



Comparing narrative and informational videos to increase mammography in low-income African American women

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ABSTRACT

Objective: Compare effects of narrative and informational videos on use of mammography, cancer-related beliefs, recall of core content and a range of reactions to the videos.

Method: African American women ($n = 489$) ages 40 and older were recruited from low-income neighborhoods in St. Louis, MO and randomly assigned to watch a narrative video comprised of stories from African American breast cancer survivors (*Living Proof*) or a content-equivalent informational video using a more expository and didactic approach (*Facts for Life*). Effects were measured immediately post-exposure and at 3- and 6-month follow-up.

Results: The narrative video was better liked, enhanced recall, reduced counterarguing, increased breast cancer discussions with family members and was perceived as more novel. Women who watched the narrative video also reported fewer barriers to mammography, more confidence that mammograms work, and were more likely to perceive cancer as an important problem affecting African Americans. Use of mammography at 6-month follow-up did not differ for the narrative vs. informational groups overall (49% vs. 40%, $p = .20$), but did among women with less than a high school education (65% vs. 32%, $p < .01$), and trended in the same direction for those who had no close friends or family with breast cancer (49% vs. 31%, $p = .06$) and those who were less trusting of traditional cancer information sources (48% vs. 30%, $p = .06$).

Conclusions: Narrative forms of communication may increase the effectiveness of interventions to reduce cancer health disparities.

Practice implications: Narratives appear to have particular value in certain population sub-groups; identifying these groups and matching them to specific communication approaches may increase effectiveness.

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1. Introduction

Narrative forms of communication may have unique capabilities to help reach cancer control objectives and could be particularly effective in population sub-groups that bear a disproportionate burden of cancer [1–5]. However, few studies

to date have examined behavioral effects of narrative cancer communication interventions and fewer still have studied narrative effects in longitudinal studies or among disparity populations. This paper reports findings from a randomized trial comparing effects of content-equivalent narrative and informational breast cancer videos on use of mammography in a community sample of very low-income African American women.

Traditionally, health communication has used didactic and expository approaches that present information in the form of arguments or reasons designed to convince audiences to take some desired action. In contrast, narrative forms of communication use stories designed to engage audiences and demonstrate or model a desired action. In 2007, a National Cancer Institute (NCI) Working

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Group on Narrative Communication in Cancer Prevention and Control defined narrative as “a representation 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 being addressed” [3]. This definition captures a range of narrative types from dramas and storytelling to journalism, case histories and testimonials. The Working Group also proposed four distinctive capabilities of narrative and specified how each might apply to cancer prevention, screening, diagnosis, treatment and survivorship. In the case of cancer screening like mammography, narrative communication was hypothesized to: (1) help overcome resistance to screening and messages about screening; and (2) facilitate processing of information about cancer and screening.

Narratives can help overcome resistance in at least three interrelated ways. When audiences are engaged or absorbed in a narrative, they are less likely to generate thoughts and ideas rejecting its message (i.e., counterarguing) [6]. Narratives also facilitate identification with characters [7], which increases both audience engagement and positive thoughts about a story [8]. Finally, narratives that present real life experiences are harder to discount [7]. In the case of mammography, resistance might be reflected by behavior (i.e., avoiding mammograms), beliefs about cancer (e.g., cancer fatalism [9]), perceptions about the effectiveness of mammograms (i.e., test efficacy [10]) or confidence in one's ability to get a mammogram (i.e., self efficacy [11]). Resistance to messages about mammography might be expressed as counterarguing against these appeals or discounting them because of their source (e.g., medical mistrust [12]).

Narratives can facilitate information processing by capturing attention, enhancing understanding and aiding recall. Because storytelling is the primary way humans share social information and social experiences, processing narratives is familiar and comfortable. Most can do it from early childhood without special knowledge, training or skills. Social information stored in memory in narrative form is known to aid recall [13]. Narratives also generate greater emotional responses from audiences than didactic information [14]. Emotional arousal enhances memory, in part because emotional information is more likely to be processed with regard to oneself (i.e., self-referential thinking) [15]. Self-referential processing involves deeper, more elaborative cognition [16] and may enhance persuasion [17]. These advantages of narrative may be negligible for those accustomed to processing complex didactic information or those personally involved in the information topic, but could make a difference among those who are not [3,18]. Thus among women with lower levels of education and less personal involvement with breast cancer, narrative forms of communication might be more effective than other informational approaches.

This study compared effects of narrative and informational videos on use of mammography, cancer-related beliefs, recall of core content from the videos and a range of reactions to videos, including counterarguing. In addition, analyses tested selected propositions from the NCI Working Group on Narrative Communication in Cancer Prevention and Control that narratives help overcome resistance to mammography and messages about mammography, and that they may have particular benefits for certain population sub-groups.

2. Methods

The Institutional Review Boards at Saint Louis University and Washington University in St. Louis approved this study.

