroundings, and mental imagery (Green and Fitzgerald, 2017). The original scale includes 15 items, including 11 general transportation items and four imagery items all relating to a specific narrative (Table 2). An example of the instrument is also found in Appendix E. Because the scale was initially developed to capture transportation through written stories, it was adapted to denote videos and podcasts. The remaining aspects of the narrative transportation scale remained unchanged. The narrative transportation scale has been validated in the literature for written, audio, and visual stories. It has a Cronbach alpha reliability coefficient of 0.76 (Appel et al., 2015).

Champion’s Health Belief Model for breast cancer screening behaviors scale (Champion, 1993) was included in the pre-assessment to assess pre-test attitudes related to participant’s perceived susceptibility and perceived severity of breast cancer. This scale has been validated in the literature and has a Cronbach alpha reliability coefficient from 0.80 to 0.93 (Champion,

1993). The items from the Champion's Health Belief Model (Table 7) were unchanged for this study.

Table 7

Champion's Health Belief Model for Breast Cancer Screening Behaviors

Champion's Health Belief Model Items
<i>Perceived Susceptibility</i> • It is extremely likely I will get breast cancer in the future • I feel like I will get breast cancer in the future • There is a good possibility I will get breast cancer in the next 10 years • My chances of getting breast cancer are great • I am more likely than the average woman to get breast cancer <i>Perceived Severity</i> • The thought of breast cancer scares me • Problems I would experience with breast cancer would last a long time • if I had breast cancer my whole life would change

Step 7: Collect the Data

The following section describes the survey, narrative transportation scale, and focus group data collection that occurred. Additional information may be found in the Appendices and will be referenced in its respective section. There are three primary sources of data for this evaluation: focus group data, pre- and post-assessments, which include the Champion Health Belief Model scale and knowledge questions, and the narrative transportation scale assessments for each video and podcast. These data sources were used to answer the evaluation questions highlighted earlier in this chapter. Table 8 outlines the data source that was used to answer each corresponding evaluation question. A detailed description of the analysis for each data source is described below.

Table 8*Evaluation Questions and Sources of Data*

Evaluation Question	Source of Data		
	Focus Group Data	Knowledge Assessment	Narrative Transportation Scale
Evaluation Question 1: How does knowledge of breast cancer risk and prevention correlate with variables of age, race, current year in school, smoking status, alcohol consumption, self-reported health status, genetic testing, family cancer history of an extended family member among college women?	X	X	
Evaluation Question 2: How does exposure to the Bring Your Brave campaign correlate with increases in knowledge in breast cancer risk factors and breast cancer prevention?	X	X	
Evaluation Question 3: How do college aged women experience narrative transportation in response to viewing or listening to Bring Your Brave campaign stories?	X		X
Evaluation Question 4: What do these experiences tell us about the strengths and limitations of the form and content of the BYB campaign messaging strategies?	X	X	X
Evaluation Question 5: To what extent is a mixed method design, including the use of narrative transportation theory within focus groups, effective in the evaluation of online public health campaigns that utilize storytelling to convey health and risk messages?	X	X	X

Pre- and Post-Assessments. To assess any change in knowledge before and after exposure to the BYB campaign, quantitative pre- and post-knowledge assessment surveys (Appendix C & D) were used. As noted previously, survey assessments were pilot tested before data collection occurred.

Participants were asked to answer the demographic, health behavior, medical history, breast cancer attitude, and breast cancer knowledge questions via a paper survey prior to viewing any BYB material or engaging in the focus group. Demographic questions adapted from Justice et al. (2018), Lewis et al. (2018), Collins' (2014), and the National Health Interview Survey were included in the assessment. These demographic questions inquired about participants' sex, race, age, and personal breast cancer experience of an extended family member. Health behavior questions were derived from the National Health Interview Survey and included questions that inquired about current physical activity, tobacco use, alcohol consumption, and participants' self-perceived health status. Medical history questions were derived from previous BYB formative research focus group questions, which included questions on family cancer history, history of genetic testing, age of first menarche, and details of most recent doctor's visit. As noted previously, breast cancer attitude items were derived from Champion's (1993) Health Belief Scale. Knowledge questions were comprised of true and false statements from the BYB materials.

Each participant completed the same knowledge assessment after exposure to the BYB videos, podcasts, and infographics to assess any change in knowledge. In addition, participants were asked three additional questions about their intent to engage or change preventive behavior after viewing the BYB materials. Both the pre- and post-assessments took approximately 10 minutes each to complete. Each participant's pre and post-survey was assigned a number to ensure the pre- and post- surveys correlated with the appropriate participant and to ensure confidentiality.

Narrative Transportation Scale. Each focus group was exposed to two BYB videos – Emily and Caroline and Jackie

(https://www.cdc.gov/cancer/breast/young_women/bringyourbrave/stories/index.htm) and one

BYB podcast – Megan

(https://www.cdc.gov/cancer/breast/young_women/bringyourbrave/stories/podcasts.htm). Each

video and podcast was approximately 2 minutes and 8 minutes, respectively, for a total of 12 minutes of viewing/listening.

Immediately following the viewing of two BYB videos and listening to one BYB podcast, the participants were also asked to complete a narrative transportation scale assessment. The scale took participants approximately 8-10 minutes to complete. Each transportation scale assessment was numbered to correlate with their respective pre and post-survey as well.

Focus Groups. After completing the narrative transportation scale for each story (two videos and one podcast), sorority members participated in a focus group discussion. Focus groups were conducted as opposed to one-on-one interviews as focus groups tend to provide a synergistic environment that encourages additional topics and information that may be missed in individual interviews (Crosby et al., 2006). To ensure each person in the focus group had an equal opportunity to speak, the researcher encouraged each person to participate in the discussion and used probes to further encourage participation. One of the benefits of using focus groups as opposed to individual interviews is the opportunity to observe cultural group dynamics (Hall, 2020). This was particularly of interest in this study as it sought to have the participants engage with each other in a more intimate, culturally responsive setting as sorority members.

After exposure to BYB materials, the focus group participants engaged in a discussion around the BYB campaign videos, podcast, and infographics immediately after exposure. Focus group participants shared their thoughts and reactions to the stories as it relates to understanding

breast cancer risks and their intent to engage in preventive breast cancer behavior after viewing and/or listening to the stories.

Due to the sensitive nature of the topic, focus groups were comprised of women within the same sororities and ethnicities to ensure participants felt comfortable with discussing breast cancer (Crosby et al., 2006). A total of six semi-structured focus group sessions were conducted, each comprised of approximately 1-6 women. There was one focus group with one individual as the three other scheduled participants did not appear to participate in the focus group.

Participants in each focus group were guided through a discussion of three stories from the BYB Campaign. A copy of the Focus Group Interview Guide is found in Appendix F. Each focus group lasted approximately 45-60 minutes and included the focus group participants and a moderator (researcher). Each focus group was audio recorded for later transcription and analysis. The researcher also took notes on group dynamics and body language during the focus group sessions. The focus groups were held at the Tate Center and Miller Learning Center (MLC) on the campus of the University of Georgia.

Step 8: Analyze the Data

Integrated mixed methods data analysis not only involves the analysis of a qualitative and a quantitative strand – but also entails an analysis of the interaction between the two strands. Through integration, the results have the potential to produce insights that would not be possible with a mere combination of data – let alone with mono-method research (Vogl, 2019). In this data analysis, qualitative and quantitative data were integrated to further explore aspects of the evaluation questions.

Pre- and post-knowledge assessments and Narrative Transportation Scale assessments were analyzed using SPSS (Onwuegbuzie & Combs, 2010). Descriptive statistics such as

frequencies, means, and standard deviations were calculated for demographic questions (sex, gender, age, etc.). Knowledge statements and the Narrative Transportation scale were summed, and a mean score was calculated. Chi-Square tests were used to determine significance between demographics such as sex, gender, and age, and knowledge mean scores. Independent t-tests were used to compare differences between focus groups, demographics and knowledge statements, and narrative transportation scale scores. Three narrative transportation statements were reversed coded based on the wording of the statements.

Focus group interviews were transcribed by the transcription company rev.com. Transcribed data were analyzed alongside observation notes constructed by the researcher and any notes extracted from debriefing. The transcripts of 6 focus groups were coded simultaneously by two coders, using thematic analysis. Prior to coding, an initial coding scheme was prepared in a codebook, based on the interview guide. After coding the first three focus groups, this coding scheme was revised and finalized, and all focus groups were coded with this final coding scheme. Intercooder reliability statistics were calculated using Atlas TI's intercoder agreement analysis. Disagreements among coders were discussed until unanimous agreement was reached. For coding and analyzing the transcripts of the focus groups, software for qualitative data analysis (Atlas.TI version 8.4.4) was used.

Data were stratified by focus group to denote any significant differences between focus groups (Onwuegbuzie et al., 2009). Diversity within groups was examined by disaggregating data to explore, for example, how programs may affect some community members differently than others. The existence of positive unintended outcomes can expand one's understanding of program benefits, while unintended negative outcomes suggest important caveats or cautions that must be considered to prevent harm.

Data integration is essential for mixed methods research. According to Bazeley (2018), without integration, questions are left unanswered and possibilities for deeper insights unexplored; in addition, inappropriate conclusions might be drawn. The integration of data was critical in understanding the transportation phenomenon as well as answering the proposed evaluation questions. Accordingly, the integration technique used for this study followed a narrative approach wherein both qualitative and quantitative findings were integrated within the narrative presented in Chapter 5 (DeCuir & Shutz, 2010). Using the narrative transportation theory as the foundation shaping the narrative, the qualitative data were used to supplement the quantitative results of the Transportation Scale assessment. Also, frequencies and results from the demographic and knowledge surveys provided insight into data trends or patterns observed within the results of the Transportation Scale assessment. Further, the qualitative results were used to better understand the participants' experiences of the BYB campaign in addition to the results of the Transportation Scale assessment.

Data Management

To ensure confidentiality was met, all participants were assigned participant numbers to protect their identity and to identify their survey. Prior to engaging in the study, participants signed an informed consent and were given a copy for their records (Appendix G). The informed consent assured participants that there were no identifiers linking their names/sororities to their surveys, and their responses are confidential. All recorded focus group discussions were transcribed, and all recordings and transcriptions will be deleted within six months of study completion. All interviews were stored on the study encrypted external drives, which are locked away in the researcher's office.

Establishing Research Quality

Quality is constructed and maintained continuously throughout the life of a research project. It includes decisions that researchers make as they interact with those they study and as they consider their analyses, interpretations, and representations of data (Freeman, 2007). Data were triangulated to better understand participants' narrative transportation experiences of the BYB campaign (Green, 2007) and to enhance data quality and credibility of research findings for this culturally responsive mixed-methods evaluation. This evaluation included three main data sources: pre- and post-assessments (quantitative), the narrative transportation scale (quantitative), and focus group discussions (qualitative). The inclusion of the qualitative component is a relatively new approach combined with the narrative transportation scale. This addition addresses quality by providing a more detailed description of the participants' experience and assigns meaning to their experiences of narrative transportation in response to the BYB campaign.

To reduce potential bias and enhance legitimization, the researcher journaled throughout every phase of the evaluation (Onwuegbuzie and Johnson, 2006). The entries in the journal reflected personal feelings and observances throughout the entire process in order to reflect on any potential biases during data analysis.

Ethical Considerations

Several ethical considerations arose within the context of this research. Due to the sensitive nature of the topic, there were instances in which participants became emotional when discussing personal experiences with breast cancer. During the focus group sessions, two participants started weeping in response to one of the focus group questions, and we had to pause the focus group session to console the affected participant. It was helpful to have a focus group

comprised of familiar faces among participants, as this helped in having the group comfort the affected participant.

Additionally, participants were assured confidentiality through the use of pseudonyms. Given that the participants were part of specific ethnic and cultural groups, this was essential. Furthermore, ensuring the evaluation was culturally responsive also played a significant role in ensuring confidentiality was upheld, and the respect of culture was maintained.

Subjectivities

For the majority of my life, I had set career aspirations of becoming a Pediatrician. That all changed after I lost my mom to breast cancer. My mom was diagnosed with stage 4 metastatic breast cancer, and in less than 1 year, she lost her battle. My mom lived a relatively healthy lifestyle; she exercised, consumed healthy foods, and managed stress well. After her diagnosis, I remembered my mom saying to me, “I don’t know how I got cancer, but if you can prevent yourself or anyone else from getting breast cancer, that would make me happy.” That was a conversation that had been on my mind ever since that night. I began to rethink my career in medicine to focus on these questions with a focus on how food and the environment affect cancer rates and survivorship. My passion for breast cancer survivorship is further evidenced in my full-time work at CDC. I recognize my position in the research and hope to leverage my passion, professional, and personal experiences with breast cancer as a way to build rapport among study participants. I lost my mother to metastatic breast cancer almost 11 years ago. My passion for breast cancer prevention is apparent. Through these experiences, I have come to recognize and understand the culture of young breast cancer survivorship and caregivers. From this perspective, I can relate to those featured in the campaign as well as the target audience of the campaign. It is through this understanding that I recognized the importance of being culturally responsive in this

evaluation. I journaled my experience to ensure I can observe any unintentional biases in my interviewing, analysis, and conclusions.

Summary

As noted previously, there is currently no gold standard for the evaluation of public health campaigns, and there is little research to demonstrate best practices for impact evaluations. This evaluation is novel in its mixed-method approach as it seeks to better understand the experiences of the users of the campaign through the use of the narrative transportation theory. The following chapter will highlight the results of the evaluation.

CHAPTER 4

RESULTS

This chapter presents the findings from the pre- and post-assessments, narrative transportation scale assessment, and focus group interviews used to evaluate the Bring Your Brave (BYB) health campaign. These findings are linked to the relevant literature in each section of findings. A description of findings related to the participants' health behaviors, perceived health status, and attitudes towards breast cancer and a brief review of the BYB videos (2), podcast (1), and infographics (2) are also presented. The final section of the chapter reports the findings for each evaluation question.

Health Behaviors of Participants

Participants were asked a series of health behavior questions to ascertain their current risk of breast cancer and its relation to their attitudes of breast cancer and subsequent breast cancer knowledge. The mean BMI for the study group was 26.2, which was a little higher than the national average of 25.1 (American College Health Association, 2020). The vast majority of participants had a BMI of a normal range (50%), followed by an equal representation of both overweight and obese BMI scores (20.8%), and 8.3% were considered underweight. BMI has a negative association on breast cancer risk in premenopausal women but has a positive association with breast cancer risk in postmenopausal women. Women with a familial risk of cancer can exacerbate this risk higher than those women without a familial risk. As such, it is imperative that young women maintain a healthy weight throughout their adult life to minimize their breast cancer risk (Hopper et al., 2018).

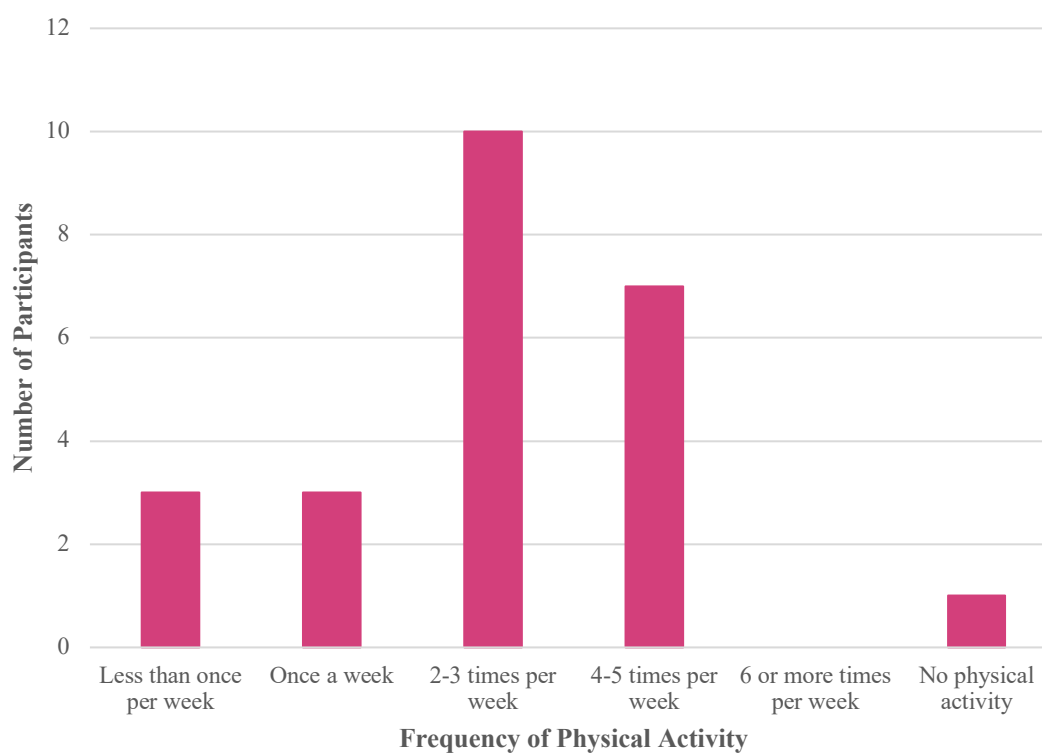
Physical Activity

A vast majority of the study participants (96%) reported engaging in physical activity. Most participants reported engaging in physical activity at least 2-3 times per week. Figure 6 displays the range of responses for the frequency of participants' current physical activity. Research has shown that physical activity, along with maintaining a healthy weight, can significantly reduce the risk of breast cancer, irrespective of the timing and intensity of the exercise (Hardefeldt et al., 2017). The U.S. Department of Health and Human Services (2018) recommends the following physical activity guidelines for adults ages 18-64:

- Adults should move more and sit less throughout the day. Some physical activity is better than none. Adults who sit less and do any amount of moderate-to-vigorous physical activity gain some health benefits.
- For substantial health benefits, adults should do at least 150 minutes (2 hours and 30 minutes) to 300 (5 hours) a week of moderate-intensity, or 75 minutes (1 hour and 15 minutes) to 150 minutes (2 hours and 30 minutes) a week of vigorous-intensity aerobic physical activity, or an equivalent combination of moderate- and vigorous-intensity aerobic activity. Preferably, aerobic activity should be spread throughout the week.
- Additional health benefits are gained by engaging in physical activity beyond the equivalent of 300 minutes (5 hours) of moderate-intensity physical activity a week.
- Adults should also do muscle-strengthening activities of moderate or greater intensity and that involve all major muscle groups on 2 or more days a week, as these activities provide additional health benefits.

Figure 6

Self-Reported Physical Activity Engagement Among Study Participants



Although research notes that there is a significant reduction in breast cancer risk with physical activity engagement (Guo et al., 2020), physical activity can have additional benefits to one's overall well-being. As the Department of Health and Human Services (2018) notes, those who engaged in at least 150 minutes of physical activity a week can experience substantial health benefits (Table 9).

