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Daughter-Initiated Cancer Screening Appeals to Mothers

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Abstract

Youth-initiated health interventions may provide a much needed avenue for intergenerational dissemination of health information among families who bear the greatest burden from unequal distribution of morbidity and mortality. The findings presented in this paper are from a pilot study of the feasibility and impact of female youth-initiated messages (mostly daughters) encouraging adult female relatives (mostly mothers) to obtain cancer screening within low income African American families living in a Southern US state. Results are compared between an intervention and control group. Intervention group youth (n=22) were exposed to a 60-minute interactive workshop where they were assisted to prepare a factual and emotional appeal to their adult relative to obtain specific screening. The face-to-face workshops were guided by the Elaboration Likelihood Model (ELM) and the Theory of Planned Behavior (TPB). Control group girls (n=18) were only provided with a pamphlet with information about cancer screening and specific steps about how to encourage their relative to obtain screening. Intervention youth (86%) and adults (82%) reported that the message was shared while 71% in the control group reported sharing or receiving the message. Importantly, more women in the intervention group reported that they obtained a screen (e.g., mammogram, Pap smear) directly based on the youth's appeal. These findings can have major implications for youth-initiated health promotion efforts, especially among hard-to-reach populations.

Keywords

Cancer prevention; early detection; upward communication; African American families; mother-daughter communication; cancer disparities

Introduction

Child-initiated health interventions provide a promising avenue for intergenerational dissemination of health information. Children have increasingly become active partners in health promotion initiatives positively impacting their own health, as well as that of their families and communities [1-3]. Furthermore, a number of studies have indicated that parents are receptive to receiving health information from their children [1-4]. Despite the fact that this is a deviation from the customary parent-to-child information flow [3-6], this

receptivity on the part of the parent positions the child-parent relationship as an ideal conduit for sharing health information. More importantly, the upward flow of health information recognizes that youth have varied access to health information and can potentially be leveraged to influence their parents' health behaviors.

Cancer disparities, particularly as they impact racial and ethnic minorities, continue to be of great concern both in terms of incidence, stage at diagnosis, and morbidity rates [7-9]. These continued disparities at varying levels of the cancer continuum suggest a critical need for interventions that are innovative and can span generations. Researchers in developing nations have undertaken health promotion research that capitalizes on the assets of children as channels for health messaging and education, including a number of efforts in Africa [3, 6, 10]. From these studies, there is empirical evidence that suggest that utilizing active forms of learning (e.g., participatory learning) and local expressions of knowledge (e.g., poems, songs) with youth can enhance the persuasive appeal to their relatives and have the potential to improve knowledge and health related behaviors [3, 6, 10]. More recently, researchers in Australia explored the potential for adult daughters (18-39 years) to deliver mammography promotion messages to their screening-eligible mothers [4]. This study noted that though the mammogram communication that occurred was primarily in the downward direction (from mother to daughter), the pairs were amenable to a two-way conversation on the topic when prompted. Similarly in the United States, in a sample of American college women, Kratzke and colleagues examined the types of breast cancer prevention information-seeking information given to mothers [11]. Based on self-report survey information, 18% of college women had given information to mothers, with screening information being the most frequent type. Predictors for giving information to mothers included seeking information online, breast self-exam practice, and more senior academic standing [8]. Child-initiated health interventions have the potential to provide an avenue for intergenerational dissemination of health information in developed nations. One study conducted in a Midwestern city examined the feasibility of African American and Hispanic mothers from inner-city neighborhoods accepting cancer screening advice from their adolescent daughters [5] and found that female youth (ages 12-17) could potentially serve as opinion leaders for their mothers regarding health-related topics, including cancer screening.