2.1. Study design

In a randomized trial, a community sample of African American women completed a baseline questionnaire, watched either a narrative or informational video, and completed an immediate

follow-up questionnaire while onboard a mobile research van in their neighborhood. Women were contacted by phone at 3 and 6 months post-baseline to complete a follow-up questionnaire.

2.2. Participants

Using neighborhood canvassing approaches, we recruited 489 African American women living in areas of St. Louis, MO where the rate of late stage breast cancer diagnosis was twice the expected rate for the state of Missouri. To be eligible, participants had to be African American women, ages 40 or older, never diagnosed with breast cancer, able to complete a brief literacy screener written at fifth grade level, have a working phone number and provide informed consent.

2.3. Protocol

Eligible women were invited onboard the *Neighborhood Voice* [19], a mobile health communication research facility that study team members drove to each recruiting location. Participants completed questionnaires on a 20" touch-screen monitor and watched the video on the same monitor in one of two private interview areas. Telephone follow-up interviews were administered at 3 and 6 months post-baseline. Women received a \$20 grocery store gift card for each phase of the study they completed (baseline, 3- and 6-month follow-up).

2.4. Videos

The study compared effects of two videos, *Living Proof* and *Facts for Life*. Both addressed 11 key messages about breast cancer risk (you can get breast cancer at any age; you could have breast cancer without knowing; you could be at risk even if you have no family history), talking about breast cancer (learn your family history; talk openly about breast cancer; share breast cancer experiences; women can survive breast cancer), and getting a mammogram (mammograms can find breast lumps before you can feel them; get a mammogram yearly or every 1–2 years; mammograms can be uncomfortable but are not really painful; mammograms can save lives by finding breast lumps early). *Living Proof* provided this information in the form of personal stories from African American breast cancer survivors. *Facts for Life* provided the information in didactic, expository form from an African American woman narrator. Both videos were the same length (22:41 and 22:37, respectively) and produced by the same commercial video production company.

2.4.1. Living proof

Using Wengraf's (2001) biographic narrative interview method [20], we elicited stories from 36 African American women who had been diagnosed with breast cancer and 13 family members of such women. Survivors ranged in age from 35 to 67, had been survivors for <1 to >23 years, and 91% were members of one of five different African American breast cancer survivor support groups in St. Louis, MO. Stories were captured on broadcast quality video, and segmented into 1624 discrete story units, of which 300 were tested in a preliminary study [8]. Results of that research informed the selection of 57 story units from 29 different survivors to be included in *Living Proof*. Excerpts from these stories were pieced together to tell a collective narrative organized around the three broad message topics—breast cancer risk, talking about breast cancer and getting a mammogram.

2.4.2. Facts for life

To assure content equivalence of the two videos, *Living Proof* was transcribed and became the basis for *Facts for Life*. In *Living*

Proof, survivor stories described personal experiences with breast cancer and mammography. In *Facts for Life*, these stories were translated into broader messages. For example, in *Living Proof* a survivor tells how she had an appointment to get a mammogram 6 months before her cancer was found, but felt fine and did not keep the appointment. Looking back, she thinks her cancer would have been found sooner if she had kept her appointment. Correspondingly, *Facts for Life* addresses the importance of making and keeping appointments, even if your breasts feel fine. Content in *Facts for Life* is delivered by an African American woman narrator, supplemented with a range of on-screen visuals (e.g., photos, video, graphics, charts, bulleted text) and background music.

The narrator was selected through a systematic audience research process. First, the study team reviewed demo tapes from 10 local African American professional actresses identified through two talent agencies. Based on similarity to the target audience, four were invited to an audition in which they were video recorded reading the *Facts for Life* script. Next, 12 women from the target audience (four each in age categories 40–49, 50–59, 60+) viewed each of the four audition tapes and completed quantitative ratings of similarity, liking, trust, expertise, physical appearance, voice quality, and camera presence (15 items). Participants also chose their favorite narrator from the four choices. To minimize the potential effects of viewing order, the sequence of the four videos was counterbalanced within each age strata. The actress receiving the highest overall score on quantitative ratings also received the most votes as favorite narrator, so was contracted to provide on-screen narration for *Facts for Life*.

2.5. Pilot study of video equivalence

To determine whether the two videos were equivalent in production quality and easy to understand, we conducted a randomized experiment among 150 low-income African American women from the target population. Women watched either *Living Proof* or *Facts for Life*, and within each, watched the section addressing either breast cancer risk, talking about breast cancer or getting a mammogram. Afterwards, women completed a 5-item measure of production quality that assessed the extent to which they felt the video looked professional, had clear pictures and good sound, lighting and color (SA–SD; $\alpha = .84$). They also completed a 3-item measure assessing whether the amount of information or the way it was presented made the video difficult to understand (SA–SD; $\alpha = .75$). Items were coded such that higher scores indicate greater production quality and ease of understanding. Participants had a mean age of 53.3 years, 61% reported an annual household income of $\leq \$10,000$, and 34.7% had fewer than 12 years of education. Mean scores for production quality (4.85 vs. 4.91, $p = .40$) and ease of understanding (4.28 vs. 4.18, $p = .52$) were not significantly different for the narrative and informational videos, respectively, nor did these scores differ for any of the three video topics (i.e., breast cancer risk, talking about breast cancer or getting a mammogram).

