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Family Ties: The Role of Family Context in Family Health History Communication about Cancer

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Abstract

Family health history about cancer is an important prevention and health promotion tool. Yet, few studies have identified family context factors that promote such discussions. We explored relations among family context (cohesion, flexibility, and openness), self-efficacy, and cancer communication (gathering family history, sharing cancer risk information, and frequency) in a diverse group of women enrolled in a randomized control trial. Baseline survey data for 472 women were analyzed. Average age was 34 years, 59% identified as Black, 31% graduated high school, and 75% reported a family history of any cancer. Results showed that greater family cohesion and flexibility were related to higher communication frequency and sharing cancer information. Women who reported greater self-efficacy were more likely to have gathered family history, shared cancer risk information, and communicated more frequently with relatives. Openness was not associated with communication but was related to greater family cohesion and flexibility. Adjusting for demographic variables, self-efficacy and family cohesion significantly predicted communication frequency. Women with higher self-efficacy were also more likely to have gathered family health history about cancer and shared cancer risk information. Future research may benefit from considering family organization and self-efficacy when developing psychosocial theories that, in turn, inform cancer prevention interventions.

Keywords

cancer; communication; family health history; family organization; self-efficacy

Introduction

With recent advances in genomic medicine there has been a collective effort from health organizations and policy-making bodies to recognize the importance of family health history. Several initiatives, including the CDC's Family History Public Health Initiative and

the Department of Health and Human Services' HealthyPeople 2020, advocate for increased awareness and utilization of family health history in clinical practice as an effective tool for stratifying disease risk. Specifically, a positive family health history gives families an advantage in recognizing when they are at an increased risk for certain health conditions, including cancer (Guttmacher, Collins & Carmona, 2004). Leading organizations in the area of cancer prevention and control (e.g., U.S. Preventive Services Task Force; American Cancer Society; National Comprehensive Cancer Network) strongly recommend that cancer screening schedules be tailored according to family health history. Consequently, family health history discussions about cancer are imperative to raise awareness of family-specific risk and to signal preventive action.

Family health history communication about cancer involves two processes: (1) gathering specific information from family members about the collective cancer history, and (2) actively sharing this information with other family members (Bodurtha et al., 2014). To date, multiple tools (e.g., Family Healthware™, Yoon et al., 2009; Rubinstein et al., 2011; U.S. Surgeon General's My Family Health Portrait; <https://familyhistory.hhs.gov>) have been made available to families and healthcare providers to facilitate these discussions and for use as a potential screen for cancer risk (Yoon et al. 2002; Wang et al., 2015). However, despite wide recognition of family health history as relevant for one's health many Americans remain unaware that they may be at increased disease risk based on their family history alone potentially because this information is not being communicated within families. To illustrate, most respondents (96%) to a national survey believed that their family history was important; yet, only 30% had actively collected family health information from their relatives (Yoon et al., 2004). Moreover, Kaphingst et al. (2012) found that 34% of participants reported little or no communication with family members about their family health history (diabetes, heart disease, and cancer). These rates highlight a significant need to better understand factors that facilitate or impede health history communication within families.

Cancer risk communication is an intricate and dynamic process. When presented with the task of gathering and sharing health risk information, individuals may encounter barriers (i.e., emotional concerns for self and others; lack of knowledge and accurate information) that make this transactional process challenging. Research has identified important socio-demographic factors that play a role in health history communication. For instance, significant-others have been identified as the initial "go-to" family member when it comes to sharing information about genetic test results (Fosters, Eeles, Ardern-Jones, Moynihan, & Watson, 2004; Julian-Reynier et al., 2000). Women are seen as family health historians and the responsible ones for communicating health information within the family (Koehly et al., 2009; Nycum, Avard, & Knoppers, 2009; Wiseman, Dancyger, & Michie, 2010). A generational pattern has also emerged, with older generations often adopting a sense of responsibility for communicating and sharing information about family health history with younger generations (Ashida & Schafer, 2015; Hovick, Yamasaki; Burton-Chase, & Peterson, 2015; Yamasaki & Hovick, 2015). Cultural differences have also been found, with Latinos and African Americans holding certain beliefs (e.g., shame; fatalism) and values (e.g., maintaining independence; protecting relatives from worry) that are negatively

associated with family health history communication (Haggstrom & Shapiro, 2006; Kinney, Gammon, Coworth, Simonsen, & Arce-Laretta, 2010; Yamasaki & Hovick, 2015).