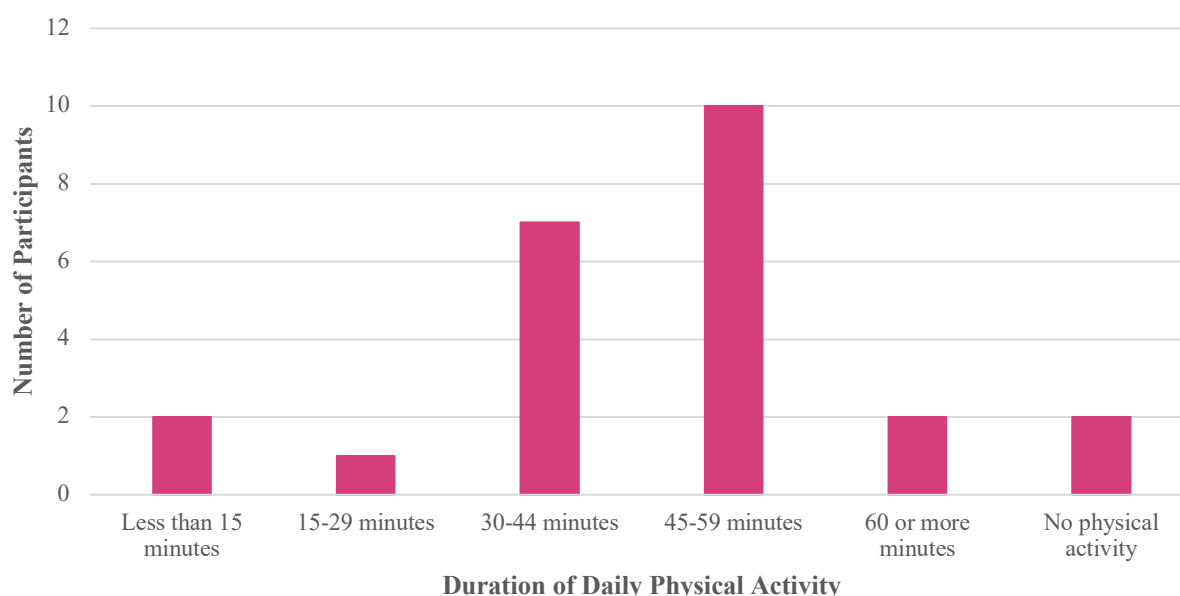
Table 9*Health Benefits Associated with Regular Physical Activity*

- Lower risk of all-cause mortality
- Lower risk of cardiovascular disease mortality
- Lower risk of cardiovascular disease (including heart disease and stroke)
- Lower risk of hypertension
- Lower risk of type 2 diabetes
- Lower risk of adverse blood lipid profile
- Lower risk of cancers of the bladder, breast, colon, endometrium, esophagus, kidney, lung and stomach
- Improved cognition
- Reduced risk of dementia (including Alzheimer's disease)
- Improved quality of life
- Reduced anxiety
- Reduced risk of depression
- Improved sleep
- Slowed or reduced weight gain
- Weight loss, particularly when combined with reduced calorie intake
- Prevention of weight regain following initial weight loss
- Improved bone health
- Improved physical function

While this study did not inquire about the intensity of physical activity, it is noted that majority of participants who engaged in weekly physical activity reported engaging in physical activity for at least 45-59 minutes (42%), followed by those who reported 30-44 minutes (29%) of physical activity. Figure 7 displays the duration of physical activity reported by study participants.

Figure 7

Self-Reported Duration of Exercise on a Typical Day



Tobacco Use

Only four percent of study participants identified themselves as a current smoker (including cigarettes, vapes, or hookah). Although smoking is not an established risk for breast cancer, recent studies have noted an association of increased breast cancer risk among women who initiated smoking before first childbirth (Gram et al., 2019). The American College Health Association (2020) recently reported the prevalence of tobacco or nicotine delivery products among college females. The most frequent product used was e-cigarettes or vapes (17.2%) followed by cigarettes (6.9%), water pipes or hookah (3.0%), cigars (2.0%), chewing or smokeless tobacco (0.4%) and other (0.2%). Recent data has shown that 40-60% of U.S. young adults aged 18-21 who use e-cigarettes never smoked cigarettes (Hiler et al., 2020). It is known that e-cigarettes are often a gateway to cigarette use. Among college students, reasons for this transition may include social influences, psychological coping, cigarette appeal, reinforcing

effects of cigarettes, sharing with others, accessibility, vaping stigma, and vaping deficiencies (Hiler et al., 2020). Initiating use of any tobacco product significantly increases one's breast cancer risk, particularly among college women who have not had their first child.

Alcohol Consumption

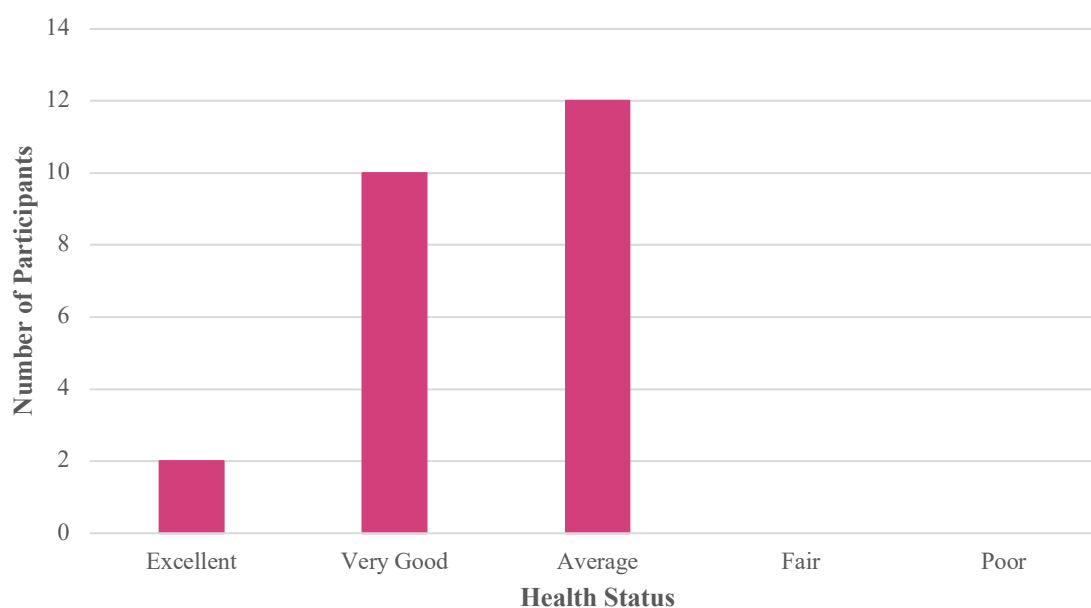
Approximately 74% of study participants reported consuming at least one drink of any alcoholic beverage (beer, wine, a malt beverage or liquor) in the past 30 days. Additionally, study participants reported an average of 1.7 drinks of any alcoholic beverages in a week during the past 30 days. The National Toxicology Program of the US Department of Health and Human Services identified the consumption of alcoholic beverages as a known human carcinogen (National Cancer Institute, 2020). Several research studies have reported an association of increased breast cancer risk with increased consumption of alcohol (Alimujiang & Colditz, 2019; Godinho-Mota et al., 2019 & Zeinomar et al., 2019). The risk is exacerbated with a sedentary lifestyle (Godinho-Mota et al., 2019), alcohol use (Khushalani et al., 2020), and combined tobacco use (National Cancer Institute, 2020). The Dietary Guidelines for Americans (2015-2020) recommends alcohol consumption (for those who drink alcohol) in moderation. For adult women, a limit of one drink (12 ounces of beer, 5 ounces of wine, or 1.5 ounces of 80 proof distilled spirits) per day is recommended. Approximately 10% of college females reported drinking alcohol within the last 30 days and reported the use of 4 or fewer drinks consumed the last time they consumed alcohol in a social setting (American College Health Association, 2020). Limiting alcohol consumption in young adulthood can reduce one's breast cancer risk along with healthy behaviors mentioned previously.

Perceived Health Status

Overall, half of the study participants perceived their health status as average (50%) followed by very good (41.7%) and excellent (8.3%). None of the participants reported their health as fair or poor (Figure 8). On a national level, 48.8% of college females described their health as very good or excellent, while 87.4% described their health as good, very good or excellent (American College Health Association, 2020).

Figure 8

Perceived Health Status of Study Participants



Medical History

Two main messages of the BYB campaign are implicated in knowing your family cancer history and talking to your healthcare provider about your breast cancer risk. While all women are at risk for developing breast cancer, having a familiar history of certain cancers can increase a young woman's risk of getting breast cancer (CDC, 2020). The BYB Campaign (2019) states that women under the age of 45 have a higher risk of breast cancer if one has a family history of

cancer and/or a BRCA gene mutation. Young women equipped with this knowledge are able to have meaningful conversations with their healthcare providers to assess their risk and determine modifiable behaviors that may reduce their risk. In addition to these factors, there are some additional medical factors that may influence one's risk. These include age at first menses and discussion of breast cancer risk with a healthcare provider and/or genetic counselor.

Family Cancer History

Fifty percent of participants reported having a family history of cancer. Family history was defined as the identification of at least one person in the participant's family with breast/ovarian cancer or other known cancer known to cause hereditary breast cancer. Participant response options are presented in Table 10. There was almost equal distribution among those participants who reported either "I don't know" or "none of the above."

Table 10*Participant's Self-Reported Family History of Cancer*

Familial Cancer History Item	n	%
Breast cancer diagnosed at age 45 or under	3	13.0
Triple negative (ER/PR/her 2-) breast cancer diagnosed at age 60 or under	1	4.4
More than one breast cancer in one relative (cancer in both breast or two separate cancers in one breast)	2	8.7
Two or more relatives with breast cancer, with at least one of the diagnoses at age 50 or under	3	13.0
Ovarian cancer, primary peritoneal cancer, or fallopian tube cancer	1	4.4
Pancreatic cancer	3	13
Metastatic prostate cancer	4	17.4
I don't know	5	21.7
None of the above	6	26.1

Approximately four percent of participants identified three or more familial cancer history items followed by those who selected at least 2 familiar cancer history items (13%) and those who selected at least one item (83%). Those who identified at least one of the familial cancer history items are identified as having a strong family history of cancer. The CDC recommends individuals with a strong family history of cancer talk to their healthcare provider about cancer genetic counseling. In addition, if a woman of Ashkenazi or Eastern European Jewish ancestry and have a moderate family cancer history (one or two first degree or two-

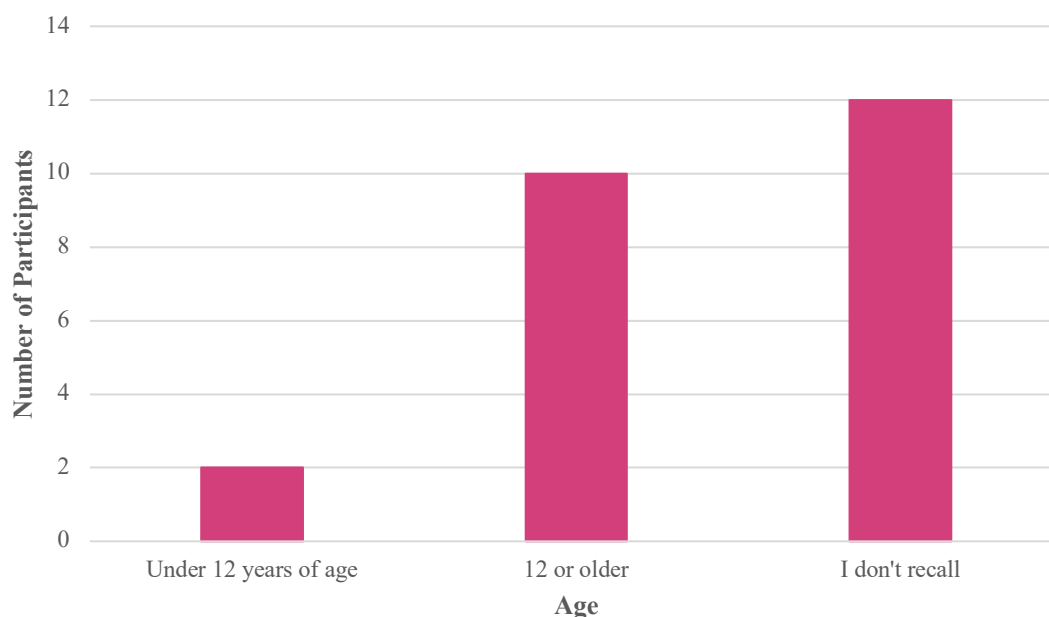
second degree female relatives with breast cancer or men with high-grade prostate cancer), she should consult her healthcare provider about genetic counseling and testing (CDC, 2020).

Genetic Testing

Approximately 8% of study participants reported that they have had genetic testing for a mutation linked to breast and/or ovarian cancer. Approximately 1 out of every 500 women in the United States have a BRCA 1, or BRCA 2 mutation with some populations are more susceptible to the mutation including those with multiple relatives with breast/ovarian cancer, a male relative with breast cancer, a relative with a known BRCA gene mutation, a relative who has had both breast and ovarian cancer, relatives diagnosed with breast cancer before age 50 and women of Ashkenazi Jewish ancestry (CDC, 2019). Women of Ashkenazi Eastern European/Jewish ancestry have a higher risk of having a BRCA 1 or BRCA 2 mutation regardless of family history (CDC, 2020). As such, it is strongly recommended for those at increased risk of having a BRCA 1 or BRCA 2 gene mutation to talk to their healthcare provider at an early age to discuss their breast cancer risk.

Age of Menarche and Risk of Breast Cancer

Approximately 29% of study participants reported an age of under 12 or younger when they started their first menstrual cycle. Several studies have found a distinct relation between age of menarche and breast cancer. Women who started their first menstrual cycle before the age of 11 have about a 15-20% higher breast cancer risk compared to those women who started their first menstrual cycle at age 15 or older (Li et al., 2018). This is mostly due to prolonged exposure to estrogen. Early-onset of menarche can also contribute to an increased ovarian cancer risk and other diseases as well (Bareppady & Nayak, 2019). Figure 9 displays the distribution of the participant's self-reported age of menarche.

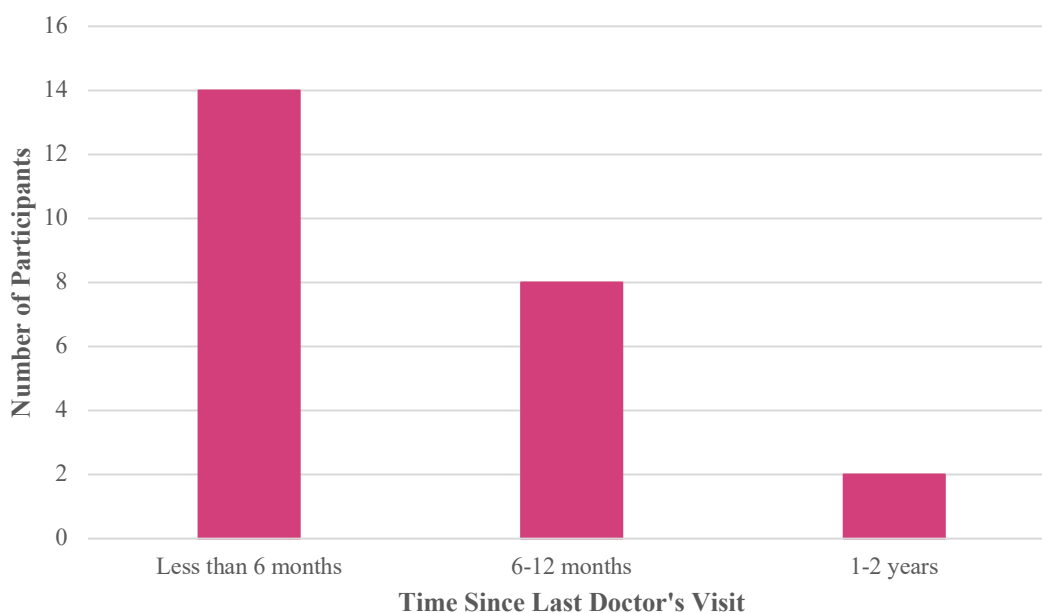
Figure 9*Participant's Self-Reported Age of Menarche***Healthcare Visits**

One of the main messages of the BYB Campaign focuses on the importance of talking to a healthcare provider about your breast cancer risk, given any of the known breast cancer risk factors, and/or having a strong family history. Healthcare providers rely on family cancer history questions to help assess breast cancer risk; however, if these conditions are unknown, it can be helpful to discuss any potential risk factors with a healthcare provider. All study participants reported a recent visit with their healthcare provider within the last 1-2 years. Figure 10 displays the distribution of time since the last healthcare provider visit among the study participants. Approximately 58% of participants reported a healthcare provider visit in less than 6 months of the focus group, 33% within 6-12 months ago, and 9% within the last 1-2 years. Approximately 17% of study participants reported that they have had discussions with their healthcare provider

about their family history of breast cancer and what it might mean for their own health and cancer risk. Approximately 67% of those indicated they had an in-depth conversation with their healthcare provider, whereas 33% noted they only discussed this a little. Of those who reported family cancer history and associated breast cancer risk discussions, all reported they were satisfied with the level of communication they had with their healthcare provider.

Figure 10

Self-Reported Last Visit with Healthcare Provider



Attitudes Towards Breast Cancer

Participants were asked of the attitudes towards breast cancer, more specifically their perceived susceptibility and perceived severity of breast cancer, using Champion's Health Belief Model Scale for breast cancer screening behaviors (Champion, 1993). Survey items for perceived susceptibility include:

- It is extremely likely I will get breast cancer in the future
- I feel like I will get breast cancer in the future
- There is a good possibility I will get breast cancer in the next 10 years
- My chances of getting breast cancer are great
- I am more likely than the average woman to get breast cancer.

The participants were asked to indicate their level of agreement with the items in Table 11. The scale ranged from “strongly agree” to “strongly disagree” with higher scores indicating higher levels of disagreement out of a 5-point scale. Altogether, the study participants had a mean perceived susceptibility score of 18.04 (out of a possible 25) with a standard deviation of 4.44. This finding indicates there is a low perceived susceptibility towards breast cancer among the study participants. This finding is consistent with the literature that examines college female’s perceived susceptibility of breast cancer (Guilford et al., 2017). It appears that college females do not feel that their chances of getting breast cancer are fairly high, despite any breast cancer risks noted previously. Previous studies have attributed this sentiment due to their young age (Yurt, Aksut & Kadioglu, 2019). Most participants disagree that it is “extremely likely” that they will get breast cancer in the future, and most disagree that their chances of getting breast cancer are great. Despite any current risk factors, particularly since fifty percent of the participants had a family history of cancer.

Table 11*Attitudes and beliefs about breast cancer*

Attitude Item	Strongly Agree	Agree	Neither Disagree or Agree	Disagree	Strongly Disagree
Perceived Susceptibility					
It is extremely likely I will get breast cancer in the future	4.3%	4.3%	21.7%	47.8%	21.7%
I feel like I will get breast cancer in the future	4.3%	13.0%	13.0%	52.2%	17.4%
There is a good possibility I will get breast cancer in the next 10 years	0%	8.7%	21.7%	52.2%	17.4%
My chances of getting breast cancer are great	8.7%	8.7%	26.1%	43.5%	13.0%
I am more likely than the average woman to get breast cancer	4.3%	21.7%	17.4%	43.5%	13.0%
Perceived Severity					
The thought of breast cancer scares me	43.5%	30.4%	4.3%	21.7%	0%
Problems I would experience with breast cancer would last a long time	26.1%	30.4%	26.1%	17.4%	0%
If I had breast cancer my whole life would change	34.8%	34.8%	21.7%	8.7%	0%

Survey items for perceived severity include:

- The thought of breast cancer scares me
- Problems I would experience with breast cancer would last a long time and
- If I had breast cancer my whole life would change

Altogether, the study participants had a mean perceived severity score of 6.43 (out of a possible 15) with a standard deviation of 2.66. This finding indicates there is a moderate perceived severity towards breast cancer among the study participants. Mean scores and standard deviations are provided in Table 12 for all perceived susceptibility and severity items.