2.6. Measures

Baseline measures assessed constructs that could moderate effects of the videos (having family or friends with breast cancer, being advised by a doctor to get a mammogram, medical mistrust, trust in other sources of cancer information, ways of knowing, demographic characteristics) and pre-intervention status on selected study outcomes (mammography use, cancer fatalism, perceived community impact of cancer). Sources for each measure are cited unless the item(s) were created for the study; an asterisk indicates that the measure was administered at more than one time point (see Table 4).

Family or friends with breast cancer: Three yes/no items assessed whether participants have known *anyone*, a *close friend*, or a *family member* (mother, any sister, daughter) who has had breast cancer. For analyses, these items were combined into a single dichotomous variable (yes to *close friend* or *family member* vs. all other responses).

Physician recommendation to get a mammogram: A single item assessed whether women have ever been advised by a doctor or health care provider to have a mammogram (yes/no).

Medical mistrust: Five items from the Medical Mistrust Scale (MMS) [12] assessed participants' beliefs that doctors and health care providers: (1) hide information, (2) do not take medical complaints seriously, and (3) treat people from their ethnic group as "guinea pigs". Items also assessed beliefs that (4) people from different ethnic groups receive the same kind of care, and (5) people from their ethnic group cannot trust doctors and health care providers. These items use a 5-point response scale from strongly agree to strongly disagree (SA–SD) and had moderate internal consistency ($\alpha = .64$).

Trusting health information sources: Items from the 2005 Health Information National Trends Survey (HINTS) [21] were adapted to measure the extent to which participants would trust cancer information from six sources: a friend or neighbor, a family member, TV news, a health web site, a doctor, and a government agency (10-point scale, "not at all" to "very much"). Items are combined into a single index variable ($\alpha = .72$) to reflect the mean value of all responses.

Demographics: Participants provided their year of birth (age) and highest grade completed in school (education), and indicated pre-tax household income from a list of categories in \$5,000 increments.

Use of mammography: After providing a lay description of a mammogram, measures assessed whether women had ever had a mammogram (yes/no) and when they had their last mammogram (<1 year/1–2 years/ >2 years). In previous studies, test-retest reliability for these measures was adequate ($r_s = .72$, $p < .001$) [22,23]. In analyses, women who at baseline had never had a mammogram or whose last mammogram was more than 1 year ago were considered eligible for a mammogram during the study's 6-month follow-up period.

Cancer fatalism: Three items from Powe (1995) [24] assessed beliefs linking cancer to death ("If someone has cancer and gets treatment for it, they will probably still die from cancer"; "Cancer will kill you no matter when it is found and how it is treated"; "If someone has cancer, it's already too late to do anything about it"). These items had a 5-point response scale (SA–SD) and acceptable internal consistency ($\alpha = .72$) in the study sample.

Perceived community impact of cancer*: In three sequential questions, participants were asked which is the *most* important, *next most* important and *third most* important health problem affecting African American women in St. Louis. Choices included HIV/AIDS, sexually transmitted disease, high blood pressure, heart disease, stroke, violence, cancer and diabetes. Responses were combined into a single variable indicating whether cancer was identified in any of the three items (yes/no).

Follow-up measures assessed women's reactions to the video (liking, perceiving it as novel, learning new information from it, counterarguing against it, talking to family members and friends about it), unprompted recall of video content, cancer-related beliefs (perceived barriers, risk, social norms, behavioral intention, test efficacy, cancer fear, cancer fatalism, perceived community impact of cancer), and use of mammography.

Liking*: A single item measured how much participants liked or disliked the video (10-point scale, "didn't like it at all" to "liked it very much").

Novelty*: Two reverse-scored items ("The video was a lot like other health videos I've seen before"; "This is the kind of video that

usually plays in a clinic or doctor's office waiting room") assessed the extent to which women perceived the videos to be novel (5-point scale, SA–SD).

Learning new information: A single reverse-coded item assessed how much, if any, new information women learned from the video (a lot/some/very little/none).

Counter-arguing: Participants indicated agreement (reverse coded) or disagreement with three statements about the content of the video ("Since watching the video, I've had a lot of thoughts in favor of/against things that were said in the video"; "The information in the video was different from what I personally believe"). Items used a 5-point response scale (SA–SD).

Talking to family and friends: Separate items asked whether participants had talked to any family member or friend about new information they learned watching the video (yes/no).