Although the aforementioned findings have provided insight into the conditions that are likely to improve or deter family health communication, there is much to learn regarding the contextual variables within the family environment that influence these discussions and can be targeted in prevention efforts. Largely missing from the literature are studies focusing on the family context (e.g., family organization, communication style) and individual factors (e.g., self-efficacy), and its impact on family communication about family health history specific to cancer.

The role of family organization in family health history communication is understudied. From a family systems perspective, families are better understood as a unit, where communication serves as the medium through which shared beliefs, feelings, and emotions are transmitted and family functioning is maintained (Bowen, 1976; Peterson, 2005). This perspective recognizes the importance of family organization in family functioning. According to the Circumplex Model of Marital and Family Systems (Olson, 2000; Olson & Gorral, 2006) family organization – the way family members relate to one another – consists of three domains: cohesion (i.e., the emotional bonds among family members), flexibility (i.e., the quality and expression of leadership and organization within the system), and communication (i.e., the vector through which families attempt to balance cohesion and flexibility). When faced with stressful situations, such as knowledge of cancer in the family, the systems' functioning maps onto the balanced or unbalanced dimensions of cohesion and flexibility which in turn has implications for the family's well-being. In this model, communication is seen as a facilitating dimension that helps families find balanced levels of cohesion and flexibility to achieve optimal functioning. Utilizing this perspective, Harris et al. (2010) found that higher levels of family cohesion and flexibility were associated with perceiving more open platforms for sharing health information with relatives as well as greater support for melanoma discussions within families. Moreover, Ashida et al. (2013) found that participants reported having shared family health information with those whom they felt close to, provided emotional support, and engaged in contact more frequently. Accordingly, intra-family closeness has been identified as an important consideration in communication about family health history (Claes et al., 2003; Nycum, Avard, & Knoppers, 2009; Hay, Shuk, Zapolska et al., 2009).

Communication style may also illuminate the impact of family context on communication about cancer family history (Kenen, Arden-Jones, & Eeles, 2004). Harris et al. (2010) found that out of 313 participants with melanoma in the family, less than half (42%) reported that their families had an open communication style. In that sample, 28% of participants reported that sharing information about melanoma with first-degree relatives was a difficult process, and they perceived significant barriers to communication (i.e., direct refusal or lack of responsiveness to discuss health history). These findings suggest a connection between a family's organization and the style in which family members communicate. Although not extensive, research suggests that families who are open to communicate about cancer may collect and transmit valuable cancer risk information through the family system, aiding cancer prevention and control.

Perceived communication self-efficacy may be another important factor that promotes discussions about cancer risk. First developed under the framework of Bandura's (1977) social cognitive theory, self-efficacy has been studied in many areas of health behavior change and is defined as the belief in one's ability to carry out specific actions that produce desired outcomes (Bandura, 2004; Campbell, Dunt, Fitzgerald, & Gordon, 2013; Falzon, Radel, Cantor, & d'Arripe-Longueville, 2014). Bandura (2004) posited a direct relationship between perceived self-efficacy, goal setting, and a strong commitment to engage in a behavior. As such, a higher sense of self-efficacy to communicate with relatives may indicate a stronger commitment to learn about cancer risk and take action to reduce risks. For instance, one study found that participants with high genetic self-efficacy (i.e., understanding, assessing, and explaining the role of genes in health) were almost twice as likely to know their family health history and perceive it as 'very important' (Ashida, Goodman, Stafford, Lachance, & Kaphingst, 2012). In a sample of older adults, Ashida and Schafer (2015) found that higher self-efficacy to share family health history was significantly associated with having shared such information with more relatives. Moreover, utilizing the theory of motivated information management, researchers found communication self-efficacy to be a robust predictor of seeking family health history information providing strong support for inclusion in investigations surrounding cancer risk communication (Hovick, 2014; Rauscher & Hesse, 2014).

