Real-time moment-to-moment emotional responses to narrative and informational breast cancer videos in African American women

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Abstract
In a randomized experiment using moment-to-moment audience analysis methods, we compared women’s emotional responses with a narrative versus informational breast cancer video. Both videos communicated three key messages about breast cancer: (i) understand your breast cancer risk, (ii) talk openly about breast cancer and (iii) get regular mammograms. A community-based convenience sample of African American women (n = 59) used a hand-held audience response device to report the intensity of their emotional reaction while watching one of the two videos. Strong emotions were more likely to correspond to contextual information about characters in the video and less likely to correspond to health content among women who watched the narrative video compared with those who watched the informational video (P < 0.05). Women who watched the narrative video were more likely to report feeling attentive (41 versus 28%, respectively), inspired (54 versus 34%) and proud (30 versus 18%) and less likely to feel upset (8 versus 16%) (all \(P < 0.05\)). Women in the narrative group were more likely to mention women’s personal stories than health information in open-ended recall questions, but this did not detract from obtaining health information. Findings suggest that stories can be used to communicate health information without distracting from core health content.

Introduction
Narrative interventions as strategies for improving health behavior have been explored extensively in public health, nursing, and medical research [1–3]. Recent studies have suggested the potential of survivor stories and narrative forms of communication as effective tools to help eliminate cancer disparities [4–7]. A common finding across these studies is that stories elicit greater emotional response from audiences than do other forms of communication.

Emotions can influence what people notice and remember [8, 9]. Events and experiences that provoke joy, fear or sadness tend to be more prominent memories in the array of human experience. Emotions also affect reason, beliefs and behaviors [8, 10]. In the realm of health communication, messages that evoke greater emotion are better remembered and perceived as more effective than those that evoke less emotion [11–13]. Perhaps more importantly, experiencing specific emotions may influence problem-solving responses and information processing in audiences exposed to a message. Under different conditions, these ‘action tendencies’ of emotions may enhance or inhibit reactions to and persuasiveness of health messages or have no effect on them at all [14].

In previous intervention studies designed to help address breast cancer disparities, we have compared the effects of two breast cancer videos on African American women’s beliefs about screening and use of mammography [5, 15–17]. One video uses
African American breast cancer survivors’ stories told in personal narratives and the other video uses a more traditional informational approach. Heightened emotional response was found among women who watched the narrative video. The focus on African American women reflects a broader goal of conducting research that could be applied to help eliminate breast cancer disparities. African American women suffer a disproportionate burden of breast cancer mortality, and focusing on solutions to this problem is central to our research. The current experiment sought to elucidate specific causes and effects of these emotional reactions. Two questions guided the study:

Research Question #1: What parts of the narrative and informational videos elicited the strongest emotional responses, what types of emotions were experienced and what video content was being delivered at those moments?

Research Question #2: How are emotional responses to the videos associated with recall of 11 specific breast cancer messages contained within the videos?

Methods

This study was approved by the Institutional Review Board at Washington University in St Louis.

Participants
A convenience sample of 59 African American women ages 40 and older was recruited from a database of community research volunteers and word of mouth. Women with a previous diagnosis of breast cancer were not eligible. Participants received a $25 grocery store gift card as compensation for their time and transportation assistance when needed.

Study design
In a randomized experiment, women completed a baseline assessment and were assigned to watch one of two breast cancer videos while using a handheld audience response device to record the intensity of their emotions in real time. Twenty-nine participants watched the narrative video and 30 participants watched the informational video. After watching the video, women completed a three-part follow-up. First, they completed a follow-up assessment, which asked questions about their general reactions to the video. Second, using the moment-to-moment audience response data, we identified the five moments of greatest emotional response for each participant and had her view these parts of the video again. After watching each excerpt, participants were asked to indicate which specific emotions, from a list of 20, they experienced during this part of the video [18]. Third, participants were asked open-ended recall questions about the content of the video.

Videos
Both videos addressed 11 key messages, which fit into three broad categories; these included, breast cancer risk (you can get breast cancer at any age, you could have breast cancer without knowing and 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 and 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 and mammograms can save lives by finding breast lumps early). Both videos were 22-min long, produced by the same commercial video production company and previously evaluated in a longitudinal intervention study to increase use of mammography in African American women [5].

Living proof (narrative video)
Using Wengraf’s biographic narrative interview method [19], stories were elicited from 36 US born African American women who had been diagnosed with breast cancer. Survivors ranged in age from 35 to 67, lived in St Louis, MO, where the study took place, and had been survivors for <1 to >23 years. The Wengraf method uses a three-stage approach:
(i) asking women to share their story, uninterrupted, in whatever order and whatever level of detail they chose, taking as long as they wish; (ii) probing deeper on specific events or topics introduced of her narrative and (iii) asking her to share her story about other breast cancer topics if they were not already addressed in her narrative. Their stories were wide ranging, but three themes related to breast cancer screening emerged—breast cancer risk, importance of talking openly about breast cancer and the importance of regular mammography—and thus were featured in the video. Of the 1624 discrete story units recorded on broadcast quality video, 57 story units from 29 different survivors were chosen to be included in ‘Living Proof’ [15]. Excerpts from these stories were pieced together to tell a collective narrative organized around the three breast cancer screening message topics.