Developing a Quality Message

Research on how to best deploy this upward communication approach, from child to parent, effectively is limited [12, 13]. The Elaboration Likelihood Model (ELM) lends a helpful framework for understanding the impact of persuasive messages and their effective messaging components [14]. The ELM posits that message strength and perceived topic saliency influence attitude change. Furthermore, traits of the messenger can also affect the extent to which the recipient attends to the message, including the credibility of the source and their motivation for providing the cancer message [15]. Additional messaging characteristics that can prompt a person to elaborate on or more closely attend to a persuasive message include personal relevance of the message and argument repetition. Optimizing these characteristics during message delivery can increase the likelihood of message effectiveness. Utilizing components emphasized by the ELM, preliminary studies

in the United States have been conducted to explore the possibilities of health promotion utilizing the child as the health advocate.

The goal of the current research is to report on findings from a community-based study that assessed the feasibility of an upward communication by adolescent females to influence their female family member to obtain recommended breast and cervical cancer screenings, or to consult with their doctor regarding their need for a colonoscopy. American Cancer Society screening recommendations at the time of study recruitment were women over 40 to obtain a yearly mammogram, a Pap smear once every 24 months, and if age 50 or older, screening for colon cancer.

Research Methods

Design and Setting

This youth-initiated screening feasibility study is being evaluated in a community-based setting using a two group design, stratifying based on neighborhood location. This approach avoids contamination that could occur with randomization at the individual level when youth are recruited from the same locations. This study was approved by the academic Institutional Review Board.

Participants

We recruited African American women age 40 or older, who also reported being uninsured or underinsured, and/or were non-compliant with screening recommendations for either breast, cervical, and/or colon cancer. In addition, adults also needed to enroll with a female kin (daughter or relative) 12 to 17 years old. Youth exclusion criteria included being pregnant or having a child, and not having been in school in the past six months.

Recruitment and Consent

In order to engage participants meeting the selection criteria, we recruited primarily from low to middle income, urban neighborhoods during a one-year period. Recruiters held multiple face-to-face informational meetings at a variety of sites including community centers and churches. We conducted an informational meeting with either the youth or the adult. If the youth was the initial contact, we determined interest and if she was able, asked her to contact her mother or take informational material home. Daughters would tell her mothers of the study, and if the mother was interested she would then talk to the researcher. If adults were the first point of contact, we inquired about eligibility criteria for the dyad. In cases where an adult was ineligible, we asked her to share the information with a relative who could participate with her daughter. The goal was to recruit at least 20 dyads in each group.

Once the dyad was determined eligible, they met with project staff to complete the informed consent process. Girls were asked separately about their willingness to participate and completed written assents. In cases where the youth was not participating with her mother, we first obtained written parental consent prior to conducting the assent/consent process with the eligible dyad. At the baseline assessment, adults were asked permission to share

their screening information with the participating youth. We also requested permission to access the adults' medical records at the end of the study, with the stipulation that these would only be accessed if they received services from one of the community clinics affiliated with the researchers' institution. All adults received $30 after completing the baseline and $50 after completing the exit interview, and all youth received a total of $65. The baseline and exit interview each lasted approximately one hour. The face-to-face workshop lasted approximately 60 minutes.

The Intervention and Control Conditions

Intervention Group

Educational Content: A trained facilitator provided a 15-minute PowerPoint presentation to groups of four to six participants. She introduced cancer disparity data specific to African Americans as well as American Cancer Society screening recommendations. These slides provided information that was intended to be helpful in the development of the appeal message.

Provided with a 3G's Pamphlet: Based on previous research [12] and best practices, we emphasized the importance of regular screening and follow-up visits based on test results. Youth in the previous study suggested the use of the 3G's moniker as a message prompt. The 3G's message includes: **G**oing to the doctor early to detect cancer, **G**oing for cancer screening regularly, and **G**oing for follow-up visits from test results, if necessary. Each participant was provided a 3G flyer at the end of the session.