With the added contributions of genetic testing for certain hereditary cancers and the repercussions this information may have for the family in terms of risk, understanding family health communication becomes highly relevant to cancer prevention and control efforts. To this end, the present study examined relations between family organization (cohesion and flexibility), communication openness, self-efficacy, and family cancer history communication in a diverse sample of women. We hypothesized that higher levels of cohesion and flexibility, a more open communication style, and higher communication self-efficacy would be associated with gathering family cancer history information, sharing cancer risk information, and a higher frequency of family communication about cancer.

Method

Participants

A total of 490 women were recruited from the Women's Health Clinic at Virginia Commonwealth University Medical Center between July 2010 and January 2012. Participants were enrolled in the KinFact Study, a randomized control trial that examined the effect of a brief intervention on family communication about hereditary cancers (Bodurtha et al., 2014). Participants were eligible for KinFact if they were: (a) 18 years or older; (b) a patient of the clinic; and, (c) English-speaking. Seventeen participants were excluded from analyses because they reported being adopted and one participant was excluded due to missing data. The final sample was comprised of 472 women. Table 1 presents socio-demographic data.

Procedure

Participants were recruited following appointment registration at an outpatient women's health clinic, where they were receiving routine medical care. Participants provided a three-generation cancer-focused pedigree, completed baseline measures, and were then randomized to either the intervention or control group, followed by assessments at 1, 6, and 14 months post-baseline. See Bodurtha et al. (2014) for detailed information about the clinical trial. Analyses for the current manuscript focused exclusively on the baseline assessment given that data on family context were only collected at this initial time-point. As such, data from the final sample of 472 women (regardless of random assignment) were analyzed. Women received honoraria after completing each phase of this longitudinal study totaling approximately \$40.

Measures

Socio-demographic information—Participants reported their age, race/ethnicity, marital status, living arrangements, highest education level completed, and any family history of cancer in first- or second-degree relatives. Health insurance status was recorded from electronic medical records.

Family organization—The Family Adaptability and Cohesion Evaluation Scale, 4th edition (FACES-IV: Olson, Gorall, & Tiesel, 2007) assessed family cohesion and flexibility levels. The measure consists of 42-items rated on a 5-point Likert scale from 1 (*strongly disagree*) to 5 (*strongly agree*), and yields six subscales that map onto the cohesive or flexible dimensions. Ratio scores for both cohesion and flexibility were utilized to assess the perceived level of functional versus dysfunctional behavior in the family system within these dimensions. This ratio score summarizes a family's relative strengths and problem areas into a single, continuous score. The lower the ratio score is below one, the more unbalanced the system. Conversely, the higher the ratio score is above one, the greater balance within the system. FACES-IV has been well-validated and has shown strong internal consistency (Olson, 2011). For this study, the Cronbach's alpha for the six scales ranged from .68–.87.

Communication openness—A modified version of the Openness of Discussion in the Family Scale (Mesters et al., 1997) assessed communication openness, and included six items rated on a 4-point Likert scale ranging from 1 (*strongly agree*) to 4 (*strongly disagree*). Participants rated the extent of health communication in the family, focusing on both the individual's willingness to share and the family's openness to receiving the information. Higher scores reflect a more favorable and open environment for family health communication. The measure has demonstrated excellent reliability in past work, $\alpha = .86$ (Mesters et al., 1997), as well as in the present study, $\alpha = .82$.

Communication self-efficacy—Communication self-efficacy was measured using three items developed de novo for this study which assessed three domains of communication competence: knowledge, motivation, and skills (Hargie, 2006). Participants rated items on a 1 (*strongly agree*) through 6 (*strongly disagree*) Likert scale. Items included: "I have a good understanding of the important things to say to my family members about cancer risk", "I am motivated to talk to my family members about cancer risk.", and "I have the skills to

communicate effectively with my family members about cancer risk.” Higher scores indicate greater communication self-efficacy. The measure demonstrated good internal consistency for this study, $\alpha = .77$.