Facts for life (informational video)
To assure content equivalence of the two videos, the stories that comprised the Living Proof video were transcribed and formed the basis for ‘Facts for Life’. All topics and key messages from the survivors’ stories were therefore addressed in the informational video, often using the same language but not in the form of stories and not delivered by a breast cancer survivor. An African American woman narrator, who is a professional actor chosen through a systematic audience research process, delivered content in Facts for Life. The narration was supplemented with a range of on-screen visuals (e.g., images, video, graphics, charts, bulleted text) and background music.

Pilot study of video equivalence
In a randomized experiment, the two videos were compared on a five-item measure of production quality assessing the extent to which the video looked professional, had clear pictures and good sound, lighting and color (strongly agree [SA]–strongly disagree [SD]; α = 0.84) and a three-item measure assessing the extent to which the amount and presentation of information made the videos easy to understand (SA–SD; α = 0.75). Mean scores on a five-point scale for production quality (4.85 versus 4.91, P = 0.40) and ease of understanding (4.28 versus 4.18, P = 0.52) were not significantly different for the narrative and informational videos, respectively. These scores also did not differ for any of the three topics embedded within each of the two videos (i.e., breast cancer risk, talking about breast cancer or getting a mammogram).

Measures
Audience response devices by Perception Analyzer® [20] were used to measure intensity of emotions experienced during the individual viewing sessions. These hand-held devices have a dial and a digital screen that displays numbers from 0 to 100 that correspond to the position of the dial (i.e., 0 = dial turned fully left and 100 = dial turned fully right). The device is wirelessly linked to a laptop computer using radio frequency. The accompanying software records the value shown on the dial every second, which is synchronized to the video. These devices are routinely used during political debates and in marketing research [20].

Participants from both groups were taught how to use the perception analyzer and completed two practice sessions with the same non-health-related stimuli (excerpts from a political speech and a movie) before using the device in the study. Participants were instructed to turn the dial higher (i.e., toward 100) when they experienced strong emotions and lower (i.e., toward zero) when they experienced little emotion. After viewing of the video concluded, the moment-to-moment audience response data were used to identify the five points of highest emotional response for each participant. Participants then viewed again the five parts of the video that corresponded to these peak emotions and were asked to indicate which specific emotions they experienced at each point from a list of 20 items based on the Positive and Negative Affect Scale (upset, frustrated, guilty, hopeful, interested, attentive, scared, energetic, excited, ashamed, angry, sad, worried, inspired, enthusiastic, determined, happy, nervous, proud and afraid) [18, 21].

To link participants’ emotional peaks to specific video content, each of the videos was coded for the
11 key breast cancer prevention messages. Both videos contain periods when these messages are being actively discussed and other periods when they are not. Coding was done in 30-s intervals and each 30-s bin was coded dichotomously (i.e., key message being addressed versus not).

Results

Participants
The ages of participants ranged from 40 to 82 years with a mean age of 61. The majority had completed high school and had at least some college education. When asked about their mammography status, most participants reported having a mammogram within the last 2 years. The two groups were not significantly different on these demographic and screening variables but did differ in household income, with proportionally more women in the Facts for Life group reporting income of less than $20 000 per year. Cancer fear, cancer fatalism and perceived risk of getting breast cancer were measured at baseline. Across both groups, the study sample had relatively low rates of all three and there were no significant differences by group (cancer fear — mean = 2.7 on 1–5 scale where 5 = most fearful; cancer fatalism — mean = 1.8 on 1–5 scale where 5 = most fatalistic; perceived breast cancer risk — mean = 2.5 on 1–5 scale where 5 = greatest perceived risk).

Emotional reactions and video content
Fisher’s exact test revealed a significant difference between the two videos in the type of information that elicited strong emotions. For those watching the informational ‘Facts for Life video, 75% of emotional peaks occurred during periods when the video was presenting key messages about breast cancer while 25% occurred during non-message content. For women watching the narrative Living Proof video, fewer peaks occurred during key messages about breast cancer (63%) and more during non-message content (37%), as seen in Fig. 1. This difference was statistically significant ($P < 0.05$).

Types of emotions experienced
Although many of the ‘types’ of emotions women experienced at emotional peaks were similar between the two groups, there were several significant differences. Using Wilcoxon-Mann-Whitney tests to evaluate differences between the groups, those who watched Living Proof were significantly more likely to feel attentive, inspired and proud during points of peak emotional response and less likely to feel upset compared with those who watched the ‘Facts for Life video (all $P < 0.05$) (Fig. 2). The two groups were equally likely to feel frustrated, guilty, hopeful, interested, scared, energetic, excited, ashamed, angry, sad, worried, enthusiastic, determined, happy, nervous and afraid.