Sealed Envelope: After the PowerPoint, youth were provided with a sealed envelope that contained specific information about the screening that their mother or adult relative needed titled *Develop My Plan and Role Play.* The envelope was sealed to denote privacy. The youth had the opportunity to role play and practice delivery of a personalized screening message to their relative with the group facilitator. They used role play to simulate delivery of the message and brainstorm any prospective challenges. The Theory of Planned Behavior (TPB) served as the action planning framework in this intervention and was used to help youth develop appeal messages targeting what they knew about the adult partner's behavior. TPB is commonly used to understand and identify the mechanisms of behaviors that one has volitional control over [16]. TPB holds that one's behavior is guided by behavioral intentions, which are a product of attitude, perception of social norms, and one's perception of their ability to control their own behavior [16, 17].

Text after Message Delivery: Youth were asked to text the project coordinator once they delivered the message to their relative. Eighty three percent of youth reported having a cellphone. Youth without access to a cellphone were encouraged to call or email the coordinator.

Youth Follow-up with Adult: Youth were encouraged to follow up with the adult about the appointment.

Control Group—Immediately after completing the baseline interview, youth were provided with the same pamphlet that the intervention group received: a tri-fold, double-sided pamphlet titled “The 3Gs of cancer screening. What your relative should know. What YOU can do to help. A guide for youth.” The pamphlet also outlined six steps they could take to help their relative get screened. In addition, the 3G pamphlet contained a list of local and other resources for screening.

Procedures

We sought to evaluate this intervention using a two-arm study design. All 80 participants recruited were invited to complete a baseline interview. Scheduling and follow-up required at least three telephone reminders to the adult for the baseline interview. After three no-shows, the dyad became ineligible for study participation. Eighteen control group participants (n=18) completed their baseline. After completion of their baseline interviews, intervention youth (n=30) were invited to attend a one-time 60-minute workshop. A total of 22 youth attended five different workshops. About three months after the baseline interview, we scheduled an exit interview with dyads. There were at least two opportunities for dyads to be no-shows for the exit interview, after which they were no longer eligible to participate. There was 22% attrition from the control group and 27% from the intervention group.

Participant Measures—For both adult and youth, measures of perceived parenting style, cognitive processing style, mother-daughter connectedness [18], quality of communication [19], and cancer worry [20] were assessed at baseline. The mother-daughter questions were specific to the participating dyad and either referenced the mother or family member. Specific to youth, we assessed cancer knowledge, their relationship with the adult, concern with adult's health, and the youth's own risk behaviors. For adults, we assessed family demographics, health-seeking behaviors, screening behaviors, access to care, and their perception of the youth's perceived goodwill [21]. Adult participants also responded to questions about breast, cervical, and colon cancer screening history, knowledge about screening recommendations, and perceived barriers to screening.

At the exit interview, we assessed variables related to the sharing of the cancer screening appeal message including the context in which it was shared, the length of the conversation, details on the information shared, the adult's response to hearing the message, and whether the youth followed-up after the initial appeal. We also assessed the adults’ recollection of the message sharing, their perceptions of the quality and relevance of this message, their intention to be screened as a result of this message, and whether or not the adult had actually obtained the recommended screening services. All questions were read aloud and responses were verbal. Likert and bi-polar opposite scales were pre-printed onto cue cards that were used during each interview to ensure participants considered the full range of each scale when responding to individual items.

Data Analysis

Descriptive statistics for the adult participants’ demographic characteristics are presented in Table 1. Descriptive characteristics for the intervention and control group were compared using t-test (continuous) and chi-square comparisons (categorical); differences significant at

$p < .05$ are reported. Chi-square tests were used to compare the message sharing variables between the two groups. A significance level of .05 was employed and directional, one-sided tests were used. Within group comparisons were also performed and are reported as congruency comparisons between the youth's report of their messaging behavior and the adult's agreement that the behavior did in fact occur (Table 2). Message delivery behaviors and congruence between adult and youth reports were analyzed and are presented in five categories: 1) message was shared and received (message received is noted if the message was confirmed by both members of the dyad), 2) message was shared the same day, 3) youth directly asked the adult to get screened, 4) youth explained why screening was important to adult within the message, and 5) youth followed up about screening (Table 2). All message delivery behavior are self-reported. Given the small sample size and the low number of cases in each cell, parametric testing was not done on screening behavior data.