Unprompted recall: At 3- and 6-month follow-up, women were asked what they remembered most about the video. Open-ended responses were recorded, transcribed and coded by trained research staff blinded to study condition. Coders rated each response for *topic* (mentioned "cancer," "breast," "breast cancer," "mammogram" or "mammography"), *content* (mentioned one of the 11 key messages in the video or risk of getting breast cancer or cancer, talking about breast cancer or cancer, getting a mammogram, breast exam or breast check) and *messenger* (mentioned the women talking in the video). Inter-coder reliability for these variables was high (Kappa = 0.98, 0.84 and 0.92, respectively). A composite measure was also created to summarize whether women's responses reflected any or none of these three variables.

Barriers to mammography*: Five items from Champion and Springston [25] assessed participants' beliefs that having a mammogram would be (1) painful and (2) take too much time; their fear of having a mammogram because (3) they might find out something is wrong and (4) they do not understand what would be done; and their belief that (5) people doing a mammogram are rude to women. Items used a 5-point scale (SA–SD) and had acceptable internal consistency ($\alpha = .72$).

Perceived risk*: A single item ("My chances of getting breast cancer are high"; 5-point scale, SA–SD) measured perceived risk.

Perceived social norms*: Two items ("Most African American women my age get mammograms"; "Most women whose opinion I value get regular mammograms") measured perceived social norms about mammography use (SA–SD).

Intention to get a mammogram: Women were also asked if they intended to get a mammogram in the next 6 months (4-point scale; definitely yes—definitely no).

Test efficacy*: Four items from Champion and Springston [25] assessed the extent to which participants believed that mammograms were effective. Participants indicated their level of agreement (5-point scale, SA–SD) with statements that "Having a mammogram is the best way to find a very small lump/will decrease my chances of dying from breast cancer/will help me find breast lumps early" and "If I find a lump early through a mammogram, my treatment for breast cancer may not be as bad." Internal consistency for these items was low ($\alpha = .48$).

Cancer fear*: Items from Champion et al. [26] assessed participants' level of agreement (SA–SD) with three statements sharing a common stem: "Thinking about breast cancer scares me a lot/makes me feel worried/upsets me." Internal consistency for these items was acceptable ($\alpha = .74$).

2.7. Statistical analyses

The primary analytic goal was to determine whether use of mammography, cancer-related beliefs, recall of core content from the videos and reactions to the videos varied by study group. Secondary analyses explored the extent to which the narrative video might have advantages over the informational video in overcoming resistance to mammography and messages about mammography among certain sub-groups of participants (e.g., those with low education).

Data analysis was carried out in three steps. First, we compared participant characteristics by study group at baseline, using χ^2 and

Table 1
Baseline characteristics of participants by study group.

Characteristic	Percent or mean (SD) by group		P
	Narrative	Informational	
N	244	245	
Demographic			
Age in years (n=479)	60.5 (12.0)	61.7 (12.2)	0.29 ^c
Years of school completed (n=485)			
<12 years	30.5	31.8	0.81 ^d
12 years	35.4	36.8	
>12 years	34.2	31.4	
Household income (n=457)			
≤\$10,000	52.4	58.3	0.42 ^d
\$10,001–\$20,000	23.1	19.3	
≥\$20,001	24.5	22.4	
Cancer-related beliefs			
Cancer fatalism ^a (n=488)	2.5 (1.1)	2.6 (1.1)	0.49 ^c
Medical mistrust ^a (n=488)	2.8 (0.9)	2.8 (0.9)	0.99 ^c
Trusting cancer information sources ^b (n=489)	6.3 (1.7)	6.1 (1.8)	0.35 ^c
Screening history and breast cancer experience			
Mammography status at baseline (n=487)			
Never had a mammogram	11.1	11.4	0.76 ^d
Last mammogram >2 years ago	12.3	15.5	
Last mammogram 1–2 years ago	21.3	20.8	
Up-to-date	55.3	52.2	
Ever advised by a doctor to get a mammogram (n=486)	86.4	87.3	0.76 ^d
Has had a close friend or family member with breast cancer (n=488)	58.9	52.2	0.14 ^d

^a Ranges from strongly disagree (1) to strongly agree (5).

^b Ranges from not at all (1) to very much (10).

^c Student t-test.

^d Pearson's chi-square test.

Fisher's exact tests for categorical variables and *t*-tests or Wilcoxon–Mann–Whitney tests (when not normally distributed) for continuous variables. We assessed attrition bias by comparing participants who did and did not complete the study, by study group, on these same variables. Second, we compared reactions to the two videos, beliefs about breast cancer and mammograms, and recall of video content at follow-up. For outcomes that were repeated measures at immediate, 3- and/or 6-month follow-up, we used mixed repeated measures analysis ('*proc mixed*' in SAS) to examine change over time within each study group at each follow-up period. This approach was used because all the participants had the same measurement schedule and because it takes into consideration correlated data at different time-intervals.