Table 12

Mean Scores for Breast Cancer Attitudes

Attitude Item	Mean	Standard Deviation
It is extremely likely I will get breast cancer in the future	3.78	0.998
I feel like I will get breast cancer in the future	3.65	1.071
There is a good possibility I will get breast cancer in the next 10 years	3.78	0.850
My chances of getting breast cancer are great	3.43	1.121
I am more likely than the average woman to get breast cancer	3.39	1.118
The thought of breast cancer scares me	2.04	1.186
Problems I would experience with breast cancer would last a long time	2.35	1.071
If I had breast cancer my whole life would change	2.04	0.976

Mean scores were calculated for each item to determine if demographic variables of age, current year in school, race/ethnicity family history of cancer, or genetic testing had a significant effect on perceived susceptibility and severity of breast cancer. Chi-squared analyses determined that there were no significant differences within groups based on age, family history, current year in school, race/ethnicity, or genetic testing. The following section will further explore the effects of these variables along with health behaviors, medical history, and attitudes of breast cancer have on indicators related to the study's evaluation questions.

Bring Your Brave Campaign Materials

Before presenting the findings related to each of the study's evaluation questions, this section will provide a background of each of the BYB campaign materials that were assessed by study participants. These materials include two videos, one podcast, and two infographics. Each of these will be discussed in detail to provide additional context to facilitate the interpretation of study results.

Campaign Videos

Study participants were asked to view two videos and one podcast from the BYB campaign, which highlight three stories of personal accounts with breast cancer. One video showcased the story of Emily and Caroline, two sisters who sought different options after assessing their breast cancer risk. The second video showcased the story of Jackie, the mother of a young daughter, who decided to make a choice based on her daughter after assessing her breast cancer risk. The podcast story featured the life of Meagan, a college student, who's recent self-breast exam prompted her to take action. Each of the stories is discussed in greater detail below.

Emily and Caroline

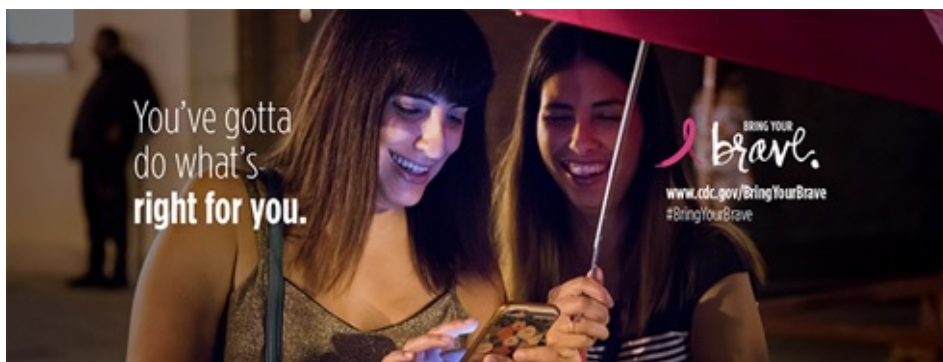


Figure 11. Photo of Emily and Caroline from Bring Your Brave video

The synopsis for Emily and Caroline's video is as follows:

Sisters Caroline and Emily chose different paths, but their support for each other and their decisions remained unwavering. Emily lives in Washington DC, where she works full time and enjoys life downtown – good food, live music, and being a short distance from her family outside the city. When Emily was fresh out of college, her mom was diagnosed with breast cancer. Caroline, a stay-at-home mom, living in Northern Virginia, is Emily's older sister. She was engaged and planning her wedding when their mom was diagnosed with breast cancer in 2012. They found out their mom had a BRCA-2 gene mutation, raising their risk for breast and ovarian cancers. It was possible that Caroline and Emily could inherit the BRCA-2 mutation from her. Caroline wanted to learn about her own risk. She saw a genetic counselor and decided to get tested to determine if she had inherited the BRCA2 gene mutation from her mom. Testing found the gene. After Caroline began breast cancer screening with mammograms and MRIs, her doctor found something abnormal. She decided to do a bilateral prophylactic mastectomy and breast reconstruction surgery. Emily also decided to learn about her risk

and found out she had the genetic mutation as well. She decided to do frequent checkups and screening. (Bring Your Brave Website, 2020)

Jackie



Figure 12. Photo of Jackie and daughter

The synopsis for Jackie's video is as follows:

Jackie has a paternal history of breast and ovarian cancer and a BRCA gene mutation. She discussed her family history with her doctor, who recommended she seek genetic counseling. Her genetic counselor knew that her risk of breast and ovarian cancer could be passed down through either parent's side of the family and recommended Jackie get genetic testing, which is how she learned she was positive for the BRCA 1 gene mutation. Jackie decided to have her ovaries removed. Jackie feels empowered by the roadmap she has created to manage her risk and is hopeful for a bright future for herself and her 4-year old daughter. Jackie lives in Maryland and works as a medication safety evaluator. (Bring Your Brave Campaign Website, 2020)

Meagan

Figure 13. Photo of Meagan

The synopsis for Meagan's video is as follows:

During her senior year in college, Meagan, 22, noticed an irregular, pea-sized lump in her breast. When the lump did not go away after a few weeks, Megan decided to have it checked by her health care provider. Test results found that the lump was a fibroadenoma – a type of benign tumor in the breast that is common in women under age 30. While the experience was incredibly nerve-racking, Meagan often confided in her family, boyfriend, and close friends. She also relied on other women's stories to help her through the process, as she has no family history of breast cancer. Meagan wants to empower and educate young women about their risk for breast cancer, particularly the importance of being aware of changes in your body and talking with your health care provider. Meagan, who lives in California, enjoying hiking, playing music, and spending time with her friends and family. (Bring Your Brave Campaign Website, 2020)

Infographics

Study participants were asked to review BYB infographics and provide feedback.

Infographics can be found in Appendix H. Infographics developed for specific target audiences, such as African Americans and Ashkenazi Jewish women, were shown to respective focus groups that were comprised of these ethnic groups.

Evaluation Question Findings

This section presents results for each of the evaluation questions. Cultural responsiveness is further explored within the focus group dialogue which will be highlighted within the discussion of each relevant evaluation question.

Participants' Knowledge of Breast Cancer Risk and Prevention

The first evaluation question explored correlations of knowledge with various demographic, health behavioral, medical history, or attitudinal variables. Study participants experienced an increase in knowledge after exposure to the BYB campaign, and this increase was significant ($t = -6.027$, $df = 23$, $p = 0.000$). Further, it was determined that baseline knowledge of breast cancer risk and prevention are correlated with demographic variables of age, current year in school, and health behavior variables of physical activity and current non-smokers. However, these correlations were not observed in the post-knowledge assessment scores. The following sections further explore these findings with respect to changes in knowledge controlling for demographic variables of age, race/ethnicity, and current year in school. Followed by health behavior variables of physical activity, tobacco use, alcohol consumption, and perceived health status; medical history variables of cancer family history, genetic testing, age at menarche, and healthcare provider visits and finally, attitudinal variables assessing breast cancer

perceived susceptibility and severity. Each section provides a discussion on the increase in knowledge after exposure to the BYB campaign as it controls for the aforementioned variables.

Participants in each focus group completed a pre- and post-assessment that included knowledge-based questions at baseline and after exposure to the BYB campaign. True or false questions were developed based on information provided in the BYB campaign and associated campaign materials such as infographics. Knowledge items are the same for both pre- and post-assessments and are listed in Table 13. Knowledge items were given one point for each correct answer for a total possible score of 7. The mean knowledge pre-test score for all study participants was 5.46 (SD= 1.02) and 6.54 (SD=0.59) for knowledge post-test scores.

Table 13

Breast Cancer Knowledge Indicators

Knowledge Items (True/False)
• Breast cancer is the most common cancer in American women. • Breast cancer is less common in younger women than in older women. • BRCA gene mutations do not increase one's risk for breast, ovarian or other cancers. • Healthy lifestyle choices such as maintaining a healthy weight and exercising regularly decreases the risk for breast cancer. • Having close relatives who were diagnosed with breast or ovarian cancer (particularly at age 45 or younger) puts you at a higher risk for getting breast cancer. • Talking to my healthcare provider can be helpful in managing my breast cancer risk. • Breastfeeding reduces my risk of getting breast cancer.

Demographic Significance

A chi-square test of independence was calculated comparing various demographic variables to pre- and post-knowledge assessment scores. A significant difference ($p=0.007$, Chi-square = 33.354) was found between age and participant pre-test scores. Participants who were 20 and older tended to have higher pre-test scores (5.5) than those under 20 (5.25). However,

there was not a significant difference detected between age and post-test scores. This finding may support increases in the knowledge that were attributed to exposure of the BYB campaign. Race/ethnicity was not found to have a significant difference between pre- or post-knowledge assessment scores.

A significant difference ($p=0.00$, Chi-square= 38.218) was detected between pre-assessment knowledge scores and the participant's current year in school. This may be partly due to the alignment of age with current year and school. Seniors and juniors tended to score higher (5.5) than sophomores and freshmen (5.3) on pre-test knowledge scores. A significant difference was not observed between any of the groups based on current year for post-assessment knowledge scores. This finding may imply the increase in knowledge may be directly linked to the effects of the BYB campaign.

Health Behavior Significance

Participants who were more likely to engage in healthy behaviors (engaging in regular physical activity, reducing alcohol consumption, eating a healthy diet, etc.) to reduce their chances of getting breast cancer after viewing BYB stories had higher pre-test scores than those who were “moderately likely”, “neither likely or unlikely” or “moderately unlikely” to engage in healthy behavior ($p=0.004$, Chi-Square= 29.022). Similar results were not observed with the post-assessment knowledge score. Participants who engaged in physical activity at least 2-3 times per week had higher pre-assessment knowledge scores (5.5) than those who did not participate in physical activity or engaged in physical activity less than once per week (5.3). Similar results were not observed with the post-test knowledge scores. BMI did not have an effect on either pre- or post-assessment knowledge scores.

Smoking status was found to have a positive correlation with pre-assessment knowledge scores ($p=0.000$, Chi-Square= 24.000). Those who identified themselves as current smokers had significantly lower pre-test scores (2.0) than those that did not smoke (5.6). However, there was not a significant difference detected between post-assessment knowledge scores. This finding may support increases in knowledge that were attributed to the BYB campaign. Alcohol consumption had no effect on either pre- or post-assessment knowledge scores.

Participants who rated their health as “excellent” had significantly ($p=0.000$, Chi-Square=28.000) higher pre-test scores (7.0) than those who ranked their health as “very good” (5.7) or “average” (5.0). Similarly, those who ranked their health as “very good” had higher pre-test scores than those who ranked their health as “average.” However, there was not a significant difference detected between post-test scores. This finding may support increases in knowledge that were attributed to the BYB campaign.

Medical History Significance

Participants with a known family history of cancer scored lower on the pre-test (5.17) than those who were unsure of their family history or had no known cancer family history (5.75). Interestingly, those with a family history of cancer scored slightly higher on the post-test (6.58) than those who were unsure of their family history or had no known cancer family history (6.50). However, these results were not significant.

Participants who have had genetic testing for a mutation linked to breast and/or ovarian cancer had a similar pre-test score (5.5) to those who had not had genetic testing (5.45). A significant difference was not detected for pre-test knowledge scores. However, a significant difference ($p=0.003$, Chi-square = 11.844) was detected in post-test knowledge scores between those who have had a genetic test (6.0) and those who have not had genetic testing (6.59).

Interestingly, a significant difference ($p = 0.037$, Chi-Square = 16.364) was detected between study participants' age at menarche. Study participants who could not recall their age of menarche had a significantly higher pre-test knowledge score (7.0) than those who were 12 or older (5.38) or under 12 (5.43). Similar effects were not detected for post-test knowledge scores.

Participants who had a visit with their healthcare provider within the last 6-12 months had significantly $p = 0.004$, Chi-Square = 15.5) higher post-assessment knowledge scores (6.9) than those who a visit in the last 6 months (6.5) and 1–2 years (5.5). This significance was not observed for pre-assessment knowledge scores. There were no significant differences between pre- and post-assessment knowledge scores among those who talked to their healthcare provider about their breast cancer risk than those who did not have a conversation about their breast cancer risk with their healthcare provider.

Breast Cancer Attitudes Significance

There were no significant differences detected on study participants' perceived susceptibility or perceived severity of breast cancer and knowledge at baseline or post-assessment knowledge scores. Perceived susceptibility and perceived severity items were not measured during the post-assessment. As such, the baseline scores were only used to determine if there was a correlation with perceived susceptibility and perceived severity on knowledge attainment.

Exposure to Bring Your Brave Campaign and Increases in Knowledge

The second evaluation question examined how exposure to the BYB campaign correlates with increases in knowledge of breast cancer risk factors and breast cancer prevention. Study participants experienced an increase in knowledge after exposure to the BYB campaign, and this increase was significant after controlling for variables mentioned previously ($t = -6.027$, $df = 23$,

$p=0.000$). Knowledge items were given one point for each correct answer for a total possible score of 7. The mean pre-assessment knowledge score for all study participants was 5.46 (SD=1.02) and 6.54 (SD=0.59) for post-assessment knowledge scores. No significant differences were observed between focus groups on either the pre- or post-assessment knowledge scores. Table 14 displays pre- and post-assessment knowledge scores by focus group.

Table 14

Pre-Test & Post-Test Knowledge Scores by Focus Group

Focus Group	n	Pre-Test Knowledge Score	Post-Test Knowledge Score
Focus Group A	3	5.0	6.25
Focus Group B	3	6.0	6.67
Focus Group C	5	5.6	6.33
Focus Group D	6	5.5	6.33
Focus Group E	1	6.0	7.0
Focus Group F	5	5.2	6.6
Total	24	5.46	6.54

Given the significant difference between pre- and post-assessment knowledge scores, additional qualitative analyses were conducted to fully explore how exposure to the BYB campaign could increase knowledge and serve as an effective health education campaign. Within the focus groups, study participants were asked to discuss items within the two videos, one podcast and infographics that were “confusing” or “hard to understand,” which represented overall opportunities for knowledge attainment. Many of the “confusing” or “hard to understand”

sentiments were resolved with exposure to campaign materials, particularly the campaign infographics. The participants did not note any “confusing” or “hard to understand” sentiments with the podcast. However, there were several themes that were common misunderstandings in the two videos within the focus group discussion. Participants noted that both videos contained unfamiliar or confusing medical terminology, which often distracted them from the story. Participants also noted that they were unfamiliar with the BRCA mutations, which are key aspects of the BYB campaign. In addition, many participants noted that various aspects of both storylines were unclear or hard to follow. Each of these themes will be discussed in greater detail in the following sections. The final section will cover the “ah-ha” moments the participants’ experiences after reviewing additional BYB materials that explained many of the “confusing” or “hard to understand” information presented in the videos.

“I Don’t Know the Terminology”: Unfamiliar or Confusing Medical Terminology

One of the most popular sentiments expressed in the focus groups during the BYB videos was focused on the inclusion of medical terminology that was “hard to understand” or was “confusing.” Some of the unfamiliar/confusing medical terminology used in Caroline and Emily’s video was: triple-negative breast cancer, BRCA mutation carrier, BRCA2 mutation, and bilateral prophylactic mastectomy. Medical terminology noted in Jackie’s video included BRCA1 positive and ovary removal. The following quotes from the focus groups illustrate immediate responses that highlight confusion or unfamiliarity with the medical terminology.

Some of the medical terms kind of stuck to me a bit. I didn’t know what they were. (Focus Group A, African American)

I guess I don't know the terminology, to be honest, so when they say BRCA and when they said triple negative. I don't know the terminology so what does that mean? (Focus Group D, African American)

The ovaries part. I didn't know that had to do with BRCA. I'd never heard about that part before, I thought it was just breast cancer. You have to get rid of your breast, just saying. (Focus Group E, Ashkenazi Jewish Ancestry)

I guess I personally know what a double mastectomy is, but someone who wouldn't would just be like, is that serious? Is that not? (Focus Group F, Ashkenazi Jewish Ancestry)

In addition to feeling confused about the medical terminology, many participants indicated that they desired more information about the medical procedures or decisions presented in the videos - many expressed sentiments of wanting to experience the storyteller's emotions when those decisions were made.

Oh yeah, I agree, and she used a lot of words with it, so I didn't know ... and she was saying how it's not an easy decision, which from an outside perspective, it seems like ... I think she said it wasn't an easy process. So, I think she could have entailed what she had done to her, maybe. (Focus Group F, Ashkenazi Jewish Ancestry)

There was one participant familiar with the medical terminology but could empathize with those who may find it difficult.

My parents are in the medical field, so it wasn't hard for me to follow along. But I feel like if you don't have that, some of the words are... You're like, 'Okay she had surgery.' (Focus Group C, Asian/Pacific Islander)

Conversely, the vast majority of the study participants did not find anything confusing or hard to understand within Meagan's podcast. In fact, many participants felt Megan's story was the "simplest" one and the "most easy to understand".

Very simple. Like they didn't bring up any mutations. She was like, I checked my mom and I felt like it was very relatable. The most simple one. Yeah. (Focus Group B, Caucasian)

It was easy to follow even though there wasn't like it was just her talking. But like, you know, sometimes I feel like the ones like where they're just talking instead of if there is like background music videos, stuff like that, sometimes it's easier to focus on like what they're talking about because it's just them talking. (Focus Group B, Caucasian)

These sentiments provide some context on the relative baseline knowledge of college women and their health literacy around breast cancer in general. One participant, being a child of parents in the medical field, had no problem with the terminology but recognized the need for further explanation to the general audience. Others noted that perhaps the message was tailored to an audience with an understanding of these terms. Perhaps when things are difficult to understand or are unclear, the message of the story can be missed. Clear messages with relatable storylines appear to work well for minimizing confusion and encouraging education or knowledge attainment. It is critical to recognize these occurrences to ensure future messages include explanations of terms that may not be common knowledge to the target audience to facilitate comprehension (Hurtado-de-Mendoza et al., 2019).

Similar sentiments were observed in a study conducted by Hurtado de Mendoza et al. (2019), who conducted focus groups to gather feedback on a culturally responsive narrative film to enhance the use of genetic cancer risk assessments in Latina women at risk for breast and

ovarian cancer. Focus group participants noted confusion with several medical terms and preferred the film to avoid medical jargon to avoid confusion and encourage a focus on the message of the film (Hurtado de Mendoza et al., 2019).

BRCA Gene Mutations – What are those? Many of the study participants stated that they were unfamiliar with the BRCA mutation and were unaware of the difference between the BRCA1 and BRCA 2 genes. This is an important sentiment as the awareness of family BRCA gene mutations are one of the cornerstone messages of the BYB campaign.