Recall of core content
In open-ended recall questions, women were first asked, ‘What do you feel were the main points of the video?’ Women could provide multiple answers. The majority of participants in both groups (96% for Living Proof; 83% for Facts for Life) mentioned at least one of the 11 key messages from the three topic areas. These high levels of recalling any core content immediately post viewing were not statistically significant between groups. Nearly, all participants from both groups mentioned getting a mammogram as a main point of the video (83% for ‘Living Proof’ versus 77% for ‘Facts for Life), which is consistent with the high rate of screening in our sample. Comparatively
fewer women mentioned breast cancer risk (24 versus 27%) or talking about breast cancer (31 versus 23%) as main points.

Women were next asked, ‘What is the one thing you remembered most about the video?’ The research team coded all responses based on whether they mentioned the women and/or the narrator in the video (yes/no). Fisher’s exact test was used to evaluate differences. Fifty-nine percent of those who watched Living Proof specifically mentioned women in the video, while only 29% of those who watched Facts for Life mentioned women in the video or the narrator (P < 0.05).

Discussion

Study findings shed new light on the link between narratives and emotional reactions and refute the fear expressed by some that viewers might miss core health content when it is embedded in engaging narratives. The sources of emotion-inducing content and types of emotion elicited differed between the two videos. Women who watched the narrative video were more likely to experience their strongest emotions during parts of the video that presented contextual information about characters rather than during key health messages about breast cancer. Although this study was not designed to test the effects of specific ‘types’ of contextual information on emotional reactions, anecdotal evidence suggests some interesting hypotheses. For example, when we aggregated participant responses to the Living Proof video, we observed that several of the peak emotional responses corresponded to parts of the video in which breast cancer survivors were describing their faith or family. Previous research has shown that health information framed in the context of cultural values like these can help increase cancer prevention and screening behaviors [22]. Future research should explore such associations more purposefully.

Women who watched the Living Proof video were also more likely to report feeling attentive, inspired and proud and less likely to feel upset during peak emotional responses compared with those who watched Facts for Life. These reactions were also reflected in what women remembered most about the videos, with those watching the narrative version more likely to mention the characters in the video. Yet the greater emotion and attention paid to contextual information did not detract from women learning key breast cancer messages in the video, as the two groups did not differ in this regard.

The use of moment-to-moment audience response analysis allowed us to observe women’s reactions in real time and link these data to specific video content. Traditional methods that rely on post-exposure self-reports typically generate only generalized reactions to some stimuli in its entirety and cannot easily be linked to specific parts of the stimuli. The devices were easy for participants to use and may have particular advantages in low-literate samples, providing a means for participants to express their feelings and reactions in ways other than written or verbal language. But they also have limitations. Participants can only register one broad reaction at a time (i.e. emotion, liking, agreeing), and it’s not known how these reactions are correlated with objective (i.e. biological) indicators of emotional response.

Because the study used a small convenience sample drawn from a community-based registry and by word of mouth, generalizability of these findings may be limited. Additionally, a large majority of women in this sample reported having a mammogram within the last two years (89.7%...
of those who watched Living Proof and 93.3% of those who watched Facts for Life), which certainly limits our ability to project these findings to samples of women less adherent to mammography guidelines. Mammography status was not part of the eligibility criteria, and we did not have this info prior to enrollment. In hindsight, this study would have been strengthened if our entire sample needed mammograms. Participants shared several things in common with the survivors featured in the narrative video. Both groups of women were US born African Americans, lived in St Louis and had a similar distribution of age (although on average participants were younger than the survivors in the video). Both also volunteered for research participation, albeit in different roles (i.e. sharing stories versus viewing stories). The principle of ‘optimal heterophily’ (i.e. dissimilarity) suggests that the most credible messengers are those that are similar to an audience in all ways ‘except’ the subject matter being addressed, in which the messenger has some unique experience or expertise [23]. This would certainly be the case in this study, as the survivors in the narrative video were similar to participants in many ways, but differed from in their personal breast cancer experience.

An additional limitation of this study is that we were unable to follow these women longitudinally after viewing and, therefore, could not assess behavioral outcomes. However, we do know from previous studies that narrative indirectly increases knowledge retention through talking with family members, which may increase acceptance and motivation to act on health information [17].

Health communication developers rightfully focus great energy on assuring that health information content is current and accurate, but sometimes pay less attention to presenting the information in engaging formats. For practitioners, these findings suggest that emotionally evocative and context-rich personal stories can be used to communicate health information without distracting from or compromising audience attention to core health content. It may even be the case that these non-health dimensions of communication are as important and potent as the health content itself; future studies should explore this possibility.

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References