Third, we compared rates of mammography use by study group by estimating relative risk with a log-binomial regression model using modified Poisson regression with robust error variance, since the outcome was a common event (incidence >10%) [27,28]. These analyses were carried out among all women needing a mammogram at baseline, and also stratified by potential moderating variables measured at baseline (mammography history, education, cancer fatalism, medical mistrust, trusting cancer information sources, having a family member or friend with breast cancer, being advised by a doctor to get a mammogram). When rates of

mammography differed by study group in stratified analyses, the model included the interactive terms to test for a study group \times moderator interaction.

All statistical analyses were conducted using SAS 9.1.2.

3. Results

3.1. Participant characteristics

Participants were 489 African American women with a mean age of 61.1 years; 31.1% had completed fewer than 12 years of school and 55.4% reported an annual household income of \$10,000 or less. These characteristics did not vary by study group (Table 1), nor did baseline values for cancer-related beliefs (cancer fatalism, medical mistrust) or behaviors (mammography history, physician advice to get a mammogram, having had family or friends with breast cancer). Attrition was low; 453 women (92.6%) completed either 3- or 6-month follow-up and 429 (87.7%) completed both. Compared to completers, non-completers had fewer years of education, lower income, less personal experience with breast cancer, and were less likely to have had a mammogram or been advised by a doctor to get a mammogram. These differences did not vary by study group.

Table 2

Reactions to videos and pre-behavioral outcomes measured immediately post-exposure and at 3- and 6-month follow-up, by study group.

Reactions to video (response scale)	Study group	Follow-up			<i>p</i> ^a
		Immediate	3-months	6-months	
Liked the video (1–10)	Narrative	9.5 (1.2)	9.5 (1.1)	9.4 (1.4)	0.76
	Informational	9.0 (1.9)	9.2 (1.4)	9.3 (1.5)	0.15
	<i>p</i> ^b	<.01	<.01	<.01	
Perceived video as novel (1–5)	Narrative	2.6 (1.2)	3.0 (1.3)	3.0 (1.3)	<.01
	Informational	2.4 (1.1)	2.6 (1.2)	2.6 (1.3)	0.13
	<i>p</i> ^b	<.05	<.01	<.01	
Talked to family about video (% yes)	Narrative		76.7		
	Informational		64.9		
	<i>p</i> ^b		<.01		
Talked to a friend about video (% yes)	Narrative		69.8		
	Informational		66.0		
	<i>p</i> ^b		0.42		
Learned new info from video (1–4)	Narrative		3.3 (0.8)		
	Informational		3.3 (0.9)		
	<i>p</i> ^b		0.34		
Counter-argued against video (1–5)	Narrative		2.0 (0.9)		
	Informational		2.3 (0.9)		
	<i>p</i> ^b		<.01		
Perceived community impact of cancer (% ranking in top 3 health issues)	Narrative	49.2 ^c	58.2	64.7	<.01
	Informational	49.0 ^c	59.9	54.9	0.11
	<i>p</i> ^b	0.96	0.72	<.05	
Cancer fear (1–5)	Narrative	3.0 (1.2)	3.1 (1.3)	3.0 (1.3)	0.29
	Informational	2.8 (1.2)	2.9 (1.3)	2.9 (1.2)	0.24
	<i>p</i> ^b	<.05	0.08	0.78	
Number of barriers to mammography	Narrative	1.7 (0.8)	1.5 (0.7)	1.5 (0.6)	<.05
	Informational	1.9 (0.9)	1.7 (0.8)	1.7 (0.7)	<.05
	<i>p</i> ^b	<.01	<.01	<.05	
Test efficacy for mammography (1–5)	Narrative	4.5 (0.6)	4.4 (0.6)	4.5 (0.6)	0.18
	Informational	4.4 (0.7)	4.3 (0.8)	4.3 (0.7)	0.10
	<i>p</i> ^b	0.29	0.40	<.01	
Perceived social norms (1–5)	Narrative	4.1 (0.8)	4.1 (0.9)	4.1 (1.0)	0.73
	Informational	4.0 (0.9)	3.9 (1.1)	3.9 (1.1)	0.68
	<i>p</i> ^b	0.29	0.21	0.29	
Perceived breast cancer risk (1–5)	Narrative	2.9 (1.3)	2.8 (1.6)	2.7 (1.5)	0.25
	Informational	3.0 (1.3)	2.7 (1.5)	2.7 (1.6)	0.06
	<i>p</i> ^b	0.51	0.72	0.84	
Intention to get a mammogram (1–5)	Narrative	3.6 (0.7)			
	Informational	3.4 (0.9)			
	<i>p</i> ^b	<.01			

^a Trend within group using Jonckheere–Terpstra (JT) trend test; Wilcoxon signed rank sum test.

^b Between groups percentages compared using Pearson's chi-square test; mean (SD) compared using Wilcoxon–Mann–Whitney test.

^c Pre-intervention baseline value, not measured at immediate follow-up.

Table 3

Unprompted recall of video at 3- and 6-month follow-up, by study group.