Family health history communication—Three outcomes assessed family communication about cancer risk: (1) gathering information, (2) sharing information, and (3) frequency of communication.

Two dichotomous items (yes/no) assessed whether participants gathered and/or shared cancer history information with relatives (Yoon, Scheuner, Gwinn, & Khoury, 2004). The questions asked: “Have you ever actively collected cancer information from your relatives for the purpose of creating a family health history?” (gathering) and “Have you ever actively given your relatives information about hereditary cancer risk?” (sharing). If participants responded affirmatively they were then asked to report what type of information was gathered or shared, respectively (i.e., type of cancer, age of diagnosis, result of genetic test, and other).

Frequency of communication was assessed by asking participants: “How much have you spoken about family history of cancer with each of the following family members?” (Bowen, Bourcier, Press, Lewis, & Burke, 2004). Communication with each participant’s living first- and second-degree relatives was rated on a 4-point Likert scale, from 1 (*not at all*) to 4 (*a lot*). The average response over all living relatives was calculated and utilized in analyses.

Data Analyses

Descriptive statistics were calculated (Table 2). A log transformation on the frequency of communication variable was performed as it was positively skewed and kurtotic. No other data transformations were needed. Bivariate Pearson and point-biserial correlations and hierarchical logistic regressions examined relations among family context and family communication about the family health history of cancer. Demographic variables that were significantly related to the variables of interest were included in multivariate analyses (i.e., age, education, race, and family history of cancer (correlations not shown)). All analyses were performed using IBM SPSS 22 statistical software, and evaluated using $p < .05$ criterion level.

Results

Seventy-five percent ($N = 355$) of women reported having a cancer family history. Nineteen percent of women reported actively gathering family cancer history information, while 11% of women reported actively sharing cancer risk information with relatives (Table 2). Of those participants who reported gathering cancer information ($n = 88$), the majority reported collecting information on the type of cancer (91%) followed by their relative’s age of diagnosis (49%). For those women who shared information ($n = 51$) about cancer risk, 65% reported sharing specific information about familial cancer risk and 55% shared cancer prevention recommendations.

Bivariate Analysis

Women who perceived their families to be more cohesive and flexible were more likely to report communicating more frequently about the family cancer history as well as more likely to share cancer risk information with relatives (Table 3). However, no association was found between cohesion and flexibility and gathering family health history information from relatives. Findings revealed significant associations between self-efficacy and family cancer history communication. Women who reported greater perceived self-efficacy were more likely to have gathered family health history, shared cancer risk information with other relatives, and communicated more frequently with relatives regarding cancer. Furthermore, a higher sense of self-efficacy was significantly related to greater family cohesion and flexibility. Openness was not associated with communication or self-efficacy but was positively associated with family cohesion and flexibility.

Multivariate Analyses

Multiple logistic regressions, adjusting for age, education, race, and family history of cancer, were performed to examine whether family context significantly predicted family cancer history communication. Notably, adjusting for personal cancer history ($n = 18$) did not alter the results. We first examined significant predictors of gathering family health history information (Table 4). When family context and individual factors (openness, family organization and self-efficacy) were entered into a logistic regression adjusting for demographic factors, the omnibus model for *gathering* cancer information from relatives was significant, $\chi^2(8, N = 472) = 39.37, p < .01$. The Hosmer and Lemeshow test provided evidence that our model had adequate fit, $\chi^2(8, N = 472) = 0.65, p = 1.00$. In brief, results revealed that women with a higher sense of self-efficacy specific to cancer communication were more likely to gather family cancer history, $OR = 1.25, 95\% CI [1.12, 1.40]$. In addition, women with a family history of cancer were five times more likely to report gathering family cancer history information from relatives than women who did not have such history, $OR = 5.03, 95\% CI [1.71, 14.77]$.