I guess just again, the medical terminology, like I just don't know what BRCA means. And the difference between the 1 and 2, stuff like that. (Focus Group C, Caucasian/African American)

BRCA. I didn't know what that was at all. (Focus Group A, African American)

The mutation, they kind of, I feel like they like breezed over what it was, and she was just like, so we got test. I was like, okay well yeah. (Focus Group B, Caucasian)

Yeah, just the difference between the two mutations. I thought they were the same until she said she had one or two. That kind of thing. (Focus Group B, Caucasian)

I don't know what the BRCA gene is, so I am lost, because I don't know what that is. It didn't explain it. But maybe they're assuming we all know this information.

Many noted they had heard about the BRCA gene mutation but did not know exactly what it was.

That's true. Yeah. I don't really know anything about that. I've heard about it in class and stuff. (Focus Group F, Ashkenazi Jewish Ancestry)

One participant recalled hearing about it BRCA through the media surrounding the story of Angelina Jolie.

I only knew what the BRCA gene was since they said, because I remember it was a big thing with Angelina Jolie a while ago and I think, I guess she was advocating for women to go and get tested for it. (Focus Group D, African American)

There were also sentiments desiring to learn more about the BRCA gene mutation.

I want to know what causes a mutation. I know that there's different factors and that sometimes some mutations you don't know what exactly causes it. If you don't have clear family history of breast cancer, you're like, well, am I susceptible at all? That's something that should be more immediate in my mind. (Focus Group C, African American)

Given that there was continued interest in wanting to know more about something that was unfamiliar provides some insight that there was some interest in the campaign material. This is important as interest may also influence the attainment of knowledge as the campaign user utilizes campaign materials to seek the desired information. This is consistent with the literature that states that participants tend to react favorably to health messages that are relatable and present new information (Roditis, Jones & Alexander, 2019).

Wait, What Happened? Confusing BYB Storylines

Participants also noted some confusion with various parts of the storyline in both videos. In particular, several stated confusion with some aspects of Jackie's story. There is a scene in Jackie's video (Timestamp: 0:53;

https://www.cdc.gov/cancer/breast/young_women/bringyourbrave/stories/jackie/index.htm)

where she is walking in the woods engaging in physical activity with a friend. Several of the participants were confused with this scene as the narration during the scene is Jackie discussing meeting with a genetic counselor. Many participants assumed the woman walking in the woods

with Jackie was her genetic counselor and were confused about why they would be walking casually in the woods, discussing the results of her genetic test. One participant stated:

At one point, she was in a forest, and I have no idea who she was with. It might have been her genetic counselor. But why is she meeting with her genetic counselor in a forest? That part, I just thought that was really sudden and unexpected. If it was in an office building, I would have been like, oh, okay. But it just didn't ... There was a disconnect between what I was seeing and what I was hearing. (Focus Group F, Ashkenazi Jewish Ancestry)

Participants also reported some confusion around the distinction of the sisters in the Emily and Caroline video. Many participants noted it was hard to follow and would sometimes get confused about which sister was speaking. One participant stated:

At first it was kind of hard to follow who was who. (Focus Group C, African American)

This is very important to note as these aspects of confusion can distract one from the intended message or cues to action. Ensuring that the storyline flows well and avoids any aspect of confusion is critical for this population. These sentiments are consistent with previous studies that have examined the importance of a coherent storyline that is relatively easy to follow and avoid any gaps in sequence (Scherr et al., 2020).

Ah-ha Moments in BYB Infographics

Participants had an opportunity to gain knowledge about many of the items they were initially confused or unclear about once they had an opportunity to review the campaign infographics. Some of the immediate reactions in response to reading the information within the BYB infographics were as follows:

Breast cancer, BRCA, makes sense everybody has the gene. (Focus Group B, Caucasian)

It's like one in eight women will be diagnosed with breast cancer, which is scary here, but we need to know like, cause I didn't think it was that common. But like seeing the one in eight, like I'm friends with 15 people right? Two lives like yeah, potentially could be diagnosed. (Focus Group B, Caucasian)

I didn't know this stuff like about the breastfeeding does reduce your risk, which is interesting. (Focus Group B, Caucasian)

The development of clear, plain language infographics can be used in instances where baseline knowledge may need to be attained prior to exposure to public health campaigns. Participants were enlightened to learn the medical terminology and campaign aspects that were originally confusing. Perhaps this information would have been useful prior to viewing the videos or listening to the podcasts or better explained within the context of the health messages. It is definitely a key component to consider when evaluating the effects of campaign exposure on knowledge attainment. An additional step to knowledge attainment is the ability for a campaign user to transport into the narrative for self-resonance and identification to possibly elicit the desired behavior change (Lee, Fawcett & DeMarco, 2015). Lee et al. (2015) further note the identification with characters increases absorption, reduces counterarguing, and thus enhances the listener/viewer's acceptance of the values and beliefs portrayed in the story. The subsequent section will further explore how the study participants experienced narrative transportation while viewing and listening to BYB videos and podcast.

Narrative Transportation Experiences

The third evaluation question examined how college-aged women experienced narrative transportation in response to viewing and/or listening to the BYB campaign. The narrative

transportation theory explores how an individual becomes immersed or transported into a story after watching and/or listening to a story (Green and Brock, 2000). Green and Brock (2000) developed the Narrative Transportation Scale to measure this phenomenon. Study participants were asked to complete the Narrative Transportation Scale after viewing each of the BYB Campaign videos and listening to the podcast. There were 11 narrative transportation scale items for each of the videos and 12 items for the podcast. Scores ranged between 11-77 for the videos and 12-84 for the podcast with higher scores depicting a higher transportation effect in response to the story. Participants were asked to select the number that best represents their opinion to the story on a scale from 1-7 with 1 being “not at all” and 7 being “very much.” Three items were reverse scored.

Overall, study participants were transported to a higher degree with the podcast (54.4) compared to both videos (44.8 and 44.0). This difference was found to be significant ($p=0.000$) in comparison to both videos. The Narrative Transportation score for Emily and Caroline’s video (44.8) was slightly higher than Jackie’s (44.0) video; however, this difference was not significant. Table 15 displays the mean narrative transportation scores for each of the BYB videos and podcast together and by Focus Group.

Table 15*Focus Group Narrative Transportation Score*

Focus Group	n	Narrative Transportation Score (Emily & Caroline)	Narrative Transportation Score (Jackie)	Narrative Transportation Score (Megan)
Focus Group A	4	43.5 (40-47)	47.25 (45-50)	50 (33-64)
Focus Group B	3	48.7 (46-51)	45.3 (41-50)	65.3 (61-70)
Focus Group C	5	45.2 (35-56)	44.8 (40-58)	55.4 (40-66)
Focus Group D	6	42.5 (33-57)	43.7 (36-54)	51.8 (41-57)
Focus Group E	1	40	40	55
Focus Group F	5	46.8 (31-71)	41.2 (26-52)	53.2 (39-66)
All Groups		44.8 (31-71)	44.0 (26-58)	54.4 (33-70)

To elaborate on participants' transportation experiences, the following sections discuss the key findings concerning each BYB story with attention to transportation score items for each focus group. Each section will further elaborate on any facilitators or barriers to participant's narrative transportation experiences. Resonance was a key facilitator to narrative transportation across all focus groups in different ways.

Key Findings from Emily and Caroline's Video

The first story presented to participants in video format and featured sisters Emily and Caroline. Emily and Caroline's video was approximately two minutes and eleven seconds in length. After viewing the video, participants completed the narrative transportation scale.

Narrative transportation scores for each of the narrative items within and across focus groups are found in Table 16. The mean transportation score for Emily and Caroline's video was 44.8 out of a possible 77 suggesting a moderate narrative transportation effect across the participants.

Transportation scores were highest (48.7) in Focus Group B, which were comprised of only Caucasian women. Independent t-tests were conducted to determine any significant differences between mean narrative transportation scores between focus groups. No significant differences were detected. Immediately following the participants completing the narrative transportation scale, participants were engaged in a focus group discussion to provide insights into their narrative transportation experience.

Table 16*Narrative Transportation Score Items: Emily and Caroline*

Narrative Transportation Scale Item	Focus Group A	Focus Group B	Focus Group C	Focus Group D	Focus Group E	Focus Group F	Total
While I was viewing the story, I could easily picture the events in it taking place.	4.5 (3-6)	6.7 (6-7)	5.6 (3-7)	5.0 (3-7)	7.0	6.40 (5-7)	5.62 (3-7)
While I was viewing the story, activity going on in the room around me was on my mind.*	2.0 (1-5)	2.3 (2-3)	3.2 (3-4)	2.17 (1-5)	4.0	2.6 (1-7)	2.5 (1-7)
I could picture myself in the scene of events described in the story.	5.25 (3-7)	6.33 (5-7)	4.6 (4-7)	3.83 (1-6)	3.0	5.0 (3-7)	4.75 (1-7)
I was mentally involved in the narrative while viewing it	6.0 (4-7)	6.33 (5-7)	5.2 (3-7)	3.8 (3-5)	3.0	5 (3-7)	4.75 (1-7)
After the story ended, I found it easy to put it out of my mind.*	3.3 (1-5)	2.3 (1-3)	3.8 (3-5)	4.7 (3-6)	4.0	3.8 (2-7)	3.8 (1-7)
I wanted to learn how the story ended.	6.5 (6-7)	6.3 (6-7)	5.6 (4-7)	5 (1-7)	6.0	5.2 (3-7)	5.6 (1-7)
The story affected me emotionally.	3.8 (2-6)	5.7 (5-6)	3.2 (1-7)	2.5 (1-4)	4.0	4.6 (2-7)	3.75 (1-7)
I found myself thinking of ways the story could have turned out differently	2.8 (1-4)	4.3 (2-6)	5.2 (3-7)	4.7 (1-7)	3.0	4.6 (1-7)	4.3 (1-7)
I found my mind wandering while viewing the story*	3.0 (1-5)	2.0 (1-3)	2.6 (1-4)	4.2 (1-7)	1.0	2.6 (1-6)	2.9 (1-7)
The events in the story are relevant to my everyday life	4.5 (2-7)	4.0 (3-6)	3.8 (3-4)	4.5 (1-7)	1.0	3.6 (1-7)	4.0 (1-7)
The events in the story have changed my life	2.0 (1-3)	2.3 (2-3)	2.4 (2-4)	2.2 (1-7)	1.0	2.0 (1-4)	2.1 (1-7)

Items with an asterisk were reverse coded

The sections below highlight key findings from Emily and Caroline's videos as it relates to understanding the narrative transportation score. Key findings are centered around resonance, including familial and cultural resonance, a desire to know more about the story, and how narrative transportation elements have influenced an intention to change behavior.

Familial Resonance. Familial resonance refers to the identification of the story based on having a family member or a personal history with breast cancer. Familial resonance appeared to play an important role in several of the narrative transportation scale items. Of the focus group participants who noted a relation to the main characters of the video, the vast majority could relate to having a family member with breast cancer. Many recounted their own familial experiences of breast cancer as a way to identify with the characters and transport into the events into the story being told.

I could relate because two years ago my mom found out she had stomach, ovarian and pancreatic cancer. (Focus Group A, African American)

My grandma and my great-grandma both had breast cancer, so I guess it just really made me say, Oh I should probably go to the doctor soon. (Focus Group C, Caucasian)

One participant noted a familial history of breast cancer but noted that an immediate family member, who is a physician, informed them they were "pretty confident" that they were not going to get breast cancer because the familial cancer history was not genetic. As such, the participant could not resonate despite having a family history.

What my mom had; it wasn't that gene. I know that for sure. She had breast cancer and she got treated for it and she goes in for mammograms quite often. It was from her medication rather than genetics. My dad is in the health field and he's pretty confident that I'm not going to get it, which makes me feel a little bit better. There's a possibility of

me getting it, but it's not nearly as high as if I had the gene. (Focus Group E, Ashkenazi Jewish ancestry)

Several participants indicated relation to the main characters based on recent personal experiences with breast or other cancers.

I had to get checked once because when I was a freshman here my gynecologist found, like a mass in my breast and I ended up having to get it surgically removed as well. But it was just like a fibroadenoma, so nothing too serious. But you know, at the time, they didn't know what it was so scary for everybody in my family. So that was kind of like powerful for me since I went through that whole counsel process and all that. (Focus Group B, Caucasian)

I could relate because two years ago my mom found out she had stomach, ovarian and pancreatic cancer. I was having some issues a couple of months ago, and the doctor was like, if these issues keep recurring, you may need to come in to do some scans to see if the ovarian cancer has been passed down to me. (Focus Group A, African American)

Additionally, a few noted some resonance due to having close siblings. Interestingly, those without siblings did not relate to the main characters of the videos.

I think for me, I related too. And I could see myself in that decision, just handing out with your siblings. Just talking about important topics, talking about different things, going to the doctor being one of them. So, it was relatable in that aspect. It looked like a normal family. (Focus Group C, Caucasian/African American)

I don't have any siblings, so honestly, no. (Focus Group C, Caucasian)

Conversely, a few participants noted no relation to the main characters of the video. For many without a family or personal history of cancer, there was no relation to the main characters.

However, many of these participants noted “sympathizing” or “feeling bad” for the main characters in the video.

I personally didn't really feel like I related to them, just because, I don't have any breast cancer in my family, and I just felt like they seemed older than me, so I don't even think that would be for me. I wouldn't even consider it as an option for me, so I didn't relate. sympathized, but I didn't feel like I would relate to that. (Focus Group F, Ashkenazi Jewish ancestry)

I also sympathized. I feel bad for them, but I didn't really relate. I didn't see myself in their story. (Focus Group F, Ashkenazi Jewish ancestry)

I felt kind of sad for them. I felt for these women because what they have to go through is a lot to handle. (Focus Group E, Ashkenazi Jewish ancestry)

Cultural Resonance. Cultural resonance was explicitly stated as a key reason why or why the participant did or did not relate to the main character of the story. Cultural resonance is the identification with someone or something based on cultural characteristics that are similar to themselves. Focus groups comprised of African American women reported low resonance to the Emily and Caroline story and most often noted cultural resonance as a key reason. Previous studies have noted that individuals appeal more to materials that are culturally relevant to them. A recent study conducted by Leshner, Bolls, Gardner, Moore & Kreuter (2018) examined the impact of narrative and emotion on processing African American Breast Cancer messages. Leshner et al. (2018) used African American women in their messages that were tested with a target audience of African American women at least 40 years old. Findings demonstrated that cognitive and emotional effects would vary as a function of the message structure and emotional

tone of the messages. Leshner et al. (2018) also highlighted that “character identification” plays a vital role in transportation theory and can be enhanced when people identify with the characters in the video or messages. The transportation theory of narrative persuasion comprises dimensions of imagery, affect, and attention, and that absorption into the narrative is necessary for strong impact (Leshner et al., 2018).

Leshner et al. (2018) noted several positive effects for narrative messages, including a more robust emotional response, greater cognitive engagement, and reducing counterarguing when participants identify with the narrative source. Social science researchers continue to explore how narratives can increase understanding, model desirable behaviors, and serve as a valid message strategy for sensitive topics in public health promotion campaigns (Bokhour et al., 2016). This is particularly important in cultures that have a history of storytelling and concomitantly suffer significant health outcome disparities, such as in the African American community (Leshner et al., 2018).

These findings are also consistent with previous testing of the BYB Campaign materials (Reynolds, 2018). Forty women were surveyed in 2018 after viewing the Caroline and Emily video (Jackie and Meagan were not shown in these previous focus groups). Based on findings from a topline report from a series of online testing of BYB materials, the top responses for resonance included:

- I have a family history
- I am young
- I have a family history of breast cancer
- I am an Ashkenazi Jewish woman
- I am a woman; relates to all women
- Sisters were relatable; I have a sister
- Aware of BRCA mutations in my family (Reynolds, 2018)

Similarly, reasons provided by online testing results suggest why resonance did not occur were similar among this age group and previous focus group discussions. These include:

- I do not have a family history of breast cancer
- Spokeswomen not relatable to me (Reynolds, 2018)

Future development of online public health campaigns utilizing storytelling should tailor their messages to resonate with their target audience. It is critical to conduct focus groups with the target audience to facilitate the inclusion of these aspects into their narrative health messages.

What Happens Next. There was also a strong desire among participants to know more about the story. Many participants inquired about the health of the mother and whether or not she survived her battle with breast cancer, while others wanted to know how the story ended. Participants expressed the desire to know more information about the side effects of Caroline's surgery and the emotional impact on her family. This was key in understanding this narrative transportation item of desiring to learn more about the story.

Intentions to Change Behavior. Participants were divided when asked about their intention to take action after viewing the Emily and Caroline video. Taking action included taking steps to learn their family history of cancer and/or talking with a healthcare provider about their breast cancer risk. For some, the video prompted them to inquire more about the BRCA gene should someone in their family get diagnosed with breast cancer.

I think if I found out that someone in my family ended up with breast cancer, I would definitely be like, oh, I can go get tested and now I know that there's things to do. But I don't think I want to go get tested if I don't have anything in my family history right now. (Focus Group F, Ashkenazi Jewish ancestry)

On the contrary, some participants noted that they were not prompted to take action after viewing the video. Suggesting that there were not any cues to action embedded in Emily and Caroline's story.

I don't think the video showed any type of urgency. I thought there was a good outcome but I wasn't like a 'Okay, now your turn. You go get tested type of thing'. (Focus Group D, African American)

The majority of participants did note that the video did move them to encourage someone they knew to take action to learn their family history of cancer and/or talk with a healthcare provider about their breast cancer risk. Mostly, participants felt the urge to encourage someone older or someone with a known family history of breast cancer to implement these actions. These elements are important for understanding this video's ability to promote behavior change. As it appears, many participants missed the "call of action" embedded within each of the stories to engage in the recommended behavior change. Perhaps this element can be considered when refining existing stories and/or creating new ones for the campaign.

Key Findings from Jackie's Video

Immediately following the focus group discussion of Emily and Caroline, the participants viewed Jackie's video, which was approximately one minute and fifteen seconds. Jackie is an African American mother who discusses the relevance of her father's family cancer history and her genetic testing journey. Narrative transportation scores for each of the narrative items within and across focus groups are found in Table 17. The mean transportation score for Jackie's video was 44.0 out of a possible 77 suggesting a moderate narrative transportation effect across the participants. Transportation scores were highest (47.25) in Focus Group A, which were comprised of only African American women. Independent t-tests were conducted to determine

any significant differences between mean narrative transportation scores between focus groups.

No significant differences were detected.