Response at 3- or 6-month follow-up	What do you remember most about the video? (%)		<i>P</i> ^a
	Narrative	Informational	
Any valid response, 3 months (<i>n</i> =449)	71.7	60.1	<.01
Any valid response, 6 months (<i>n</i> =433)	70.3	58.4	<.01
<i>P</i> for 3- vs. 6-month follow-up within group ^b	0.70	0.74	
Specific mention of breast cancer or mammography, 3 months (<i>n</i> =448)	62.8	59.9	0.53
Specific mention of breast cancer or mammography, 6 months (<i>n</i> =433)	71.7	64.5	0.11
<i>P</i> for 3- vs. 6-month follow-up within group ^b	<.05	0.18	
Specific mention of women in the video, 3 months (<i>n</i> =449)	54.0	21.1	<.01
Specific mention of women in the video, 6 months (<i>n</i> =433)	65.7	25.2	<.01
<i>P</i> for 3- vs. 6-month follow-up within group ^b	<.01	0.22	
Specific mention of any video topic or key message, 3 months (<i>n</i> =449)	27.9	28.7	0.85
Specific mention of any video topic or key message, 6 months (<i>n</i> =433)	22.4	18.7	0.34
<i>P</i> for 3- vs. 6-month follow-up within group ^b	0.09	<.01	

^a *P*-value using modified Poisson regression comparing the two groups at each time interval.^b *P*-value using modified Poisson regression comparing each group between time intervals.

3.2. Reactions to videos

Both videos were well liked by participants, but the narrative video received significantly higher scores for both liking and novelty at all three follow-up periods (see Table 2). In addition, ratings of novelty improved significantly over time for the narrative video ($p < .01$), but not for the informational video. At 3-month follow-up, women who watched the narrative video were more likely to report that they had talked to family members about the video (77% vs. 65%; $p < .01$) and had engaged in less counterarguing against information in the video (mean scores

2.0 vs. 2.3; $p < .01$). There were no group differences in how much new information women reported learning from the videos.

3.3. Cancer-related beliefs

Table 2 shows all findings for cancer-related beliefs. Immediately after watching the videos, women who saw the narrative video had higher cancer fear scores than those who saw the informational video (3.0 vs. 2.8; $p < .05$) and greater intention to get a mammogram in the next 6 months (3.6 vs. 3.4; $p < .01$). The group differences in cancer fear found immediately after

Table 4

Use of mammography at follow-up by baseline characteristics and study group.

Characteristic	Percent reporting use of mammography		<i>P</i>	<i>P</i> ^c
	Narrative	Informational		
<i>N</i> eligible for mammogram during study period	107	115		
All eligible women (<i>n</i> =222)	48.6	40.0	0.20	
Mammography status at baseline				
Never had a mammogram (<i>n</i> =55)	37.0	25.0	0.39	0.80
Last mammogram >2 years ago (<i>n</i> =66)	31.0	27.0	0.72	
Last mammogram 1–2 years ago (<i>n</i> =101)	64.7	58.0	0.49	
Age				
40–49 (<i>n</i> =55)	33.3	32.1	0.93	0.42
50–59 (<i>n</i> =72)	50.0	43.8	0.60	
60+ (<i>n</i> =92)	57.5	40.4	0.10	
Education				
<12 years (<i>n</i> =72)	64.5	31.7	<.01	<.05
≥12 years (<i>n</i> =148)	42.1	43.1	0.91	
Annual household income				
≤\$10,000 (<i>n</i> =125)	49.1	34.7	0.11	0.12
>\$10,000 (<i>n</i> =86)	44.9	51.4	0.55	
Cancer fatalism ^a				
<2.3 (<i>n</i> =113)	48.4	45.1	0.73	0.46
≥2.3 (<i>n</i> =108)	48.9	36.5	0.20	
Medical mistrust ^a				
<3 (<i>n</i> =104)	46.8	42.1	0.63	0.58
≥3 (<i>n</i> =118)	50.0	37.9	0.19	
Trusting cancer information sources ^b				
<6.27 (<i>n</i> =111)	47.9	30.2	0.06	0.09
≥6.27 (<i>n</i> =111)	49.2	51.9	0.77	
Ever advised by a doctor to get a mammogram?				
Yes (<i>n</i> =175)	55.2	45.5	0.20	0.57
No (<i>n</i> =46)	20.0	23.1	1.0	
Had a close friend or family member with breast cancer?				
Yes (<i>n</i> =118)	48.4	50.0	0.86	0.11
No (<i>n</i> =104)	48.9	30.5	0.06	

^a Ranges from strongly disagree (1) to strongly agree (5).^b Ranges from not at all (1) to very much (10).^c Using modified Poisson regression approach, *P*-value of the interaction.

watching the video were not sustained at 3- or 6-month follow-up.