Next, a hierarchical logistic regression adjusting for key demographic variables was performed with sharing cancer risk information as the outcome variable (Table 5). The omnibus model for *sharing* cancer risk information with relatives was significant, $\chi^2(8, N = 472) = 29.77, p < .01$. The Hosmer and Lemeshow test provided further evidence that the model was adequate, $\chi^2(8, N = 472) = 6.58, p = .58$. Self-efficacy emerged as a significant predictor of sharing cancer risk information. That is, women with a higher sense of self-efficacy to communicate about cancer risk were significantly more likely to share or provide cancer information ($OR = 1.19, 95\% CI [1.04, 1.38]$). Women who were older ($OR = 1.05, 95\% CI [1.02, 1.08]$) were also more likely to share cancer risk information to relatives.

Lastly, we conducted a hierarchical linear regression adjusting for age, education, race, and family history of cancer to examine whether family context and self-efficacy predicted frequency of communication about cancer with other relatives (Table 6). Perceived self-efficacy to communicate about cancer risk ($\beta = .27, p < .001$) and family cohesion ($\beta = .20, p = .006$) significantly predicted communication frequency.

Discussion

Family health history is an important cancer prevention and health promotion tool given that its assessment allows determination of an individual's inherited cancer risk (Valdez et al., 2010; Yoon et al., 2002; Yoon et al., 2004). To date, much of the literature on family history discussions about cancer have focused on patient-physician communication (Smith et al., 2011; Dickerson et al., 2012; Bell et al., 2015), communication among relatives of cancer survivors (Harris et al., 2010; Hay et al., 2009; Laws et al., 2009), and discussions surrounding genetic test results (Aktan-Collan et al., 2011; Bradbury et al., 2012; McCann, et al., 2009; Vos et al., 2011). Fewer studies have sought to identify family context or individual factors that may promote family health history discussions, yet this type of information could be used to identify families who may need support in having these conversations.

Our results provide further evidence to support an association between family organization, particularly family cohesion, and family cancer history communication and extend Harris et al. (2010) findings to a more diverse group of women. In this study, greater cohesion and flexibility within the family were associated with both sharing cancer risk information with relatives and with more frequent family communication about cancer. Contrary to expectations, cohesion and flexibility levels within the family were not associated with the act of gathering family cancer history. In multivariate analyses, cohesion was only predictive of frequency of family communication about cancer. These findings highlight the importance of family cohesion when considering cancer risk communication and suggest that more research is needed to understand the influence of the family system on family history communication particularly the mechanisms of action and the generalizability of these patterns. For instance, as individuals get older family organization may be more relevant to having family health history discussions because greater cohesion and flexibility has the potential to enable important social resources (Ashida et al., 2011). Our study consisted of mainly younger women whom may not be aware of the importance of family history nor be interested in mobilizing social resources to cope with an increased familial cancer risk. It may be that family organization is an important factor for older generations when it comes to cancer risk communication but is less so for younger individuals.

Despite a significant association between levels of cohesion and flexibility within the family and communication openness, results showed that openness was not associated with family cancer history discussions. It may be that openness to communicate in general, as measured in the present study, does not fully capture the complexity and challenges that may arise when communicating with family members about cancer risk. Moreover, it is possible that even when high levels of openness to discuss health problems in the family are reported cancer risk communication is avoided to minimize negative arousal or distress. For example, research has shown that communication about cancer-specific genetic test results can negatively impact families by increasing cancer-related distress (van Oostrom et al. 2007a; van Oostrom et al., 2007b). Furthermore, Kenen, Arden-Jones, and Eeles (2004) found that women with a BRCA mutation could identify at least one relative whom they could go to for support and openly discuss their genetic cancer risk, however, they recognized times when openly communicating about the family cancer risk may bring about negative consequences,

and therefore, reported limiting communication to minimize harm or distress. Measuring cancer-specific communication openness and identifying relatives that are open to discussing cancer risk information can help inform interventions that aim to increase family health history discussions.