Table 17

Narrative Transportation Score Items: Jackie

Narrative Transportation Scale Item	Focus Group A	Focus Group B	Focus Group C	Focus Group D	Focus Group E	Focus Group F	Total
While I was viewing the story, I could easily picture the events in it taking place.	6.5 (6-7)	6.7 (6-7)	5.6 (4-7)	6.0 (5-7)	6.0	5.8 (4-7)	6.0 (4-7)
While I was viewing the story, activity going on in the room around me was on my mind.*	3.0 (1-7)	1.7 (1-3)	2.6 (1-4)	1.5 (1-3)	2.0	1.2 (1-2)	2.0 (1-7)
I could picture myself in the scene of events described in the story.	6.3 (5-7)	4.0 (3-5)	4.8 (3-7)	4.7 (2-7)	3.0	2.8 (1-6)	4.4 (1-7)
I was mentally involved in the narrative while viewing it	6.5 (5-7)	6.3 (5-7)	6.0 (5-7)	6.2 (5-7)	6.0	6.4 (6-7)	6.3 (5-7)
After the story ended, I found it easy to put it out of my mind.*	2.5 (1-4)	2.3 (1-3)	3.4 (1-6)	2.7 (1-5)	4.0	3.8 (2-7)	3.0 (1-7)
I wanted to learn how the story ended.	6.0 (5-7)	6.3 (6-7)	4.4 (3-7)	6.2 (3-7)	6.0	5.2 (3-7)	5.6 (3-7)
The story affected me emotionally.	5.3 (3-7)	4.7 (2-7)	4.6 (3-7)	4.3 (2-6)	6.0	5.4 (5-7)	4.9 (2-7)
I found myself thinking of ways the story could have turned out differently	3.8 (1-6)	5.0	5.0 (3-7)	4.5 (1-7)	4.0	4.8 (1-7)	4.6 (1-7)
I found my mind wandering while viewing the story *	1.5 (1-3)	1.7 (1-3)	2.2 (1-3)	1.7 (1-3)	1.0	1.8 (1-4)	1.8 (1-4)
The events in the story are relevant to my everyday life	3.5 (2-6)	4.0 (3-5)	3.6 (2-5)	4.0 (2-7)	1.0	2.2 (1-4)	3.3 (1-7)
The events in the story have changed my life	2.5 (1-4)	2.7 (2-3)	2.6 (1-4)	2.0 (1-4)	1.0	1.8 (1-3)	2.2 (1-4)

Items with an asterisk were reverse coded

The following section will highlight key findings that are centered around resonance, including cultural and emotional resonance, and how narrative transportation elements have influenced an intention to change behavior.

Cultural Resonance. Cultural resonance was also a key component for the highest transportation scores among African American focus groups (A & D).

I was watching this one and I was like, “Oh yeah, I’m going to get tested, because of my mom’. I would say just because I feel she represents me more just because she was Black. (Focus Group A, African American)

However, there were additional components within these focus groups that accounted for a higher resonance than with the Emily and Caroline video. Some of these components include self-identification with the storyteller and higher emotional resonance, which led to better receipt of the story’s main message. Many also expressed Jackie’s “bravery” and “selflessness” in her decision to get tested for her daughter. These groups also reported feeling more compassion for Jackie’s situation on account of her daughter and the assumption that she was a single mother.

She was also a single mother. She didn’t look like she had family like the other family did. So, if she were to get cancer and everything like that it would have been a lot harder for her daughter because she doesn’t have support. (Focus Group D, African American)

Similarly, those in other focus groups had compassion for Jackie’s daughter, and her decision to have her ovaries removed. One participant noted how she appreciated this moment of empowerment.

I feel like when she said it empowered her, I really like that because it can feel like having to get your ovaries removed because of a risk of cancer, that can feel really un-empowering. You’re like, well, my body isn’t really mine anymore. But she was like, no,

the fact that I can make this decision and do what's best for me and my daughter, the focus on it being empowering, I liked that a lot. (Focus Group F, Ashkenazi Jewish ancestry)

Emotional Resonance. Overall, participants expressed they experienced greater emotions of empathy or feelings of compassion for Jackie's story over Emily and Caroline's story. Despite this, focus groups comprised of other demographics outside of African American women did not resonate with Jackie. Many did not relate to Jackie for several reasons: they were not yet mothers, and Jackie was much older than the women in the focus groups. Interestingly, this was not a reason for the lack of relatedness to Emily and Caroline's story, where Caroline is also a mother. One participant distinguished her sentiments between the two videos highlighting this point.

For some reason, this one, I felt a little stronger about it than the other one, and I think it's maybe about the kid depending on her, because it focused on that. Because in the other one, there were also little kids depending on their mom, but I don't know. For some reason, in this one, because it focused on it, I felt more affected. Maybe because I don't know if the dad's in the picture. They didn't show a dad, but they showed a dad in the other one. I don't know. I don't know what it was, but it affected me a little bit more. I still don't relate. I don't have kids. (Focus Group F, Ashkenazi Jewish ancestry)

Intent to Change Behavior. Jackie's story tended to prompt African American participants to take action for themselves and encourage someone they knew to take action than any other focus group. Taking action included taking steps to learn their family history of cancer and/or talking with a healthcare provider about their breast cancer risk. African Americans also reported being more affected emotionally with Jackie's story. According to Fitzgerald et al.

(2020), narratives that are more emotionally engaging may be more likely to motivate certain behaviors. This may explain why African American's were more likely to engage in a behavior change after viewing Jackie's. In fact, other focus groups noted that Jackie's story did not prompt them to take action mostly due to the fact that they were not parents. Many noted that they would encourage someone they knew to take action if those individuals had a family cancer history and also had children. These findings help reiterate the importance of cultural resonance and demographic underpinnings. Not only are cultural elements important in resonance, but there are also other components such as parental and/or marital status and age that should also be considered. Finding the right combination of resonance factors is critical in the success of the narrative, along with the authenticity of the narrative (Lipsey et al., 2020). This is evident within the next story that is told through podcast audio that eliminates the visual resonance connotations and the medical jargon. Megan, a college student, speaks organically to an audience about her experiences with breast cancer.

Key Findings from Meagan's Podcast

Narrative transportation scores for each of the narrative items within and across focus groups are found in Table 18. The mean transportation score for Meagan's podcast was 54.4 out of a possible 84 suggesting a moderate narrative transportation effect across the participants. Transportation scores were highest (65.3) in Focus Group B, which were comprised of only Caucasian women. Independent t-tests were conducted to determine any significant differences between mean narrative transportation scores between focus groups. A significant difference was detected between Focus Groups B and D ($t=3.706$, $df=5.6$, $p=0.011$). A few interesting effects were observed in these spaces to further explain the significant differences in the narrative transportation score. All participants, regardless of race, ethnicity, or age resonated with Meagan.

Table 18*Narrative Transportation Score Items: Megan*

Narrative Transportation Scale Item	Focus Group A	Focus Group B	Focus Group C	Focus Group D	Focus Group E	Focus Group F	Total
While I was viewing the story, I could easily picture the events in it taking place.	6.0 (5-7)	6.7 (6-7)	6.0 (5-7)	5.8 (5-7)	6.0	6.8 (6-7)	6.2 (5-7)
While I was viewing the story, activity going on in the room around me was on my mind.*	4.5 (1-7)	4.0 (1-6)	3.4 (2-6)	2.5 (1-4)	3.0	3.8 (1-7)	3.5 (1-7)
I could picture myself in the scene of events described in the story.	4.0 (1-7)	6.7 (6-7)	5.6 (3-7)	5.3 (4-7)	6.0	4.4 (2-6)	5.2 (1-7)
I was mentally involved in the narrative while viewing it	3.8 (1-7)	6.3 (6-7)	5.6 (3-7)	5.0 (4-6)	6.0	4.4 (3-7)	5.0 (1-7)
After the story ended, I found it easy to put it out of my mind.*	3.5 (1-7)	3.0 (1-5)	4.0 (2-6)	3.5 (2-6)	3.0	3.0 (1-4)	3.4 (1-7)
I wanted to learn how the story ended.	4.0 (1-7)	6.7 (6-7)	3.8 (1-6)	5.0 (2-7)	7.0	5.0 (1-7)	4.9 (1-7)
The story affected me emotionally.	3.8 (1-7)	5.7 (5-7)	3.4 (1-6)	2.7 (1-5)	6.0	5.2 (3-7)	3.7 (1-7)
I found myself thinking of ways the story could have turned out differently	4.0 (1-7)	6.7 (6-7)	5.2 (4-7)	5.7 (2-7)	6.0	5.2 (3-7)	5.3 (1-7)
I found my mind wandering while viewing the story*	4.8 (1-7)	3.7 (1-5)	3.6 (2-6)	3.8 (2-7)	4.0	4.4 (1-7)	4.0 (1-7)
The events in the story are relevant to my everyday life	3.8 (1-7)	6.7 (6-7)	5.8 (5-7)	4.5 (3-7)	2.0	5.4 (5-7)	5.0 (1-7)
The events in the story have changed my life	2.3 (1-4)	3.3 (2-6)	3.2 (2-4)	2.2 (1-7)	2.0	2.6 (1-5)	2.6 (1-6)
I had a vivid mental image of Megan	5.8 (4-7)	6.0 (4-7)	5.8 (4-7)	5.8 (5-7)	5.0	4.8 (2-7)	5.5 (2-7)

Items with an asterisk were reverse coded

The following section will highlight findings that are centered around resonance, including resonance with life, details and depth of the story, and how narrative transportation elements have influenced an intention to change behavior.

Resonance with Life. The vast majority of participants attributed their resonance to the fact the Meagan was also a college student and is around the same age as the participants. This finding has been observed in similar research (Ooms et al., 2019 & Behm-Morawitz et al., 2019) Some participants noted an additional level of resonance regarding Meagan’s major in public health and coursework in organic chemistry. A participant noted resonance with Meagan; however, she noted that she did not have an emotional connection to Meagan’s story. Another participant noted how the depth of Meagan’s video made her want to check her breast more often. Participants were observed physically checking their breasts as they listened to Meagan’s podcast.

Hers made me more like, I guess because hers went more in depth that like made me more worried about like what her outcome would be. Like yeah, you know, I wanted to know like obviously what was going to happen and stuff. And I guess because she was more relatable, it made me more like worried about it as well. So, it made me want to check myself. (Focus Group B, Caucasian)

Participants also noted that Meagan’s story appeared to be “more believable” as it depicted “everyday college life.”

It seemed really just like everyday college life. She was going to get tested, but she also had the organic chemistry test. She was talking about how she was involved on campus. It was really believable. (Focus Group A, African American)

It was just so realistic. Having a lot of things going on at once and having a go in such a big test right after it happened, it kind of depicts the college life. (Focus Group D, African American)

This is an important concept as many college students, including many in the study, feel like breast cancer is not a disease that occurs at their age. One participant pointed out Meagan's story helped shed some light on the incidence of breast cancer in young women.

I think also, that thing about...I don't know. I'm not going to be like, this isn't me. This doesn't happen to people my age. That's something that's going to be relatable, because a lot of us think about health as in, no, I'm not going to get that. It doesn't happen to people like me. (Focus Group F, Ashkenazi Jewish ancestry)

Details and Depth of Story. Many participants highlighted aspects of how Meagan told her story in addition to its depth. The suspense, particularly the building up to the suspense, was noted as a key attribute of Meagan's story. The following quote illustrates this finding:

Yeah, I think the way she set up the story kind of built suspense. It kind of made me a little scared too. I was like, oh, man, I really hope it's not cancer, because she's only 22. So, I kind of felt scared in this story, whereas in the other ones, I didn't have that feeling. Going through her exams and stuff like that, you know, stuff that obviously like we'd be more stressed about than worrying about like testing herself for that kind of thing as well. So that was definitely like I liked that she kind of talked about that as well. Brought that into focus. (Focus Group F, Ashkenazi Jewish ancestry)

Intent to Change Behavior. Meagan's story prompted nearly every participant from each of the focus groups to personally take action or encourage someone else to take action. The message from Meagan's video charged women to participate in frequent self-breast examinations

and checks. Meagan's call to action was clearly heard amongst all the participants across all focus groups. Additionally, participants inquired about proper techniques for self-breast examinations.

Literally, when I heard Meagan's story, I was like, huh, when's the last time I checked.

(Focus Group F, Caucasian)

I thought about how I never do self-examinations on myself because also I don't know how to, so it would probably be smart to educate myself on how to do that properly.

(Focus Group A, African American)

Participants were also encouraged to prompt action with someone they knew. In this case, many participants noted the desire to share the information from Meagan's story immediately with their sorority sisters and peers.

How she educated the people in her high school, it would be smart for me and my friends before we go out to a party, 'Hey y'all, let's check our breasts real quick because we're all together'. (Focus Group A, African American)

These additional experiences from the focus group help further explain facilitators and barriers to narrative transportation. Adding the focus group element to the narrative transportation scale amplifies its ability to determine the effectiveness of the campaign and, in addition, can be paramount in tailoring stories to specific audiences and overall campaign improvement (Scherr et al., 2020).

Bring Your Brave – The Good, the Bad and What Should be Improved

This section will highlight the findings based on the focus group data for the fourth evaluation question focused on the overall strengths and limitations based on the experiences of

the college women featured in this evaluation. Additionally, recommendations on campaign improvement for college women from the participants' experience are highlighted.

The Good (Strengths)

One of the main strengths of the BYB campaign messaging strategies is its ability to effectively convey the main message of the story. The vast majority of participants understood the central message of each of the three stories and were able to ascertain the key takeaways. There were a few participants who noted that although they did understand the main message of the story, they were conflicted with confusing medical terminology. In other words, they understood the importance of talking to a health provider about one's breast cancer risk in the event genetic counseling is necessary; however, many were unaware of the purpose of genetic counseling. Additionally, participants appreciated opportunities when the story included multiple options for the storyteller. In the Emily and Caroline video, both Emily and Caroline were presented with positive BRCA mutation and choose different options based on their personal lives. Participants stated that they appreciated the two different perspectives of the sisters with particular emphasis on Emily as she based her decision on being a single young adult. Participants were able to relate to Emily on this aspect and appreciated having people resembled the target audience. Participants also appreciated the "realness" or authenticity of the stories in the video and the podcast and enjoyed seeing real families and children in the videos. Participants appreciated the depth of Meagan's story and attributed that depth to authenticate her story. Although they cautioned that by having the kids in the videos, it removed some resonance for them as they were not parents. Participants also noted that background music in the videos fit well with the flow of the stories.

Participants noted that the infographics were extremely helpful in furthering their understanding of the medical terminology presented in the stories. They appreciated that many of the infographics included images of young people and were culturally appropriate (particularly those that featured African American and Ashkenazi Jewish women). Participants noted that the infographics were clear and straight forward. They noted the vibrant colors of the infographic made it eye-catching, and many noted they would stop to read them if they were posted on popular social media sites. Many were surprised at many of the statistics in the infographics, especially the 1 in 8 women will get breast cancer statistic.

Overall, the BYB campaign materials increased knowledge and changed attitudes about breast cancer risks in college women. As part of the post-assessment of the focus group sessions, respondents were asked three questions related to the intention to change behavior. Participants were asked if they were more likely to talk to their family about their family history after exposure to the BYB campaign. Fifty-four percent of participants indicated they were “very likely,” while 46% were “moderately likely” to engage in this behavior. None of the participants opposed this activity. Participants were asked if they were more likely to talk to their healthcare provider about their breast cancer risk after exposure to the BYB campaign. Forty-six percent of participants indicated they were “very likely,” while 50% were “moderately likely” to engage in this behavior. None of the participants directly opposed this behavior. Participants were asked if they were more likely to engage in healthy behaviors after exposure to the BYB campaign. Fifty percent of participants indicated they were “very likely,” while 29% were “moderately likely” to engage in this behavior. Only 4% of participants opposed the adoption of this behavior.

Limitations

Videos. Participants also noted several limitations to the BYB messages and materials. Participants expressed the desire to know more about various aspects of the stories presented in the videos. For Emily and Caroline, participants expressed the desire to know what happened to their mother. They felt that since she was featured in the video and was the main reason behind their motivation for testing, participants wanted to also hear about her breast cancer journey. In addition, many participants noted that they could not differentiate between Emily and Caroline. Many noted it would have been helpful to have the sister's names appear at the bottom of the screen to reduce confusion.

In Jackie's video, participants assumed the woman walking in the woods was Jackie's genetic counselor. Participants expressed that they were confused as to why genetic counseling conversations were taking place in the woods. Jackie's narration of her genetic counseling experience spoken simultaneously as Jackie and a friend were walking in the woods in her video. This was distracting and could potentially reduce the intensity of narrative transportation.

In addition, participants noted that they wanted to know other options for Jackie. They felt Jackie's ovary removal was a radical decision and wondered what other options were available for someone in her position. This was heightened by the fact that participants felt Jackie was older and already had a child. Given that the participants were young women without any children, and possibly desiring children in the future, they wanted to hear about options for people like them. One participant did note, however, that she felt the videos were more proactive. She expressed a desire for videos to capture a different aspect of empowerment with women taking control of their health after a situation occurs, say after a breast cancer diagnosis. She noted that she would be more representative of what actually occurs in life.

I just feel like it's also not a happy ending. I find of feel like all of these videos of proactive, which is something that needs to happen but I feel like as people see what happens on the other side they'll be more wanting to do something instead of just saying, 'Oh, I got this done. I was being proactive so you should too.' But, if you could see what actually happens when you're not proactive, I feel like that would be more impactful.

(Focus Group D, African American)

A lack of understanding of medical terminology in the videos was a key limitation among participants. Many participants expressed that they had no prior knowledge of the BRCA gene mutation, triple-negative breast cancer, and prophylactic bilateral mastectomy. Participants noted that Meagan's story was straightforward and easier to understand as Meagan did not use medical terminology that was unfamiliar to participants. Many expressed their unfamiliarity with more than one BRCA gene mutation (i.e., BRCA1 and BRCA2).

Podcast. Although narrative transportation scores were significantly higher with the podcast story, most participants preferred the video format over the podcast format.

I think it's the wrong platform. Like I don't know. I wish it wasn't a podcast. I'm less inclined to listen to those podcasts. (Focus Group B, Caucasian)

I would only seek out that podcast if I like thought I had something was wrong. Unless it liked pops up somewhere. (Focus Group B, Caucasian)

Many noted that they listen to podcasts that were more "light and funny" and probably would not seek out podcasts like the BYB podcasts unless they are seeking information on breast cancer risk. While participants enjoyed the story, they noted that they would have preferred to see Meagan tell her story, as in a Ted Talk format. One participant expressed her desire to have visuals while engaging in a story.

And I think with podcast's, it's also hard to really maintain your complete focus and attention, so even if this had been in a Ted Talk format, where she was just standing there talking, it's still kind of like a podcast. She's just talking. There are no visuals going on but we have something to look at, it would have been easier, because I sometimes found myself wandering. I would like to look and see, look at you guy and see what's going on, and then I'd be like, oh, wait, I have to be listening to this. (Focus Group B, Caucasian)

Infographics. Participants noted a few limitations regarding the BYB infographics.

Overall, the majority of the participants noted the photos did not represent college-aged women. A few participants noted that they felt the photos did not display “real women” and appeared to be stock photos, which gave the illusion that these women were not affected by breast cancer.

I think it is weird that they show pictures of random women who don't look sick. When I see that I'm just like they look happy. It doesn't really make you want to go get checked or anything like that. (Focus Group D, African American)

Recommendations

In addition to the recommendations embedded in the strengths and limitations of the campaign as well as the potential platforms for the campaign materials, participants had two main recommendations for the campaign moving forward. These included 1) more information about at-home genetic testing and 2) adding information on mental health concerns about genetic testing to the infographics. In addition, participants provided their thoughts on potential platforms that they believed college-aged women would utilize to access the BYB campaign.

At-Home Genetic Tests. With the convenience of at-home genetic tests on the rise, participants thought it would be good to include more information on the accuracy and reliability of these tests. One participant noted that her professor informed her class that they should not use

at-home genetic tests as they were not accurate while another participant noted feeling more comfortable doing an at-home test to avoid having to go to the doctor.