Results

Sample Demographics

Forty-eight dyads (n=96) completed the baseline interview, 30 from the intervention group and 18 from the control group. Thirty-six dyads (75%) completed the exit interviews, 22 from the intervention group (73%) and 14 from the control group (78%), resulting in 25% attrition overall. The majority of adults reported hearing about the study at a community location (n=24, 67%), 11% said they first heard about the study from the youth, and 6% said they heard from another adult. The primary recruitment was to adults; most youth heard about the study from their mother or the adult relative (n=27, 75%). All study participants self-identified as African American. The average age of the youth was 15 and the average age of adults was 52 (see Table 1 for other demographic variables). The intervention group had higher rates of unemployment (Chi-sq (3)= 9.11, $p < .05$ and lower educational attainment (chi-sq (2) = 10.3, $p < 05$). No other comparisons between the demographic characteristics reported in Table 1 were significantly different.

The majority of the dyads were daughter/mother pairs (n=30, 63%) or granddaughter/grandmother pairs (n=15, 31%). The sample included niece/aunt pairs (n=2, 4%) and goddaughter/godmother pairs (n=1, 1%). The majority resided in the same household (n=32, 67%) with one-third (n=16) not living in the same household. There were no differences in percent between the two groups who reported living in the same household. However, there were slightly more mother-daughter pairs in the control group (64%) compared with the intervention group (55%). All the adults were non-compliant with screening recommendations for at least one cancer and 17% were non-compliant for all three cancers (see Table 1).

Intervention Group

Message Sharing Behaviors in Intervention Youth—More than two-thirds (74%, n=14) sent a text to the coordinator to say they shared the screening appeal with their female relative. Eighty six percent (n=19) of the youth reported sharing the appeal, while 82% of adults (n=18) reported having received the appeal (see Table 2). Of those who shared the appeal, 67% lived in the same house with no significant differences between the groups. The

agreement in responses between intervention dyads was high (see Table 2). More than half (59%) of the adults stated that the youth provided them with the 3G's pamphlet, 50% said the youth talked to them about the 3G's, and 55% said the youth spoke about the importance of being checked early and regularly.

Screening Appeal Uptake in Intervention Group Adults—Five reported (42%) making an appointment and all five obtained a mammogram. For the Pap smear, one-third reported making an appointment and one (17%) obtained a Pap smear (see Table 3). The majority (80%) said they talked with their doctor about the need for a colonoscopy and 33% reported receiving a colonoscopy based on their doctor's recommendation.

Control Group

Message Sharing Behaviors in Youth—In the control group, 71% (n=10) of both the youth and adults reported that the youth shared the cancer message (see Table 2) and there was complete agreement (kappa = 1.0). However, agreement on the other variables was low (see Table 2). Fifty percent of youth said they shared the message the same day and only 14% said they asked the adult to obtain screening. Of those who shared the message only two said that they followed up with the adult. Only 43% indicated that they were given the 3G's pamphlet and 29% said that they remember hearing or reading about the 3G's; however, only one participant could recall the specifics. Of those adults who said they received the appeal, 70% lived in the same household with the youth.

Screening Appeal Uptake in Control Group Adults—Two of the seven (29%) reported receiving a mammogram based on the youth's appeal (Table 3). Three of the seven (43%) reported making an appointment (43%) to be screened. No one (n=5) in this group obtained a Pap smear. Only two of five indicated that the appeal was made and one of two said they made an appointment. No controls made an appointment to speak with their doctor about a colonoscopy.