At every follow-up period, women who watched the narrative video reported significantly fewer barriers to mammography than those who watched the informational video. Beliefs that mammograms were effective (i.e., test efficacy) were similar between study groups at immediate and 3-month follow-up, but higher at 6-month follow-up among women who watched the narrative vs. informational video (4.5 vs. 4.3; $p < .01$). The study groups did not differ at any follow-up period or over time on perceived risk or perceived social norms for getting mammograms.

Perceived community impact of cancer was measured at baseline and again at 3- and 6-month follow-up. The proportion of women ranking cancer as one of the top three health problems among African Americans women in St. Louis did not differ by study group at baseline or 3-month follow-up, but at 6-month follow-up the proportion was higher among women who watched the narrative video (65% vs. 55%, $p < .05$). In addition, the proportion of women ranking cancer in the top three increased significantly from baseline to 6-month follow-up among those watching the narrative video ($c^2 = 14.2$; $p < .01$), but not the informational video.

3.4. Unprompted recall of video content

Women were more likely to recall information from the video when they watched the narrative vs. informational version (see Table 3). Overall, the proportion of women who recalled anything about the content, topics or messengers in the videos was greater for the narrative than informational group at both 3-month follow-up (72% vs. 60%; $p < .01$) and 6-month follow-up (70% vs. 58%; $p < .01$). In particular, at both 3- and 6-month follow-up, those who watched the narrative video were much more likely than those watching the informational video to recall something about the women in the video (i.e., the messengers). Additionally, between 3- and 6-month follow-up, participants' specific mention of women in the video increased significantly among women who watched the narrative video, but not among those who watched the informational video. From 3- to 6-month follow-up, participants' specific mention of breast cancer or mammography in unprompted recall increased significantly among women who watched the narrative video (from 63% to 72%; $p < .05$), but not among those who watched the informational video. Conversely, recall of any of the video's 11 core messages declined significantly from 3- to 6-month follow-up among women who watched the informational video (from 29% to 19%; $p < .01$), but not among those who watched the narrative video.

3.5. Use of mammography

Among all women who were not up-to-date on mammograms at baseline and who completed one or both follow-up assessments ($n = 222$), 44% ($n = 98$) reported getting a mammogram at either 3- or 6-month follow-up. Although the rate of mammography use was higher for women watching the narrative vs. informational video (49% vs. 40%), the difference was not statistically significant.

In stratified analyses, the narrative video led to higher mammography rates than the informational video among women with less than 12 years of education (65% vs. 32%; $n = 72$, $p < .01$) and marginally higher rates among women who did not have a close friend or family who have had breast cancer (49% vs. 31%; $n = 104$, $p = .06$), who had lower levels of trust for traditional sources of cancer information (48% vs. 30%; $n = 72$, $p = .06$) and who were ages 60 and older (58% vs. 41%; $n = 92$, $p = .10$). Household income, cancer fatalism, medical mistrust and having ever been

advised by a doctor to get a mammogram were not associated with use of mammography at 6-month follow-up.

4. Discussion and conclusion

4.1. Conclusion

Compared to a content-equivalent and similarly race-targeted informational video, a narrative video made up of excerpts from stories told by African American breast cancer survivors was better liked and more remembered, and women who watched it reported fewer barriers and greater intention to getting a mammogram. These advantages of the narrative video did not translate into higher mammography rates among all women who needed one, although the narrative video did lead to greater use of mammography than the informational video among women with less than a high school education, those who did not have a close friend or family member who has had breast cancer, and those who reported less trust for other sources of cancer information.

4.2. Discussion

The apparent benefits of narrative for these sub-groups of women are promising for eliminating breast cancer disparities. Myriad studies have shown that racial and ethnic minorities and those with lower levels of education are less likely to be up-to-date with mammography [29,30]. In the current study, 20% of women with fewer than 12 years of education had never had a mammogram at baseline compared to only 7% of women with 12 or more years of education ($c^2 = 17.4$; $n = 488$, $p < .01$). Similarly, women who did not have a close friend or family member with breast cancer were more likely than those who did to report at baseline never having had a mammogram (18% vs. 6%; $c^2 = 19.2$; $n = 488$, $p < .01$).

Where differences were found between the effects of the narrative and informational videos on use of mammography, it was not always because narratives outperformed expectations but rather that the informational video performed so poorly. One interpretation of these findings is that informational approaches may be especially *ineffective* for certain population sub-groups (e.g., those with less education, less personal experience with breast cancer and those who tend not to trust health information). The relative absence of these groups from study samples in previous research comparing narrative and informational approaches could help explain the generally equivocal and sometimes inconsistent findings in these studies [31].

At least one of these sub-group effects, the difference between narrative and informational videos among women who have not had a close friend or family member with breast cancer, reinforces findings from prior research. Braverman [18] found that women with less personal involvement with breast cancer were more persuaded by breast cancer information presented in the form of testimonials compared to an informational approach. Because those with less personal involvement in a topic are generally less motivated to scrutinize information about the topic, narrative approaches might be more effective because they engage audiences with stories and characters, not just topic-specific information. Evidence supporting this explanation can be seen in the high percentage (>65%) of women in the narrative group who, when asked what they remembered most about the video, mentioned the breast cancer survivors who appeared in it (Table 3). Similarly, the strong association between watching a narrative and identifying with its characters—reported by McQueen and Kreuter in this issue—seem to support this explanation [14].