I think the only thing to think about is how easy it is to get tested, because I know you can do at-home tests, where they send a swab, so it's really easy. So maybe you should just make that clear. Because sometimes you don't want to go to the doctor, that type of thing.
(Focus Group F, Ashkenazi Jewish ancestry)

Perhaps having a story detailing someone's experience with an at-home test and subsequent visit with a genetic counselor may be helpful in understanding the benefits and risks of utilizing each option.

Mental Health Concerns. Participants also expressed a desire to add information on potential mental health issues one may experience in response to genetic testing on infographics or stories. They expressed the importance of this as taking the actual test or receiving the results could elicit emotions that could be detrimental to one's health. One participant noted:

The mental health aspect is important. I don't know if you have any information on mental health on the infographic, but even just a little thing recommending, hey, if you get tested and you're upset with your results, maybe see a counselor. You know? (Focus Group F, Ashkenazi Jewish ancestry)

Perhaps adding a story or an addition to an existing story can shed some light on each woman's emotional experience with genetic testing. This addition may encourage someone to take the step to talk to their health care provider about genetic counseling. Gavaruzzi et al. (2018) study supports this notion of using narratives in which the emotions of the protagonist are highlighted, along with standard information material, to promote the desired behavior.

Potential Platforms. Participants noted a host of different platforms for BYB videos and podcasts. Focus Group B (*Caucasian American*) felt strongly about hosting BYB videos on Facebook. They noted Facebook is one of the most popular social media platforms where college students watch videos. They also noted that they would be more likely to engage in these videos based on the emoji that was used in response to the video. For example, a video with a lot of “likes” or “hearts” would have a higher chance of being viewed. Focus Group F (*Ashkenazi Jewish ancestry*) also preferred Facebook and noted that its longevity would be a good place for BYB videos to have a lasting effect.

Focus Group A (*African American*) noted a strong preference for the BYB videos to be aired during Hulu commercials. Participants felt that Hulu has a broad audience of college students, and Hulu commercials would be an excellent opportunity to reach them, particularly since commercials cannot be skipped. Twitter commercials were also mentioned, but it was noted that there are time constraints on Twitter videos, and the shorter videos may not be as favorable. Focus Group D (*African American*), E (*Ashkenazi Jewish ancestry*), and F (*Ashkenazi Jewish ancestry*) mentioned Snapchat and Instagram as potential platforms for the BYB videos. An additional recommendation was made by Focus Group C (*Caucasian*), which was to have these videos loop in the University Health Center where students frequent and to possibly have the printed infographics available should the student need more information. These findings were also observed in the Dunn et al. (2018), where multiple groups tended to prefer different social media preferences. The final evaluation question takes into account the entire evaluation design and how it may be an effective design for future evaluations of such campaigns.

Effectiveness of Mixed-Methods CRE Study Design

The final evaluation question focused on determining the extent to which the mixed-method CRE design employed in this evaluation, along with the use of the narrative transportation theory within focus groups, is an effective methodology in evaluating online public health campaigns that utilize storytelling to convey health and risk messages.

The narrative transportation scale has demonstrated to be a valid instrument to assess one's transportation in a story. Research has noted how the narrative transportation theory has been used to help knowledge, belief, attitude, and behavior change through reduced counterarguing, connections with the characters, heightened perceptions of realism, story-relevant mental imagery, and emotional engagement (Green & Fitzgerald, 2017). However, an evaluation design, including a mixed-methods culturally responsive approach that utilizes the narrative transportation theory and focus groups, has been less studied. This evaluation sought to understand the benefits of such a design.

Cultural Responsiveness

Conducting a mixed-methods culturally responsive evaluation approach was beneficial in understanding the effectiveness of the BYB campaign within female college students of varying cultures and ethnicities. Cultural responsiveness was a crucial element in this approach as cultural resonance played a considerable role in narrative transportation. Besides having focus groups comprised of familiar faces with similar cultural backgrounds and demographics, it also contributed to the comfort of participants to speak freely about a sensitive topic. Many participants noted how comfortable they felt in discussing breast cancer risk factors amongst their sorority sisters.

Comfortable. I don't feel weird about it. Yeah. And like my gynecologist, is a guy. So, at the time when he was the one telling me like, oh, you have like a lump, I was like what are you talking about? Yeah, I don't know if you're feeling something right. Cause I thought it was the guy's like, yeah, you know, this is weird that he's having to be the one that told me. But you know, after that it made me more comfortable addressing it. (Focus Group B, Caucasian)

I feel like it made it more comfortable in some way. It was better that it was people I knew rather than somebody I didn't know. (Focus Group A, African American)

Additionally, many noted that they appreciated the fact that the focus groups were comprised of individuals they knew. This aspect also added to their level of comfort and allowed them to see different perspectives.

I'm really glad I asked [friend's name] to come. I think it definitely made the experience a lot better being able to talk about how we felt about it, and how we relate to it and see different aspects of their lives and how they think about it too. (Focus Group A, African American)

I was able to see multiple perspectives. Going back on people I knew felt better than being in a room with usually a majority population. (Focus Group A, African American)

There wasn't an emotional barrier. You can share your story about your aunt and when you talked about your mom. I feel like you wouldn't be so inclined to do that if it was people you didn't know. You just wouldn't open up like that. (Focus Group A, African American)

The comfort of participants facilitated their openness about such a sensitive topic. Adding focus groups to further elaborate on the narrative transportation scale was helpful in

understanding how narrative transportation occurred. Also, it facilitated an understanding of why some aspects of transportation were ranked higher than others. Both of these elements are crucial in understanding the effectiveness of the campaign. Research has shown that individuals who transport into a story have a greater likelihood of adopting the desired health behaviors noted in the story. Having an understanding of why or why this does not occur plays into whether or not the story achieving its intended purpose. From this evaluation, one is able to observe specific aspects of the story that potentially interrupted or delayed narrative transportation that could be modified to ensure effective transportation. As such, the proposed methodology of a mixed-method culturally responsive evaluation appears to be a promising approach for the evaluation of future campaigns that utilize storytelling to convey health messages.

This chapter provided the results and answered the evaluation questions proposed for this study. The following chapter will provide a detailed discussion of overall findings from the study, implications of storytelling in online public health campaigns, recommendations for the development of future online public health campaigns, and overall conclusions.

CHAPTER 5

DISCUSSION & CONCLUSION

The purpose of this study was three-fold. The first was to better understand the unique experiences of college-aged women's exposure to CDC's Bring Your Brave (BYB) public health campaign and how those experiences may or may not influence behavioral change. The second purpose of this evaluation was to study and/or improve upon previous efforts in the evaluation of online health campaigns by employing a mixed-methods culturally responsive evaluation design. This design includes a quantitative knowledge assessment before and after exposure to the BYB campaign and a qualitative focus group to better understand how increases in knowledge occur in response to narratives in the BYB campaign. The final purpose of this evaluation was to understand how the narrative transportation scale could be used to evaluate the effectiveness of the digital stories and podcast in the BYB campaign.

This culturally responsive evaluation was guided by the work of Hood, Hopson, and Kirkhart (2015). Their continued contributions to the field of evaluation reiterate the importance of being culturally responsive at every stage of the evaluation. This focused understanding of the importance of culture aided in the identification of its role in understanding the narrative transportation theory when applies to online public health campaigns. The effects of the narrative transportation theory (Green and Brock, 2000) were heightened in instances where cultural resonance was evident. Together, the findings in the literature review and expertise of the evaluation stakeholders shaped the researcher's understanding of the importance of cultural responsiveness in every step of the evaluation. Also, its relative importance in understanding the

effects of narrative transportation. This understanding facilitated the development of culturally responsive evaluation questions, as well as the ability to recognize any cultural underpinnings during data analysis.

The following section describes the main findings from this mixed-methods culturally responsive evaluation that contribute to the fields of public health communication, narrative transportation theory, and culturally responsive evaluation. Each of the main findings will be discussed in greater detail in the following sections. In addition, each main finding will cover relevant implications and recommendations for developing future online public health campaigns that utilize storytelling to convey health messages. This concludes the final step of the culturally responsive evaluation approach – the dissemination of future recommendations based on findings. In addition to this dissertation, an evaluation report will be written and disseminated to stakeholders and other appropriate audiences based on the findings and recommendations outlined in this chapter (step 9 of the CRE approach).

Summary of Main Findings

After reviewing the findings of this mixed-methods culturally responsive evaluation, four main findings emerged:

- 1) Online public health campaigns that utilize storytelling to convey health messages can produce immediate effects such as increasing knowledge and awareness of important health topics independent of various demographic variables such as age, family history or health behavior. This is dependent on a multitude of factors including resonance with the storyteller, clarity of the message and the storyline and authenticity of the story.
- 2) A story's mode of delivery can have a significant impact on the degree of narrative transportation irrespective of a user's personal preference. In this study, podcasts were an effective method to convey health messages despite a preference for digital video storytelling.
- 3) Culturally responsive focus groups can amplify the data from the narrative transportation scale to ascertain reasons behind the degree of narrative transportation. Further, when

sensitive topics are covered, focus groups comprised of peers may facilitate a more honest and productive discussion.

- 4) A mixed method, culturally responsive evaluation approach combined with the narrative transportation theory is a promising methodology for the evaluation of future online public health campaigns that utilize storytelling to convey health messages.

The following section will unpack each of these findings and provide some implications for its use and recommendations for future research. Study conclusions are provided immediately following this section.

Storytelling in Online Public Health Campaigns Increase Knowledge and Awareness

Findings from this evaluation demonstrated that participants experienced a significant increase in knowledge after exposure to the BYB campaign. This finding was independent of demographic variables of age, race/ethnicity, family history of cancer, or health behaviors after exposure to the campaign. Elements of resonance, clarity of the story, and the story's authenticity played a role in supporting narrative transportation to facilitate the absorption of the relevant information presented in the stories. Also, the presentation of infographics that were visually appealing and easy to understand also facilitated the absorption and retention of new information.

Implications

There were a few implications that one should consider when developing online public health campaigns that aim to increase knowledge and/or awareness. The following section will highlight the following implications: tailoring messages for a broad target audience, credibility of the story, and health literacy. This section will conclude with some overarching recommendations for developing such campaigns.

Tailoring messages for a broad target audience. Each of the videos and podcast presented in this evaluation included cues to action that were often missed by the study participants. These messages should be clear and easy to understand if there is a recommended behavior that should be adopted. Asbeek Brusse, Fransen and Smith (2017) noted the preventive health behaviors (e.g., physical activity, quitting smoking, and sunscreen use) can be regarded as having minimal risk because these behaviors are typically associated with safe and specific outcomes that often reduce the risk of a specific disease. Further, they note that these same preventive health behaviors may be perceived as risky by some (e.g., sunscreen use involves putting chemicals onto the body, quitting smoking may cause weight gain) instead of involving little risk in different populations (Asbeek Brusse, Fransen & Smit, 2017). Framing is vital when trying to convey the same message across multiple audiences.

When considering developing such campaigns on a broader scale, a few things must be considered. First, a health communication specialist should consider how messages are framed. Although the term framing has multiple meanings in the research literature, in health communication, framing indicates a way of presenting information that is either more negative (losses, prevention and undesirable attributes) or more positive (gains, promotion and desirable attributes). At the same time, the different descriptions are equivalent in informational content (Asbeek Brusse, Fransen & Smit, 2016). Message framing has been proven to be an effective health communication strategy for promoting behavior change across a wide variety of health behaviors. Prospect theory (Kahneman & Tversky, 1979 as cited in Asbeek Brusse et al., 2016) provides an explanation for the phenomenon that identical information can have different effects depending on how it is framed.

In contrast to disease prevention functions, behaviors that serve a disease detection function (e.g., mammography, colonoscopy, sexually transmitted disease [STD] screening) are more likely to be viewed as involving a higher degree of risk because of the possibility that a serious condition is discovered (Rothman & Salovey, 1997 as cited in Asbeek Brusse et al., 2016). This framing technique is more in alignment with the BYB campaign. Learning your family cancer history opens up the opportunity to learn more about your breast cancer risk, which may be perceived as a high risk. Not to mention the perceived risk of following up with a healthcare provider or getting genetic testing. Understanding the perceived risk of the target population helps frame the most appropriate message that alleviates the perceived risk. In this regard, Asbeek Brusse et al. (2016) suggested that gain-framed messages should be more compelling for illness prevention behaviors, and loss-framed messages should be more persuasive for illness detection behaviors. Individuals often scrutinize threatening messages, especially those that attempt to change their behavior. Counterarguing is a crucial obstacle to persuasive effects (Petty & Cacioppo, 1986, as cited in Ma et al., 2018). However, narrative persuasion shows that when viewers are sufficiently transported, the generation of counterarguments should be suppressed by a narrative (Moyer-Guse, 2008; Ma et al 2018).

Ma et al. (2018) examined the moderating role of message framing in narrative persuasion in the context of CDC's Tips From Former Smokers campaign. The Tips for Former Smokers Campaign was launched in 2012 and featured compelling stories of either former smokers who are suffering from smoking-related diseases and disabilities or nonsmokers who are dealing with health issues caused by secondhand smoking exposure (Ma et al., 2018). The use of real stories of real people was powerful by showing the everyday experiences of those who live with severe health consequences caused by smoking or exposure to secondhand smoking.

According to a study published in *The Lancet*, the Tips campaign motivated more than 100,000 smokers to refrain from smoking, an estimated 1.64 million smokers to make a quitting attempt and more than 6 million nonsmokers talked about the dangers of smoking with their friends and family (McAfee, Davis, Alexander, Pechacek & Bunnell, 2013 as cited in Ma et al., 2018). The initial success of the campaign is mostly attributed to the power of narrative persuasion, which, according to recent research, holds promise in influencing the public's health-related beliefs, attitudes, and behaviors (Ma et al., 2018). Interestingly, the success of the campaign is based on more negative stories of former smokers and not the positive ones typically seen in narrative health communication.

Credibility of the Story. Study participants appreciated hearing actual experiences over statistical information regardless of its accuracy. In fact, during this study, it was observed that women started to physically feel their breasts when Meagan talked about finding a lump in her breast. In BYB, having stories of real women who have experienced breast cancer may carry more weight than those messages that are statistical in nature. Credibility is an important factor when considering the narrative source. For BYB, the credibility of the young women's stories is imperative. The realness and honesty of the women in the digital stories can have a profound effect on the viewer to elicit symptoms of sympathy, compassion, and empowerment.

Participants in this evaluation reported that both the videos and podcast felt like real stories, and it was implied that the stories were credible. The "realness" of the stories made them more relatable to participants. Research noted credibility can be observed with actors; however, the impact lies in their ability to transport the viewer in the space in which the story resonates. When study participants viewed the videos of both Emily and Caroline and Jackie, many expressed a sense of empowerment knowing these were the women who actually lived these

experiences. Participants who felt the emotion of empowerment may have felt more inclined to take action of their own health. Future evaluations should include a question in the focus group or post-assessment to gather additional information about the credibility of the stories, particularly as they relate to narrative transportation. Also, it may be worthwhile to play truthful stories using actors as well as fictitious stories with actors to evaluate the differences in narrative transportation.

Hasse et al. (2015) examined how inaccurate information in health messaging in narratives can have detrimental effects. Haase et al. (2015) note a typical strategy of anti-vaccination activists is to promote emotional narratives from and about individuals, preferably children, who have been harmed by vaccinations. The use of these fear appeals is used to persuade parents to reject vaccinations. Haase et al. (2015) state that little is known regarding the importance of the sources that communicate the narrative and statistical information. Research in the field has shown that the credibility of an information source may serve as a cue to discount or augment the communicated message (Hovland & Weiss, 1951; Pornpitakpan, 2004 as cited in Haase et al., 2015). Hasse et al. (2015) state, “irrespective of the amount of information learned from a source, the persuasive impact of the provided information may be significantly smaller if the source is perceived to be low in credibility (discounting); at the same time, the persuasive impact may be significantly greater if the source is perceived to be highly credible (augmenting).” In Haase et al.’s (2015) study, researchers sought to assess the potential moderating effect of statistic and narrative source credibility on the narrative bias. In all conditions, the authors observed a stable narrative bias: even though participants had statistical information about the occurrence of vaccine adverse events (VAE), normatively irrelevant information conveyed by narratives from online discussion boards systematically increased

perceptions of vaccination rates (Haase et al., 2015). Interestingly, informing participants that the statistical information was based on unreliable or very reliable data did not moderate the narrative bias. Narrative bias occurred irrespective of whether the narratives originated from an anti-vaccination website or a neutral health forum. Thus, it appears that informing individuals about the credibility of different types of risk information does not affect the integration thereof (Haase et al., 2015).

Health Literacy. One of the main sentiments that study participants had regarding the stories was the use of medical jargon. Often times, health messages are disseminated with the premise that the audience has a basic understanding of the health topic to further process the information in the stories or health literacy. Health literacy can be defined as the degree to which individuals can obtain, process, and understand basic health information and services needed to make appropriate health decisions (Beaunoyer et al., 2017). “This concept of health literacy not only implies the ability of patients to seek and understand health information but also involves the capacity to evaluate and to use the information to make sound decisions about health-related issues” (Beaumoyer et al., 2017). Health information literacy in the United States is low as ‘nearly half of all-American adults – 90 million people’ – have difficulty understanding and acting upon health information (Basch et al., 2018). While the Institute of Medicine recommends, health information be written for the sixth-grade reading level, the reading level required to understand information published on the Internet is much higher than these suggested guidelines (Basch et al., 2018). As such, PIF suggests that developers keep language clear and simple, break complex information down into smaller parts, use layout and design to aid navigation, and ensure that any communication needs of the audience are met (PIF, 2015).

Recommendations for Future Research

Storytelling can be a useful tool in health messaging and may have the potential to elicit change attitudes and behaviors. Future studies should conduct culturally responsive focus groups to test and evaluate narrative health messages before they are disseminated to the general public. Also, researchers should ensure the culturally responsive focus groups are reflective of the target population and resulting messages should be tested on resonance, clarity, and the authenticity of the story. These elements facilitate narrative transportation, which can potentially lead to changes in attitudes and behaviors.

Mode of Delivery – Audio or Visual?

Podcasts are an innovative mode of delivering health messages. Health communication specialists should consider their use as they are quick, inexpensive, and easily accessible to users. Health communication specialists should be cautioned that podcasts may only appeal to specific audiences; however, there can be great opportunities for those who are avid podcast listeners.

Implications

The following section will discuss implications as they relate to the use of audio or visual digital stories in online public health campaigns. These implications include determining the mode of delivery – video versus audio, and the use of familiar voices in podcasts. The section concludes with recommendations for future online public health campaigns.

Video vs. Audio. An interesting finding from this study was that Meagan’s podcast resulted in a significantly higher transportation score than the two videos included in the study. Perks et al. (2019) suggest that audio transportation may function different than visual transportation as audio immersion allows the imagination to run free. It’s interesting to note that this was an unexpected finding, as most participants preferred the video stories over the podcast

stories. Digital storytelling occurs across both video and audio platforms. Interestingly, there has little to no research conducted in this area to investigate if one platform elicits a greater response in the viewer than the other. Future research is needed in this area, as podcasts are becoming a more accessible way to share digital stories. In a sense, podcasts take away some of the implications emphasized earlier around cultural resonance. Podcasts provide direct audio stimulation and some indirect visual stimulation (visualizing the narrative source's story). In an attempt to better understand the phenomenon in the absence of research, the researcher listened to several podcasts related to breast cancer and compared them to comparable visual digital stories on YouTube. Both podcasts and YouTube videos have user ratings, and podcasts are rated more frequently than YouTube videos. When the narrative source of the podcast was unknown as far as a photo to visually identify the podcaster, the ratings were significantly higher, and there were a high number of qualitative comments. When the narrative source of podcasts was identified through a photo or other mechanism, the ratings were still high, though qualitative comments were low.