Intervention and Control Group Comparisons

Message Sharing Behaviors—Both the youth (chi-sq (1) = 9.93, $p < .04$)) and adults (chi-sq (1) = 8.72, $p < .05$)) in the intervention group were more likely to report that the youth shared the cancer message the same day when compared to the control group. Similarly the youth (chi-sq (1) = 21.31, $p < .001$)) and adults (chi-sq (1) = 14.77, $p < .01$)) in the intervention groups said that the intervention were more likely to indicate why screening is important and to follow up with the adult after the initial request. Overall, youth and adults in the intervention group reported significantly higher level of endorsement compared to the control group.

Discussion

This is one of the first studies to provide preliminary empirical evidence that youth within familial dyads are able to provide an adult with cancer screening information and that adults would be willing to respond to a youth appeal about cancer. This study highlights several important points about the feasibility of upward communication for cancer prevention. First,

youth in both groups successfully provided their adult family member with cancer screening information that resulted in actual behavior change for at least one-third. Intervention youth shared the appeal with 82% and equally significant is that in the group with the minimal intervention, 71% shared the appeal. Second, of those who indicated that they received the appeal, at least one-third did not live in the same home with the youth, which may suggest that youth are able to make screening appeals to family members who live outside the home. Third, intervention youth were more likely to share the message immediately. Finally, not only did adults report that they would listen to a youth about cancer appeals but several of them reported that they obtained screening based on the youth's appeal. In the intervention group, mammogram uptake was at 42%, cervical cancer at 29%, and 80% talked to a provider about the need for colon screening.

While both groups shared the cancer screening information and made an initial appeal that is where the similarities between the two groups concluded. The differences provide direct insight about the feasibility of a daughter-initiated intervention. First, the intervention group was more likely to share the information on the same day and their appeal was direct and included the 3G's (going to the doctor early, going regularly, and going for follow up visits). This result suggests that the targeted and tailored appeal with information about the screening(s) their relative needed was effective in assisting the youth to make a direct emotional and factual appeal. There were also differences between the two groups and the use of the pamphlet. More intervention adults (72%), compared to the control (43%), reported that they received the pamphlet. However, it is unclear from the data exactly how the pamphlet was used as part of the youth's message sharing and future studies will need to further explore the utility of the pamphlet. Pamphlets were included given that other youth suggested that written information would be useful to supplement the verbal appeal [12]. Intervention youth also followed-up with their relative after the first verbal appeal suggesting that the face-to-face workshop format accompanied by specific information regarding screening needs and providing role playing opportunities was successful in assisting youth to not only make the appeal but also to follow-up with the adult.

In addition, this study also provides some insights about the intervention content and implementation. First, intervention youth responded well to the content of the workshop, especially the association between cancer disparities in the African American community and highlighting their own emotional connection with the study adult. In both groups, the proportion of adults who said that the youth provided a personal appeal combined with factual information about screening was high. Youth were equally likely to provide the appeal to dyads who lived with them as well as dyads outside of their home. However, the separate living arrangements created scheduling challenges for research purposes. Scheduling the workshops presented an additional challenge. Even though workshops were held at a community location and in the late afternoon, youth often had after-school activities and coordinating their schedule with the adult that would transport or accompany them often proved burdensome. Future studies recruiting youth-adult dyads will need to allow for more flexible strategies to delivering the intervention content.