The study compared narrative and informational videos in the specific context of reducing the burden of breast cancer in a sample

of low-income, urban-dwelling, African American women. The generalizability of findings beyond these parameters is unknown. When interpreting the findings, also remember that the interventions being tested inherently conflate communication style (narrative vs. informational) with communication source (breast cancer survivor vs. narrator). While it is certainly possible to design experimental research that controls for the contributions of each, we felt these conditions would be inauthentic (e.g., survivors delivering information in a purely expository style, women unaffected by breast cancer telling personal stories about it), and thus did not include them.

With only a 6-month follow-up period in the study, it is possible that we missed some video-inspired mammograms that occurred after the conclusion of the study. However, the intervention being tested was a one-shot, 22-min video—it was not part of a broader, comprehensive intervention, nor was it integrated within clinical systems that provide screening. Thus, we felt that if it was able to influence use of mammography among women who needed to be screened, we should be able to measure those effects in a relatively short time period. The proportion of women who needed a mammogram at baseline was lower than we expected. While this is good news for population-level cancer control, it reduced the study's power to detect group differences in use of mammography. A final potential limitation of the study is its use of a self-reported behavioral outcome. However, a range of studies – including those with samples of African American and low income women – show that self reports of mammography are generally accurate [32–34]. Although only 31–40% of women correctly identify the exact month and year of their last mammogram, over 80% are accurate within a 12-month margin of error [33,34].

Because narratives can vary on many dimensions and be applied for countless purposes in health communication, these details are important in interpreting findings. In this study, the narratives tested were true (not fictional), about lived experiences (not generalized); told in first person by the survivor (not third person), shown on video (not print) and designed to promote screening (not influence medical decision making). Research suggests first-person narratives are more likely than third-person narratives to achieve effects [35], and visual media like videos tend to make characteristics of the source (i.e., survivors, in this study) more salient [36]. Both factual and fictional narratives have been found to influence behavior in different studies, and identifying a story as one or the other does not seem to affect audience engagement in the story [6]. Although the goal of narratives in this study was to promote an evidence-based and nationally recommended cancer screening behavior, we and others have expressed concerns that powerful stories showing atypical results could lead viewers to make medical decisions that ignore strong evidence [3,37]. However, a recent review found only equivocal evidence to support this unintended consequence of using narratives [35].

Findings from the study raise important questions to be explored in future research. Foremost among them is the need to examine potential causal pathways between the immediate and intermediate effects of narrative, and its longer-term impact on behavioral outcomes. For example, the McQueen study in this issue describes a range of immediate effects of exposure to the narrative video, including strong emotions, a high level of engagement, and identification with those who appear in the video [14]. In the present study, the same narrative video was found to increase intentions to be screened and talking to family members about breast cancer, reduce perceived barriers to screening and counter-arguing against breast cancer information, and in some sub-groups of women appeared to increase use of mammography. While these outcomes are interrelated in various theories of communication, persuasion and behavior change, a causal sequence describing their chain of influence has not been established for narrative

communication, nor have studies examined how the importance or ordering of different factors might vary by audience characteristics.

4.3. Practice implications

Because there were no study outcomes or participant sub-groups for which the informational video outperformed the narrative video, an argument might be made for using a narrative approach when communicating breast cancer information to all low-income African American women. This would be defensible if narrative and informational videos were the only available options and did not differ in production time or costs. But neither of those conditions is true. It is more likely the case that for many women, even in a low-income minority population, only minimal (if any) intervention is needed to stimulate continued adherence to mammography guidelines. For these women, the advantages of narrative may be negligible. But in other sub-groups of women, such as those not as inclined towards breast cancer screening, narratives appear to have benefits beyond those that can be generated by purely informational approaches. Identifying these sub-groups of women and providing them with compelling stories from similar and credible peers may help increase screening and reduce breast cancer disparities.

Beyond the specific case of mammography in low-income minority women, these findings support a more general proposition that narratives may be especially useful in overcoming resistance to health information or health-related behaviors [3]. Thus other applications of narrative might focus on individuals and groups that would benefit from changing some health behavior but have been resistant to trying (e.g., due to low self efficacy or doubts about response efficacy) or even resistant to information about it (e.g., avoiding or ignoring other types of messages). In clinical settings, narratives might be used to support behavioral recommendations made by health care providers. For example, providers might give patients stories from similar others who have tried to make the same recommended changes. Linking supplemental health information like stories to provider advice may actually increase the effectiveness of both [38].

Conflicts of interest

The authors are not aware of any conflicts of interest.

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