Interestingly, when the researcher viewed similar videos on YouTube, there were low ratings compared to the number of views the video received and very few comments. It appears that podcasts may have an opportunity to reach a broader target audience without as many modifications for cultural resonance. Future research should incorporate focus group user feedback to ascertain any differences in the receipt of health information between these two mechanisms.

Familiar Voices on Podcasts. Study participants reported resonance with Meagan's podcast because she was a college student, and there were several parallels with the study participants and Meagan. Although her voice was not familiar in the sense of an acquaintance,

the age of her voice resonated with participants as a fellow college student or classmate. Perhaps having a familiar voice in podcasts that eliminates the demographic barriers of age and gender would be to include voices that are familiar to the target population or the general public.

Many health campaigns and other forms of narrative communication have utilized celebrities as the storyteller to heighten awareness on a particular issue. Angelina Jolie's announcement of her decision to undergo a preventive bilateral mastectomy due to her high genetic risk of developing breast cancer (Dean, 2016) sparked a huge interest in the topic. In fact, many governmental and breast cancer organization website noted an increase in traffic to their sites where information on the BRCA genes was located (Dean, 2016). This technique has also been used in other countries outside the United States. In China, breast cancer has become the most common strain of cancer. It is the fourth leading cause of cancer-related death among Chinese females (Chen & Yang, 2018). Even though Chinese females are at high risk for breast cancer, most of them have inadequate knowledge about breast cancer (Chen & Yang, 2018). To increase awareness and educate Chinese women around the issue, researchers launched breast cancer campaigns that focus on organizing offline activities, such as inviting female celebrities to participate in social welfare activities to attract public attention of this issue. This technique could be instrumental in health messaging that embodies some fear appeal, as with the BYB campaign. Angelina Jolie's announcement definitely raised awareness of genetic testing and preventive options. The announcement motivated women at risk to educate themselves on their health options. Adding a celebrity to podcast may lead to greater visibility of the desired health message. It may result in an increase in knowledge, awareness or behavior change. In addition, it may invite new listeners to the idea of podcasts.

Recommendations for Future Research

Health communication specialists should consider ways to utilize podcasts to share health messages. While many of the participants in this study noted that they would probably not seek out a podcast like Meagan's in the BYB Campaign, there may be other opportunities to spread health messages to those users. Health communication specialists may consider partnering with existing popular podcasts that appeal to their target population to co-host or guest host a special segment on their desired health message/topic. This is similar to what is observed in entertainment-education in movies or television shows that highlight a specific health issue. In this aspect, the focus isn't on a specific demographic resonance, but an identification with the podcast itself.

Adding Culturally Responsive Focus Groups to the Narrative Transportation Scale

The addition of culturally responsive focus groups to the results of the narrative transportation scale was beneficial in deepening our understanding of how narrative transportation occurs in response to the BYB videos and podcast. Previous research studies have relied solely on the narrative transportation scale while very few have added focus groups to explore these experiences. Participants in this study appreciated the opportunity to participate in focus groups with their peers, particularly about the sensitive nature of the topic. Participants noted that this contributed to a more honest and authentic conversation within the focus groups.

Implications

The focus groups facilitated an understanding of various elements that contributed to higher narrative transportation. Implications for adding culturally responsive focus groups to the narrative transportation scale include cultural resonance, impactful stories, and involving users of

the campaign throughout its production. This section concludes with recommendations for the inclusion of culturally responsive focus groups in an evaluation.

Cultural Resonance. The BYB targets a specific audience in its health messaging: young women aged 18-44. There is also a particular emphasis on including young women with a family history of breast and ovarian cancer as well as African American and Ashkenazi Jewish women. Materials developed for this target audience should resemble the target audience as it relates to age, ethnicity, and culture. Many of the focus group responses received from previous online testing noted that women appeal more to materials that are culturally relevant to them. In this study, the use of culturally responsive focus groups was imperative to understanding the relevance of BYB materials for this population. Focus groups comprised of primarily African American women tended to resonate with Jackie's story despite her being a mother which in turn was the reason why there was no resonance to the Emily and Caroline video. There were cultural or personal aspects that were noted as additional reasons for resonance. Many assumed that Jackie was a single mom and felt they could relate growing up in single-parent households. Particularly how the mother makes sacrifices for her children as portrayed in Jackie's video. While culturally responsive focus groups can be challenging to do on a larger scale, the data generated will provide a wealth of information for the development of health messages. Diversifying focus groups for those health messages to the general public may also be informative in tailoring health messages.

Culturally Impactful Stories. One of the most consistent themes for the BYB videos was the desire to know how the story ended. Although both videos were relatively short in duration, nearly every focus group cited a desire to learn more about the story. This included a desire to know how it ended, how medical decisions were made, and the emotional impact of

them and how family members coped with these decisions. Focus groups that were comprised of mostly Caucasian or Ashkenazi Jewish ancestry desired these aspects for Emily and Caroline's video, and focus groups consisting of African American or multicultural ethnicities expressed the desire to know these aspects of Jackie's video. The desire to know more about the story is one of the narrative transportation scale items. It has a direct impact on the degree of narrative transportation. Culturally impactful stories appear to drive this desire and should be further explored in future studies. It draws the question of what level of detail is needed in a story to elicit this desire to further transport one into a story. It would be interesting to add these elements to future studies to assist story developers with the critical components of a story that drive narrative transportation.

To ensure the information has impact and relevance, the content developer must create resources with a specific purpose or objective, understand and meet the needs of your users, include non-clinical information and patient experiences, and make information easy to find and access (PIF, 2015). The power of storytelling has been noted as an effective communication tool in the healthcare environment (Lareau & Miczo, 2017). Stories around managing illness experiences or caregiving may provide social meanings that help patients make sense of their own experiences (Lareau & Miczo, 2017). Stories of online experiences can lead to mixed emotional reactions (compassion and fear). Still, they can be beneficial in helping the online health information users make informed decisions (Lauckner, 2016). Developers may also consider the use of stories to create impactful health information content.

Including Users in Campaign Development. Previous formative evaluations of the BYB included the involvement of women representing the target populations to provide feedback on BYB materials to ensure they were culturally responsive and appealing to the target

audience. This study contributed to additional input from the perspective of college-aged women within the BYB target population.

It is imperative to involve users in creating information at every stage of your information project, include a range of representative users, and ensure clear communication with engaged users. Findings from the Jiang and Street (2017) study suggest that effective dissemination of information is more than producing message content that is culturally, socially, and personally appropriate for an audience. Users' experiences using the Internet and navigating information environments are a critical aspect of understanding site usability. Thus, it is important that health communicators "design online information environments that streamline and simplify access to health-promoting messages in addition to producing content that is understandable, credible and not overwhelming" (Jiang & Street, 2017). Developers should engage in usability testing with the target audience to ensure that message content is culturally, socially, and personally appropriate.

Recommendations for Future Research

In addition to the recommendations implied in the implications listed above, including culturally responsive focus groups affords the campaign developers the ability to better understand or reveal cultural practices that may not be evident in the literature. Often times, developers utilize the literature to inform the development of such campaigns; however, certain cultural aspects may not be found in the literature. Including these individuals in focus groups and including them in the development of the campaign will ensure the resulting information is culturally responsive. In addition, having a moderator, notetaker, or another researcher who represents the target audience on the study team would be helpful. This person could also ensure

the cultural responsiveness of the data analysis and data reporting components of subsequent evaluations of the campaign.

Mixed-Method Culturally Responsive Evaluation & Narrative Transportation Theory

This study utilized a novel evaluation approach that combined a mixed-methods culturally responsive evaluation with the narrative transportation theory. There were many benefits to using this approach to determine the effectiveness of the stories in the BYB campaign. Not only does this approach help determine effectiveness, but it also provides an opportunity to gather the information that can be used to enhance the stories to facilitate greater narrative transportation to likely increase the likelihood of attitude or behavior change. This data may not be available using the Narrative Transportation Scale singlehandedly. Data from the added qualitative component provided details about the story that could be improved to enhance narrative transportation. In addition, the mixed-methods CRE approach provided indicators to measure the attainment of campaign outcomes. As noted previously, the BYB campaign has four main objectives:

1. Encourage young women to learn their family history of breast and ovarian cancer.
2. Educate young women on the risk factors for breast cancer before the age of 45.
3. Inspire young women to talk to their health care provider if they think they may be at a higher risk for breast cancer.
4. Encourage young women to live a healthy lifestyle and be aware of the own breast health (CDC, 2020).

Each of these outcomes could be measured with the mixed-methods CRE approach. While we did not ask specific questions on learning one's family history, many of the participants discussed their desire to do so within the focus groups. Study participants were educated on the

risk factors for breast cancer before the age of 45 as evidenced in the significant increase in knowledge after exposure to the BYB campaign. Ninety-five percent of participants were inspired to talk to their health care provider about their breast cancer risk after exposure to the BYB campaign. Lastly, seventy-nine percent of participants indicated a desire to engage in healthy behaviors after exposure to the BYB campaign.

While this study did not examine differences in attitudes, it should be considered in future evaluations of similar campaigns. To develop health information that encourages behavior change, the user must have experience that aligns with the direction of the message. This is particularly why culturally responsive focus groups are so important in crafting health information and messages.

Implications

As a novel approach, there are several implications to using this approach. First, mixed-methods studies are often time-consuming and require much attention to detail. Adding an element of cultural responsiveness adds to the complexity of this methodology. Particularly if the campaign targets a hard-to-reach population. Second, this approach can be challenging to implement on a broader scale. Recruitment of focus group participants will need to be specific as including members from the general public may not capture aspects of culture for specific populations. It should be recognized that this may require a larger number of focus groups of different cultures, which could be rather expensive and time-consuming. In addition, it may be challenging to tailor stories to every culture in the target audience. In this aspect, focus groups should assess other areas of resonance that may facilitate narrative transportation. For example, in this study, Meagan's podcast elicited resonance as a college student. No participants reported a cultural resonance with Meagan as an Asian American woman.

Recommendations for Future Research

It is recommended to include cultural responsiveness in every level of the evaluation and to plan ahead to anticipate the time and resources that will be required. Data integration is critical to the success of a mixed-methods approach. This approach appears to work well with campaigns that have a target audience limited in scope. Future research should investigate how this approach can be used in campaigns targeting the general public.

Summary

In summary, this culturally responsive mixed-methods evaluation demonstrated that online public health campaigns that utilize storytelling as a method to disseminate health messages and cues to action have the power to increase knowledge and potentially change behavior. The potential to change behavior is purely dependent on the degree of narrative transportation that occurs in response to viewing or hearing a narrative health message. The incorporation of culturally responsive focus group unveiled additional culture underpinnings that facilitate narrative transportation. These results suggest that this novel methodology, may be effective in evaluating the effectiveness of online public health campaigns.

Policy Considerations

The ability to convey the effectiveness of federally funded programs or online public health campaign is essential for the future implementation of the campaign. The BYB is of particularly importance as its funding is directly tied to the Young Women's Breast Health Education and Awareness Requires Learning Young (EARLY) Act. The findings from this evaluation support the need for additional resources for the development of culturally responsive materials to enhance the reach and receipt of important health messages. The data from such evaluations may have the ability to inform future policy development and implementation.

In addition, the findings from this evaluation may lend itself to curriculum changes in health-related courses within colleges and universities across the United States. Health-related courses may provide an opportunity to educate college students about potential cancer risk-reducing behaviors that can be adopted during their college years. While education on healthy behaviors may be a part of the current curriculum, marketing it as a way to reduce their risk of cancer may provide an additional benefit.

Limitations

One of the strengths of utilizing this evaluation approach is that it is a mixed-method approach to garner information from multiple sources. However, despite this advantage, mixed-methods evaluations can be complex, and integration of qualitative and quantitative data can be challenging (Wisdom & Creswell, 2013). For example, analyzing and reporting the data can be labor intensive and require greater resources (Wisdom & Creswell, 2013). Due to the relatively small sample size, through use of convenience sampling, for each target audience of the campaign, the findings do not necessarily generate a representative sample and cannot be generalized to all women in similar demographic segments. In addition, many of the quantitative questions about health are all self-report and may or may not be accurate particularly for sensitive questions. For example, students may not accurately depict their consumption of alcohol particularly if they are underage.

Conclusion

The development of online health information is an iterative process that involves understanding the user as well as how the user interacts with the information. Developers must continuously monitor and evaluate their campaigns and/or health messages to ensure credibility, usability and accuracy of health information. Developers may also utilize assessment tools as

described in Whitten, Nazione & Lauckner (2013) that highlight constructs of design, information validity, motivational health content and literacy components. The engagement of each party along with government institutes and researchers (Alnemer et al., 2015) will help developers understand how to effectively create health information that is user-friendly, comprehensible, viable and easily accessible.

Storytelling can be beneficial in health promotion as it relates to increasing awareness, knowledge and behavior change. While behavior change is often difficult, certain components of the campaign that transport the viewer can be utilized to encourage behavior change. Research on perceptions of the narrative source on message effectiveness is very limited and has not been well studied. Future research should examine the role of the narrative source in future evaluations of narrative communications or health campaigns.

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Friedlander, M.L., Weideman, P.C., Glendon, G., Nesci, S., kConFab Investigators, Andrulis, I.L., Buys, S.S., John, E.M., MacInnis, R.J., Hopper, J.L. & Terry, M.B. (2019) Alcohol consumption, cigarette smoking and familial breast cancer risk: findings from the Prospective Family Study Cohort (ProF-SC), *Breast Cancer Research*, 21, 1-14

APPENDIX A

IRB Exempt Determination Letter



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Human Research Protection Program

EXEMPT DETERMINATION

October 14, 2019

Dear [Jori Hall](#):

On 10/14/2019, the Human Subjects Office reviewed the following submission:

Title of Study:	Harnessing the Power of Storytelling in Online Public Health Campaigns: An Evaluation of the Bring Your Brave Campaign
Investigator:	Jori Hall
Co-Investigator:	Monique Young
IRB ID:	PROJECT00000511
Review Category:	DHHS Exempt 3C

We have approved the protocol from 10/14/2019 to 10/13/2024.

This project has received Limited IRB Review. It has been determined that there are adequate provisions to protect the privacy of participants and to maintain the confidentiality of data. Changes to study procedures that affect privacy and confidentiality must be made by submitting a modification. You can keep us informed of changes that do not affect the risk of the study, the privacy of participants, or confidentiality of data by using the "Add Public Comment" button on the main study page. See Appendix C of the Exempt Research Policy: <https://research.uga.edu/docs/policies/compliance/hso/IRBExempt-Review.pdf>

If you will be conducting the research on-site at a sorority house or building that you do not normally have research rights at, you will need to obtain written authorization from that sorority's president or leader before doing so. When you have received that written authorization (pdf of an email is fine), please upload it to the main study page by clicking Add Public Comment before conducting research activities at that site.

Please close this study when it is complete.

Commit to Georgia | give.uga.edu

An Equal Opportunity, Affirmative Action, Veteran, Disability Institution

APPENDIX B

RECRUITMENT EMAIL

Good Afternoon [Student Name],

I hope this email finds you well. My name is Monique Young and I am a graduate student in the College of Education here at the University of Georgia. I am writing you to invite you and your sorority sisters to participate in my upcoming research study to evaluate the effectiveness of a recent online public health campaign about breast cancer. The purpose of this evaluation is to better understand the unique experiences of college aged women's exposure to the online public health campaign and how college women perceive their breast cancer risk.

You are eligible to participate in this study if you:

- Identify as female
- Are at least 18 years of age or older

If you are willing to participate, you will be asked to complete an 8-10 minute pre-assessment survey, engage in a 40 minute focus group discussion (5-6 people) after viewing videos related to the online public health campaign and a 5 minute post-assessment survey. The focus group session will be audio recorded, however, these recordings will be deleted after audio has been transcribed. All efforts will be made to ensure anonymity and confidentiality. If you do not want to answer any of the questions during the pre- or post-assessment survey or the focus group, you may choose not to do so. Your participation in this research study will be one time only and completely voluntary.

To thank you for your time, you will be compensated with a \$15 Amazon gift card for your participation in the study.

I currently have a few dates scheduled for upcoming focus groups on campus in the Tate Center. These dates/times are shown below:

Saturday, February 9th (10-11am, 11-12, 1-2, 2-3)

Thursday, February 13th (5-6, 6-7, 7-8)

Monday, February 17th (2-3, 4-5, 5-6, 6-7, 7-8)

*Refreshments will be served at the focus group.

Please send me an email if you are interested in participating in any of the times listed above. I can also arrange a special focus group session for your sorority perhaps after an existing event/meeting if there is

interest. Please send me an email and we can arrange a date/time. Your name/email will not be associated with your participation in the focus group.

The information that is obtained from this focus group provides valuable information that will lead us to understand how college women perceive and understand their breast cancer risk. This information can be used to improve future health education materials for this important population. I appreciate your time and consideration.

Please share this invitation with your sorority sisters.

Thank you,

Monique

Monique Young, MPH

PhD Candidate

College of Education | Qualitative Research & Evaluation Methodologies

850 College Station Road

Athens, Georgia 30602

APPENDIX C
PRE-TEST ASSESSMENT



PRE-TEST ASSESSMENT

PT# _ _ _ _

DEMOGRAPHICS

1. Please indicate your age in years:

2. What is your current year in school?

- ☐ Freshman
- ☐ Sophomore
- ☐ Junior
- ☐ Senior
- ☐ Graduate student

3. What is your gender?

- ☐ Female
- ☐ Male
- ☐ Transgender
- ☐ Other (Please specify: _____)
- ☐ Prefer Not to Say

4. Which of the following describes you? Check all that apply.

- ☐ African American
- ☐ American Indian or Alaskan Native
- ☐ Asian or Pacific Islander
- ☐ Caucasian/White
- ☐ Hispanic or Latino

- ☐ Ashkenazi (Eastern European) Jewish Ancestry
- ☐ Other (Please Specify): _____

FAMILY HISTORY OF CANCER

5. Have any of your close family members (parents, siblings, grandparents, aunts or uncles) been diagnosed with any of the following? Check all that apply.

- ☐ Breast cancer diagnosed at age 45 or under
- ☐ Triple negative (ER/PR/her2-) breast cancer diagnosed at age 60 or under
- ☐ More than one breast cancer in one relative (cancer in both breasts, or two separate breast cancers in one breast)
- ☐ Male breast cancer
- ☐ Two or more relatives with breast cancer, with at least one of the diagnoses at age 50 or under
- ☐ Ovarian cancer, primary peritoneal cancer, or fallopian tube cancer
- ☐ Pancreatic cancer
- ☐ Metastatic prostate cancer
- ☐ I don't know
- ☐ None of the above

CURRENT HEALTH BEHAVIORS

6. What's your height and weight?

Height (in inches)

Weight (in pounds)

7. Approximately, how many days per week do you exercise or participate in physical activity?

- ☐ Less than once per week
- ☐ Once a week
- ☐ 2-3 times per week
- ☐ 4-5 times per week
- ☐ 6 or more times per week
- ☐ I do not exercise or participate in physical activity

8. Approximately, how long do you typically exercise or participate in physical activity on a typical day?

- ☐ Less than 15 minutes
- ☐ 15-29 minutes
- ☐ 30-44 minutes
- ☐ 45-59 minutes
- ☐ 60 or minutes

- ☐ I do not exercise or participate in physical activity

9. Do you currently smoke? (This includes cigarettes, vapes or hookah)

- ☐ Yes
- ☐ No

10. During the past 30 days, have you had at least one drink of any alcoholic beverage such as beer, wine, a malt beverage or liquor?

