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Short Communication

Process outcomes from a randomized controlled trial comparing tailored mammography interventions delivered via telephone vs. DVD

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ABSTRACT

Objective: Tailored, interactive mammography-promotion interventions can increase adherence if women are exposed to and find them usable. We compare exposure to and usability of interventions delivered via telephone vs. DVD.
Methods: Process evaluation measures from 926 women randomly assigned to telephone or DVD intervention and completing post-intervention surveys.
Results: ~83% of each group reported exposure to all content. Partial exposure was higher for DVD (9% vs. 0.4%; $p < .01$); no exposure was higher for phone (15% vs. 8%; $p < .01$). There were no differences in exposure by age or race. Full phone exposure was less likely for women who already made mammography appointments. Usability rating was higher for DVD ($p < .05$), driven by ratings of understandability and length. Usability of both interventions was correlated with lower baseline barriers, and higher fear, benefits, and self efficacy. Higher ratings for phone were associated with lower knowledge and contemplating mammography. Non-whites rated DVD better than whites.
Conclusion: Both tailored interactive interventions had wide reach and favorable ratings, but DVD recipients had greatest exposure to at least partial content and more favorable ratings, especially among non-white women.
Practice implications: This first evaluation of a tailored, interactive DVD provides promise for its use in mammography promotion.

1. Introduction

Despite recent controversies, there is no debate that regular mammograms facilitate mortality reduction [1–5]. Among US women 50–64, mammography within the last two years has declined 7% [6–8]. Interventions using translatable technologies are needed [9]. We developed *Mammograms Save Lives: Decide Today* – the first interactive tailored DVD promoting mammography use. Through a randomized controlled trial, we are comparing it with a tailored telephone intervention and with usual care.

DVD and phone interventions cover the same topics, and share tailoring variables and algorithms to select content based on responses to queries. However, they differ in interactivity and method of exposure. Telephone allows for live conversation but cannot use graphics or visuals; the DVD collects real-time information via remote control to deliver tailored narrative stories, graphics, and video.

For exposure, women must either interact with the telephone interventionist or use the mailed DVD.

Intervention studies often report both process and outcome evaluations [10]. Measuring exposure is important for interventions that require voluntary action (i.e., mailed interventions). Research has shown that interventions assessed favorably by users are also more effective for facilitating behavior change [11–16]. Because intervention effects vary by medium, participant demographics, beliefs, attitudes, and intentions, it is possible that these factors result in variations in exposure and reactions. Research questions are:

(1) Did intervention exposure differ (a) between DVD and telephone groups and (b) within groups, by participant characteristics?

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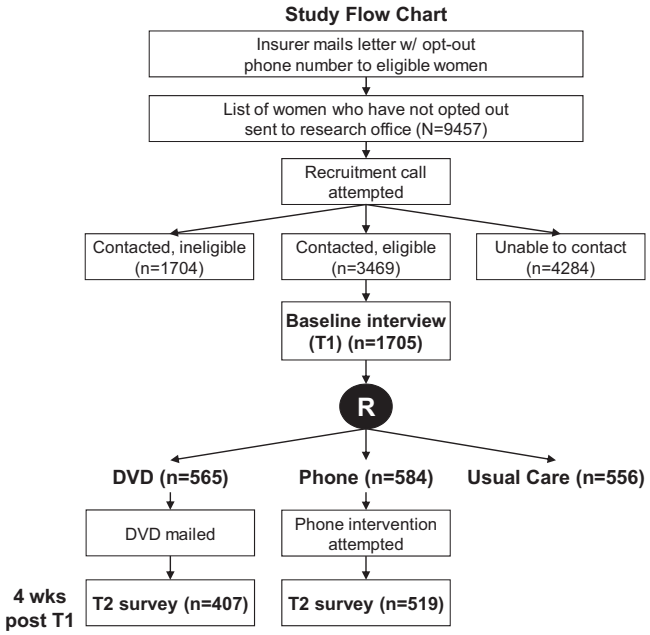

Fig. 1. Study flow chart.