Limitations

The results of this pilot study should be treated as preliminary and primarily provides description data. There are several limitations with regard to interpreting the screening outcomes. The main limitation is that the screening data is self-reported. Adults consented to having their medical records reviewed only if they attended a clinic affiliated with the academic institution. At time of the baseline, and at the exit interview they were asked to indicate where they normally receive care. No one in the control group and the majority (6/8) in the intervention group indicated that they obtained screening at outside facilities. As such, we were unable to verify the medical records of those who reported being screened and therefore screening results should be considered preliminary. Given that this was a community-based study and our goal was to identify women who were not screened, we were unable to ensure that women would receive care at one of the affiliated clinics. Future studies could easily expand the request for medical records to include any medical facility. If necessary, future community-based studies could limit enrollment to those who receive care from certain locations, although this might be somewhat unrealistic. The lack of agreement on most of the responses for the control group must be considered in the interpretation of the findings. The tendency towards more positive answers for the control adults suggest that there may have been a strong element of self-serving bias present in their exit responses. Additionally, given the challenges with follow-up, there was significant variability in the time between the workshop and the exit interview, which may bring into question issues related to accurate recall, although the strong congruence between intervention youth and adult responses diminishes this particular concern for this group. Phones of the participating adults were often disconnected and even when appointments were made, emergencies would arise that would prevent the dyad from keeping the appointment. All appointments were held at a community location very close to where the participant resided; however, time and other barriers often resulted in interviews needing to be rescheduled. The unequal size of the two groups was unintended and is an indication of the difficulty associated with conducting follow-up or of having multiple contact points with this underserved population. Finally, connectedness between the dyads were assessed by modifying the relationship questions on the mother-daughter connectedness survey. Although the original questions specifically asked about the mother-daughter relationship, for this study, we modified the questions to reflect the relationship of the dyad (mother, aunt, grandmother, etc.). While expanding the reference beyond the mother-daughter relationship acknowledges the varying types of kinship within some African-American families, the inclusion of other relationships and its impact on mother-daughter connectedness must be viewed as a limitation and the results should be interpreted with caution.

Despite these study limitations, the majority of youth successfully shared the cancer screening appeal with an adult. Even those only provided with a pamphlet shared the information with the adult partner. In this study, as has been suggested in previous work [5, 6], young people are willing and able to share messages in an upward direction and these findings may hold promise for other areas of health promotion. Furthermore, this study suggests that young people are able to share cancer-screening information not only in a setting of proximal ease, but they are also able to share it with adults outside the home.

This study highlights multiple areas for future research. The intervention is able to activate youth to deliver a cancer screening appeal and holds promise for upward health promotion messaging. However, future research needs to more fully examine the mode of message delivery (workshop), the role of written material, youth follow-up with mothers, and the specific variables that may predict adults responding positively towards a cancer appeal. In future studies examining upward communication, researchers will need to examine how health promotion materials are used to augment the verbal appeal. In particular, future studies need to examine how the pamphlet was used; was the appeal made in direct reference to the written information or was the pamphlet only provided as a handout to support the verbal appeal? While complete dyad agreement is unrealistic, more research is needed about the factors that may influence message agreement. Future research needs to examine the role of youth in assisting adults to move from the appointment to actual screening phase. Furthermore, future studies examining the impact of youth-initiated appeals on screening should seek participants' permission to seek medical records from their providers. Importantly, future intervention designs must address these logistical challenges programmatically and develop an intervention that will minimize attrition rates. For example, using technology to persuade youth to make similar appeals to adults may be more feasible and would eliminate the logistical challenges of face-to-face interactions. Furthermore, future research needs to assess changes in and impact of knowledge sharing between dyads over time.

Conclusion

Currently, there is a paucity of literature regarding the effect of upward communication in promoting screening behaviors. This is one of the first known studies in the US to report on the outcomes of a youth-initiated screening appeal made to a mother or to another female family member. Further, the population of focus was a historically underserved group of women facing high levels of poverty and unemployment. The reported income of our sample was well below the nationally recognized poverty threshold [22] and while more than half received Medicaid or Medicare, all of them were non-compliant with at least one screen, and therefore made this a very high-risk sample, especially as it pertains to early detection [23-25]. These findings provide useful insights for understanding the feasibility of youth-initiated cancer screening messages with family members, including the importance of emotional and factual messaging, and centering the need for early detection within an appeal to reduce cancer disparities, especially of low-income women. Furthermore, the high rate at which the youth shared the screening information is encouraging, especially about cancer, a subject that youth are not usually known to initiate with adults. Young people's access to a diverse array of education modalities and their trusted position with the family member may enhance their ability to be perceived as credible messengers with close proximity to their relatives.