- ☐ Yes
- ☐ No
- ☐ Don't Know/Not sure

11. During the past 30 days, how many days per week OR per month did you at least have one drink of any alcoholic beverage? Please answer once.

Days per week:

Days per month:

12. How old were you when you got your period?

- ☐ Under 12
- ☐ 12 or older
- ☐ I don't recall

13. Have you had genetic testing for a mutation linked to breast and/or ovarian cancer?

- ☐ Yes
- ☐ No

14. Would you say that in general your health is

- ☐ Excellent
- ☐ Very good
- ☐ Average
- ☐ Fair
- ☐ Poor

HEALTHCARE VISITS

15. When was your last visit to a primary care physician or gynecologist? Check the appropriate box.

- ☐ Less than 6 months
- ☐ 6 – 12 months
- ☐ 1-2 years
- ☐ 3-5 years
- ☐ More than 5 years

- ☐ I have not seen a physician

16. Have you talked with your doctor about what your family history of breast cancer might mean for your own health and cancer risk?

- No (Skip to Question 18)
- Yes, we've talked about this a little
- Yes, we've talked about this in depth

17. How satisfied are you with the level of communication you have had with your doctor about your family's history of cancer and your own cancer risk?

- Very satisfied
- Satisfied
- Neither
- Dissatisfied
- Very dissatisfied

THOUGHTS ABOUT BREAST CANCER

18. Please indicate your level of agreement/disagreement with the following:

	Strongly Agree	Agree	Neither Agree Nor Disagree	Disagree	Strongly Disagree
It is extremely likely I will get breast cancer in the future	0	0	0	0	0
I feel I will get breast cancer in the future.	0	0	0	0	0
There is a good possibility I will get breast cancer in the next 10 years.	0	0	0	0	0
My chances of getting breast cancer are great.	0	0	0	0	0
I am more likely than the average woman to get breast cancer.	0	0	0	0	0
The thought of breast cancer scares me.	0	0	0	0	0
Problems I would experience with breast cancer would last a long time.	0	0	0	0	0

If I had breast cancer my whole life would change.	☐	☐	☐	☐	☐
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BREAST CANCER KNOWLEDGE

19. Breast cancer is the most common cancer in American women. True False
20. Breast cancer is less common in younger women than older women. True False
21. BRCA gene mutations do not increase one's risk for breast, ovarian or other cancers. True False
22. Healthy Lifestyle choices such as maintaining a healthy weight and exercising regularly decreases the risk for breast cancer. True False
23. Having close relatives who were diagnosed with breast or ovarian cancer (particularly at age 45 or younger) puts you at a higher risk for getting breast cancer. True False
24. Talking to my healthcare provider can be helpful in managing my breast cancer risk. True False
25. Breastfeeding reduces my risk of getting breast cancer. True False

APPENDIX D

POST-TEST ASSESSMENT

POST-TEST ASSESSMENT

PT# _ _ _ _



BREAST CANCER KNOWLEDGE

1. Breast cancer is the most common cancer in American women. True False
2. Breast cancer is less common in younger women than older women. True False
3. BRCA gene mutations do not increase one's risk for breast, ovarian or other cancers. True False
4. Healthy Lifestyle choices such as maintaining a healthy weight and exercising regularly decreases the risk for breast cancer. True False
5. Having close relatives who were diagnosed with breast or ovarian cancer (particularly at age 45 or younger) puts you at a higher risk for getting breast cancer. True False
6. Talking to my healthcare provider can be helpful in managing my breast cancer risk. True False
7. Breastfeeding reduces my risk of getting breast cancer. True False

Bring Your Brave Campaign

8. How likely are you to talk to your family about your family history of breast or ovarian after hearing the Bring Your Brave stories? Circle one.

Very likely Moderately Likely Neither Likely or Unlikely Moderately Unlikely Very Unlikely

9. How likely are you to talk to your healthcare provider about your breast cancer risk after hearing the Bring Your Brave stories? Circle one.

Very likely Moderately Likely Neither Likely or Unlikely Moderately Unlikely Very Unlikely

10. How likely are you to engage in healthy behaviors (reducing alcohol consumption, eating a healthy diet, etc.) to reduce your chances of getting breast cancer after viewing the Bring Your Brave stories? Circle one.

Very likely Moderately Likely Neither Likely or Unlikely Moderately Unlikely Very Unlikely

11. Do you have any additional comments about the Bring Your Brave campaign?

APPENDIX E

NARRATIVE TRANSPORTATION SCALES

TRANSPORTATION – EMILY & CAROLINE

PT# _ _ _ _



Circle the number under each question that best represents your opinion about the narrative you just viewed.

	1 Not at all	2	3	4	5	6	7 Very much
1. While I was viewing the story, I could easily picture the events in it taking place.	1	2	3	4	5	6	7
2. While I was viewing the story, activity going on in the room around me was on my mind.	1	2	3	4	5	6	7
3. I could picture myself in the scene of events described in the story.	1	2	3	4	5	6	7
4. I was mentally involved in the narrative while viewing it.	1	2	3	4	5	6	7
5. After the story ended, I found it easy to put it out of my mind.	1	2	3	4	5	6	7
6. I wanted to learn how the story ended.	1	2	3	4	5	6	7
7. The story affected me emotionally.	1	2	3	4	5	6	7
8. I found myself thinking of ways the story could have turned out differently.	1	2	3	4	5	6	7
9. I found my mind wandering while viewing the story.	1	2	3	4	5	6	7
10. The events in the story are relevant to my everyday life.	1	2	3	4	5	6	7
11. The events in the story have changed my life.	1	2	3	4	5	6	7



TRANSPORTATION – JACKIE

PT# _ _ _ _

Circle the number under each question that best represents your opinion about the narrative you just viewed.

	1 Not at all	2	3	4	5	6	7 Very much
1. While I was viewing the story, I could easily picture the events in it taking place.	1	2	3	4	5	6	7
2. While I was viewing the story, activity going on in the room around me was on my mind.	1	2	3	4	5	6	7
3. I could picture myself in the scene of events described in the story.	1	2	3	4	5	6	7
4. I was mentally involved in the narrative while viewing it.	1	2	3	4	5	6	7
5. After the story ended, I found it easy to put it out of my mind.	1	2	3	4	5	6	7
6. I wanted to learn how the story ended.	1	2	3	4	5	6	7
7. The story affected me emotionally.	1	2	3	4	5	6	7
8. I found myself thinking of ways the story could have turned out differently.	1	2	3	4	5	6	7
9. I found my mind wandering while viewing the story.	1	2	3	4	5	6	7
10. The events in the story are relevant to my everyday life.	1	2	3	4	5	6	7
11. The events in the story have changed my life.	1	2	3	4	5	6	7



TRANSPORTATION – MEGAN

PT# _ _ _ _

Circle the number under each question that best represents your opinion about the narrative you just viewed.

	1 Not at all	2	3	4	5	6	7 Very much
1. While I was listening the story, I could easily picture the events in it taking place.	1	2	3	4	5	6	7
2. While I was listening the story, activity going on in the room around me was on my mind.	1	2	3	4	5	6	7
3. I could picture myself in the scene of events described in the story.	1	2	3	4	5	6	7
4. I was mentally involved in the narrative while listening to it.	1	2	3	4	5	6	7
5. After the story ended, I found it easy to put it out of my mind.	1	2	3	4	5	6	7
6. I wanted to learn how the story ended.	1	2	3	4	5	6	7
7. The story affected me emotionally.	1	2	3	4	5	6	7
8. I found myself thinking of ways the story could have turned out differently.	1	2	3	4	5	6	7
9. I found my mind wandering while listening the story.	1	2	3	4	5	6	7
10. The events in the story are relevant to my everyday life.	1	2	3	4	5	6	7
11. The events in the story have changed my life.	1	2	3	4	5	6	7
12. I had a vivid mental image of Megan	1	2	3	4	5	6	7

APPENDIX F

FOCUS GROUP INTERVIEW GUIDE



Focus Group Interview Guide

Harnessing the Power of Storytelling in Online Public Health Campaigns:
An Evaluation of the Bring Your Brave Campaign

Study Participation Guidance

Focus groups will be held with approximately 4-6 participants during the Spring 2020 semester at the University of Georgia. Focus groups will be held on campus at the Tate Center or at a location convenient for each focus group of participants. Focus groups will be scheduled for an hour recognizing the focus group may be a bit shorter. Once the focus groups were confirmed, the researcher will reserve space in the Tate Center or the Zell B. Miller Learning Center (MLC) unless scheduled in an alternate location. Researcher will arrive 10-15 minutes prior to focus group time to set up logistics before focus group participants arrive. Researcher will introduce herself to the focus group using the following script.

Thank you for meeting with me today. My name is Monique Young and I am a doctoral student in the College of Education at the University of Georgia. Thank you for your willingness to participate in this study. I am interested in learning how college students experience the Bring Your Brave Campaign.

Before we discuss the details of the study and review the informed consent, I would like you to know that all information you share with me will be kept confidential as noted in the consent form. I will not use your name or tie your person information in any way to reveal your identity. If you feel uncomfortable at any time during the focus group session, you may withdraw your participation at any time. The focus group session should take approximately 45 minutes to an hour. To compensate you for your time, you will be given a \$15 Amazon gift card. If you have

any questions at any time during this project, feel free to ask. Before we discuss the study details, do you have any questions?

Researcher will provide brief details of the study and review informed consent. Allow participants time to review the informed consent, have them sign then the researcher signs and provides a copy to study participants.

After receiving signed informed consents, pass out the pre-assessments to each of the study participants. Provide a brief overview of the assessment and allow the participants' time to complete the assessment. After completion, the researcher will collect the pre-assessments.

FOCUS GROUP SESSION BEGINS

Before we get started, I would like to record our conversation today to be sure I captured all of your comments. Do I have your permission to record today's session?

If participants agree, [start recording]

Each group of focus group participants will review a total of 2 story videos and one podcast to view/listen. The videos feature real women's stories. Each video will be viewed, discussed and assessed one at a time. Immediately following each video and podcasts, participants will complete the narrative transportation scales.

The following procedure will be repeated for viewing each video:

- The moderator will give participants time to view the video in its entirety and complete the transportation scale. The moderator will gauge initial reactions on note sheet prior to starting discussion in addition to any observation of body language or non-verbal responses of study participants while viewing the video and podcase.
- The moderator will lead a discussion of each video and subsequent podcast. The questions below will be repeated for each video and podcast.

Question 1

What do you believe is the main message of this video/podcast?

Probes

- What is the key takeaway from the video/podcast?
- What stood out about this video/podcast?

Question 2

Can you relate to the person in the video/podcast?

Probes

- Could you identify with the person in the video/podcast?

Question 3

How does this story (video/podcast) make you feel?

Probes

- What feelings are you experiencing after watching/listening to the video/podcast?
- Tell me more about these feelings.

Question 4

Is there anything about the story (video/podcast) that is confusing, unclear, or hard to understand? If so, what?

Probes

- Tell me more about these feelings.

Question 5

Was there anything about the story (video/podcast) that you liked? If so, what was effective (more specifically about the voice, the music, the graphics, etc.) about the story?

Probes

- Were there any aspects of the video/podcast that you enjoyed?
- Tell me more about these feelings.

Question 6

Was there anything about the story (video) that you disliked? If so, what was effective (more specifically about the voice, the music, the graphics, etc.) about the story?

Probes

- Were there any aspects of the video/podcast that you did not enjoy?
- Tell me more about these feelings.

Question 7

Does this story (video/podcast) make you (personally) want to take any action?

Probes

- Tell me more about why or why not.

Question 8

Does the story (video) make you want to encourage someone you know to take any action?

Probes

- Tell me more about why or why not.

Question 9

How do you feel about discussing breast cancer with your sorority sisters within this focus group setting?

Probes

- Tell me more about these feelings.

Immediately following the viewing/listening of the videos/podcast, participants viewed 3 infographics from the Bring Your Brave campaign. The following questions were used to guide the discussion to ascertain their overall sentiments about the infographics.

Here are a few infographics from the Bring Your Brave campaign. These infographics are used to help educate young women about breast cancer risks. Take a few minutes to review the infographics. While reviewing, keep in mind any feedback that you would like to discuss about the infographics, pictures, information, colors, placement, etc.

1. What are your first impressions about the infographics?
2. Were there any aspects of the infographics that you enjoyed? Did not enjoy?
3. What feedback would you provide to the campaign developers to make campaign infographics appealing to college women?

Thank you all so much for your time. I really appreciate your participation. Before we conclude, is there anything you would like to add from our discussion today. Again, thank you for your participation. I will send your Amazon gift card via email. Have a great day!

[end recording]

APPENDIX G
INFORMED CONSENT

**UNIVERSITY OF GEORGIA
CONSENT FORM**

**Harnessing the Power of Storytelling in Online Public Health Campaigns: An Evaluation of the
Bring Your Brave Campaign**

Principal Investigator: Dr. Jori Hall
College of Education
jorihall@uga.edu

Co-Principal Investigator: Monique Young
College of Education
mpy13655@uga.edu

You are being asked to take part in a research study. The information in this form will help you decide if you want to be in the study. Please ask the researcher(s) below if there is anything that is not clear or if you need more information.

We are doing this research study to learn more about college-age women perceive their breast cancer risk. This study is being conducted as part of a dissertation in the College of Education. You are invited to participate because you are a college-aged female who attends the University of Georgia.

You will be asked to complete a 10-minute pre-assessment survey, engage in a 45-60 minute focus group discussion after viewing videos related to breast cancer risk factors and prevention and a 5 minute post-assessment survey. If you do not want to answer any of the questions during the survey or the focus group, you may choose not to do so. Your participation in this research study will be one time only.

Participation is voluntary. You can refuse to take part or stop at any time without penalty. Your decision to participate will have no impact in your sorority membership.

There are no known risks to you for your participation in the surveys and focus group interviews except for your time spent on the survey/interview. There may be no benefit to you for your participation in this research. The information that you provide will allow us to better understand how college women perceive their breast cancer risk.

To thank you for your time, you will be compensated with a \$15 Amazon gift card.

We will take steps to protect your privacy, but there is a small risk that your information could be accidentally disclosed to people not connected to the research. To reduce this risk, all information that you provide will be kept confidential. Your name or other identifying information will not be linked to your survey. You will not be identified in any report or publication of this study or its results. We will keep any records that we produce private to the extent we are required to do so by law.

Please feel free to ask questions about this research at any time. You can contact the Co-Principal Investigator, Monique Young at 404-226-8265 or mpy13655@uga.edu. If you have any complaints or questions about your rights as a research volunteer, contact the IRB at 706-542-3199 or by email at IRB@uga.edu.

If you agree to participate in this research study, please sign below:

_____	_____	_____
Name of Researcher	Signature	Date
_____	_____	_____
Name of Participant	Signature	Date

Please keep one copy and return the signed copy to the researcher.

APPENDIX H

BRING YOUR BRAVE INFOGRAPHICS



BRING YOUR brave.

Take Action to Lower Your Breast and Ovarian Cancer Risk

Knowing your cancer risk and being proactive about your health may help you take steps to lower your risk for getting breast or ovarian cancer, or find it at an early stage. One in 40 Ashkenazi Jewish women has a BRCA gene mutation, compared to one in 500 women in the general population, putting them at an increased risk for breast cancer at a young age.

Learn Your Family History of Cancer



The next time you talk to your family about their medical history, be prepared with these tips. Follow these tips:

1. Share that you have learned that cancers can run in families.
2. Explain that you are creating a record of your family's history of cancer.
3. Encourage family members to respond in a way that is most comfortable to them.
4. Word your questions carefully, be a good listener, and respect their privacy.
5. Write down who had cancer, age when diagnosed, and type of cancer.

Understand Genetic Counseling and Testing

Genetic counseling and testing are recommended for women whose family medical history has certain patterns of cancer.

What is Genetic Counseling?

Genetic counseling can help you understand your risk based on your personal and family medical history.

You will discuss things like:

- If a genetic test is right for you.
- Specific tests that might be used and their accuracy.
- Possible genetic test results and next steps.
- How a test result might not give you all the information you need.
- The emotional risks and benefits of genetic testing.
- How genetic test results may affect other family members.



DID YOU KNOW?

Inherited mutations are thought to play a role in 5-10% of breast and 10-15% of ovarian cancers.

What is Genetic Testing?

Genetic testing helps you learn if your family history of breast cancer is due to a specific inherited gene mutation. It's done with a blood or saliva sample, at a doctor's office, hospital, or clinic.



Genetic test results are a factor in determining overall risk.

Results can help you understand your risk of getting breast and ovarian cancers and steps you can take to reduce your risk.

A positive test result does not mean you will definitely get breast or ovarian cancer. If you test negative for a specific gene mutation, you still may be at an increased risk for breast or ovarian cancer.



BRING YOUR brave.

Take Action to Lower Your Breast and Ovarian Cancer Risk

Knowing your cancer risk and being proactive about your health may help you take steps to lower your risk for getting breast or ovarian cancer, or find it at an early stage. African American women under the age of 35 have breast cancer rates that are two times higher than White women of the same age.

Learn Your Family History of Cancer



Asking relatives about their cancer histories can be hard. Follow these tips:

1. Share that you have learned that cancers can run in families.
2. Explain that you are creating a record of your family's history of cancer.
3. Encourage family members to respond in a way that is most comfortable to them.
4. Word your questions carefully, be a good listener, and respect their privacy.
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Genetic test results are a factor in determining overall risk.

Results can help you understand your risk of getting breast and ovarian cancers and steps you can take to reduce your risk.

A positive test result does not mean you will definitely get breast or ovarian cancer. If you test negative for a specific gene mutation, you still may be at an increased risk for breast or ovarian cancer.



Make Healthy Lifestyle Choices



Maintain a healthy weight



Get enough physical activity



Breastfeed your babies

Increase the chance of finding breast cancer early, when it's easier to treat.

- Know how your breasts normally look and feel.
- Talk to your doctor right away if you notice changes in your breast.
- Talk to your doctor if you have a higher risk, including a family history of cancer.

www.cdc.gov/BringYourBrave
#BringYourBrave



Make Healthy Lifestyle Choices



Maintain a healthy weight



Get enough physical activity



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www.cdc.gov/BringYourBrave
#BringYourBrave



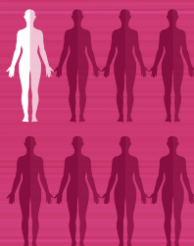


What Every Young Woman Needs to Know About Hereditary Breast & Ovarian Cancer



1 IN 8

women will be diagnosed with breast cancer during her life.



11% OF WOMEN

DIAGNOSED WITH BREAST CANCER IN THE US ARE YOUNGER THAN 45 YEARS OLD.