(2) Among those exposed, did usability ratings differ (a) between DVD and telephone groups and (b) within groups, by participant characteristics?

2. Methods

2.1. Sample description

Participants were members of Methodist Medical Group (MMG) in Indiana and Blue Cross/Blue Shield of North Carolina (BCBSNC), ages 41–65, could read English, had no mammogram within 15 months, no previous breast cancer or bilateral mastectomies, and no physician advice to forego mammography. The 15-month adherence cut-off is consistent with US annual screening guidelines at the time of enrollment [17–19], plus a customary "grace period"[20–22]. Of 3469 women reached who had not had a mammogram within 15 months, 1705 (49.1%) consented and were randomly assigned (Fig. 1). We use data from 926 women (407 DVD and 519 phone) who completed follow-up surveys assessing exposure and usability.

2.2. Procedures

MMG and BCBSNC mailed letters with a brief study description and instructions for opting out of contact. Women not opting out were called to give verbal consent and HIPAA authorization, and complete baseline surveys. Post baseline, we mailed a DVD or attempted delivery of the telephone intervention over a four-week period. Follow-up phone surveys were administered one month post-baseline. Participants received gift cards for completing surveys. Study procedures were approved by Indiana and Duke Universities' IRBs.

2.3. Interventions

Interventions include messages tailored to variables from the Health Belief and Transtheoretical Models [23,24] previously associated with mammography use [13,25–39]. Sample cells for our intervention development grid appear in Table 1, showing theoretical constructs to be addressed, concepts to communicate, and script (telephone) or visual image and voiceover (DVD).

The DVD begins with a narrator introducing four women diverse in age, income, race, education, and reasons for non-adherence.[1] Questions about risk factors are presented, with tailored video segment responses. An anatomical animation of breast cancer metastasis and the procedure of having a mammogram are demonstrated. A series of video segments on barriers follows. If women respond positively to, e.g., "Is it hard to get regular mammograms because you don't have enough time?" they see a character overcoming the barrier. The DVD ends with the narrator encouraging viewers to overcome barriers and have a mammogram. Average use time was 10 min for DVD and 11.3 min for telephone, which had the same content adapted to a conversational format.

2.4. Measures

Baseline survey assessed demographics, mammography stage, and beliefs via validated scales [40–43]. Telephone interventionists coded content delivered (all, some, none). We measured DVD exposure via self-report at follow-up. Usability was assessed at follow-up with a scale from our previous work [44].

2.4.1. Analyses

Between-group comparisons used two-sided Fisher's exact test for exposure and Wilcoxon's rank sum test for usability score. Individual items were adjusted using the False Discovery Rate (0.05) [45]. Comparisons between participant characteristics and exposure/usability were performed within each group.

3. Results

Intervention groups were similar in baseline characteristics (Table 2).

3.1. Research Question 1 – intervention exposure

a. Some exposure was higher for the DVD; no exposure was greater for phone (Table 3).
b. Within-group analyses showed no differences in DVD exposure by participant characteristics. Telephone exposure differed by baseline stage, with full exposure lower for women who already had appointments (preparation) than those without appointments (69% vs. 85%, $p = .018$).

3.2. Research Question 2 – intervention usability ratings

a. Between-group analyses showed overall usability scores higher for DVD (Table 4). At the item level, after adjusting for multiple comparisons, more phone recipients reported it "took too much time". More DVD recipients agreed "information was easy to understand," and "time passed quickly" during the intervention.
b. Within both groups, higher perceived benefits and self efficacy, lower barriers, and higher breast cancer fear were associated with higher usability ratings (Table 5).

Within the DVD group, usability scores were higher among non-white women than Caucasians (75.1 vs. 71.2; $p = .001$).

[1] Actors in the DVD were recruited from the actors' guild in Athens, GA. The narrator was hired through *Voicecasting*, an Atlanta-based talent agency. Graphics, DVD jacket artwork, and DVD formatting, including an instructional demonstration for using the DVD, were developed by *Eo Studios* in Athens, GA.