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Table 1

Adult Participant Demographics for Intervention and Control Groups

	Intervention (n=22)	Control (n=14)
Age	53	51
Marital Status		
Single, never married	41% (9)	43% (6)
Divorced/Separated/Widowed	50% (11)	50% (7)
Married	9% (2)	7% (1)
Education		
Completed high school/GED or less	55% (12)	71% (10)
Some College	23% (5)	14% (2)
College Diploma	14% (3)	7% (1)
Graduate School	5% (1)	7% (1)
Other	5% (1)	--
Employment		
Unemployed and seeking employment	50% (11)	7% (1)*
Employed part-time	18% (4)	21% (3)
Employed full-time	18% (4)	43% (6)
At home and not seeking employment	14% (3)	29% (4)
Annual Income		
>$5,000	46 % (10)	21% (3)*
$5,000-$20,000	31 % (7)	29% (4)
>$20,000	23% (5)	50% (7)
Health insurance		
None	18% (4)	14% (2)
Subsidized	68% (15)	57% (8)
Employer plan	14% (3)	29% (4)
Had difficulty getting/ unable to get medical care	36% (8)	21% (3)
Cancer screening non-compliance		
Breast cancer	73% (16)	64% (9)
Cervical cancer	46% (10)	36% (5)
Colon cancer	50% (11)	36% (5)

$p < .05$

Table 2

Dyad Congruency Regarding Message Sharing Behaviors of Youth for Intervention and Control Groups

	Intervention			Control		
	Youth	**Adult**	**Congruency Comparison**	**Youth**	**Adult**	**Congruency Comparison**
	% (n)	**% (n)**	**X^2, p value; kappa**	**% (n)**	**% (n)**	**X^2, p value; kappa**
Message or information was shared	86 (19/22)	82 (18/22)	15.6, p < .0001; .83	71 (10/14)	71 (10/14)	14.0, p <.001; 1.0
Message or information was shared the same day	74 (14/19)*	45 (10/18)*	20.0, p < .0001; .55	50 (5/10)	30 (3/10)	17.5, p < .01; .40
Youth asked adult to get screened	95 (18/19)***	100 (18/18)**	22.0, p < .0001; .85	14 (2/14)	43 (6/14)	3.11, p > .07; .36
Youth said why screening is important	94 (17/18)***	89 (16/18)*	22.2, p < .0001; .66	50 (1/2)	100 (6/6)	3.11, p > .20; .25
Youth followed up after first conversation	74 (14/19)**	67 (12/18)*	16.8, p < .01; .28	20 (2/10)	30 (3/10)	15.2, p < .05; .28

*** are significant for comparison between Intervention and Control within age (e.g., youth intervention compared to youth control

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Table 3

Screening Appeal Uptake by Adults, for Intervention and Control Groups

	Needed to be screened		Of Those who an Received Appeal			
			Made an appointment to be screened		Obtained screening	
	Intervention % (n)	Control % (n)	Intervention % (n)	Control % (n)	Intervention % (n)	Control % (n)
Breast cancer screening	73 (16)*	64 (9)	42 (5 of 12)	43 (3 of 7)	100 (5 of 5)	67 (2 of 3)
Cervical cancer screening	46 (10)	36 (5)	33 (2 of 6)	50 (1 of 2)	50 (1 of 2)	0 (0 of 1)

	Needed to be screened		Of Those who Received an Appeal			
			Talked to a health professional about screening		Obtained colonoscopy	
	Intervention % (n)	Control % (n)	Intervention % (n)	Control % (n)	Intervention % (n)	Control % (n)
Colon cancer screening	50 (11)	36 (5)	80 (8 of 10)	0 (0 of 1)	33 (2 of 6)	0 (0 of 2)

*The denominator only refers to those non-compliant with the specific screening