When considering the family context, it is also important to examine individual factors that are hypothesized to impact health communication within families. Self-efficacy has been vastly studied in the health behavior change literature and is one factor that may be important to consider in cancer risk communication research. Social cognitive theory (Bandura, 1977) and the Health Belief Model (Rosenstock, Stretcher, & Becker, 1988) posit that greater self-efficacy, among other factors, is needed in order to engage in health promoting behaviors. In this study, perceived self-efficacy was a robust predictor of family cancer history communication. In fact, self-efficacy was related to all three communication outcomes in multivariate analyses. Women who reported a higher sense of self-efficacy to communicate cancer risk were more likely to also report gathering family cancer history information, sharing cancer risk information, and having more frequent cancer risk conversations with relatives. As such, our results contribute to the existing literature linking self-efficacy to health communication (Ashida, Goodman, Stafford, Lachance, & Kaphingst, 2012; Ashida & Schafer, 2015), and extends it to discussions specific to cancer among general population women. Future research may incorporate more recent theoretical perspectives on information seeking such as the theory of motivated information management (TMIM; Afifi & Weiner, 2004). In brief, TMIM describes a three-step process by which individuals engage in decision-making about seeking relevant information. Communication self-efficacy is regarded as an important factor in this process, and emerges as a significant target for intervention (Rauscher & Hesse, 2014; Hovick, 2014).

Multivariate analyses indicated that women who reported being aware of a positive family history of cancer were five times more likely to report actively gathering (not sharing) cancer history information from relatives than women without a family history of cancer. Intuitively, one would think that the same motivators found in the collection of cancer history are involved in the desire to share this knowledge with others in the family. However, it may be that the process of gathering information differs from the process of sharing cancer risk information with relatives. It is possible that sharing information about cancer risk is linked to a sense of responsibility for initiating family history conversations and passing this information along to others. This sense of responsibility may result from older generations having an increased familiarity with the family health history and being in the best position to pass down this information (Ashida et al. 2013). Gathering information, on the other hand, may require hearing the information from other sources and then asking follow-up questions to obtain the most accurate and up-to-date family history information. For instance, Dickerson, Smith, Sosa, McKyer, and Ory (2012) found that when given cues from friends and acquaintances, college-aged women were more likely to believe that they (not their physicians) were responsible for initiating family health history discussions. It may be that hearing about the family health history of others in their social network sparks interest in one's family resulting in the active collection of such information. Thus, there may be different factors associated with gathering and sharing cancer risk information depending on the perceived responsibility for initiating conversations about the family health history. More

research is needed to tease apart the mechanisms involved in these two types of communication processes.

Implications & Future Research

Utilizing a family systems approach, future research could utilize information about a family's organizational structure to develop tailored communication strategies that attempt to minimize adverse reactions when discussing family health history information (Harris et al., 2010). Our findings suggest that family cohesion, in particular, is an important factor when it comes to how often family members discuss family health history. While intervening on the family organization to enhance cohesion and flexibility may be one way to improve family health history discussions, it can also be a challenging and costly endeavor. Therefore, strategies that include targeting health messages for a particular family organization profile and providing specific communication skills training are likely to be more profitable. For example, highlighting the costs and benefits associated with health history communication for the entire system in a family with moderate levels of cohesion and flexibility may be an acceptable way to increase uptake of such important discussions; yet, said strategy may not be as effective for families with less cohesive and flexible structures. As such, future work should consider the role of family organization when developing health history communication messages.

Our results indicate that individuals are more likely to engage in family health history discussions about cancer when they feel confident in their abilities to do so and equipped with the right information. From a public health perspective, educational messages and campaigns to improve family health history awareness and communication may fall short if they do not target the individual's sense of self-efficacy. Skill-building programs that train individual family members to not only ask relevant questions regarding their cancer history but also provide instruction on how to best communicate with relatives have the best chance of success. A potentially useful approach communication researchers may consider is motivational interviewing (MI; Miller & Rollnick, 1991). MI is a patient-centered, collaborative approach which aims to enhance self-efficacy to perform a determined behavior while attempting to minimize resistance. Several intervention studies have successfully used MI in the adoption of screening behaviors for colorectal cancer screening and mammography screening (Costanza et al., 2009; Lowery et al., 2012; Menon et al., 2011; Wahab, Menon, & Szalcha, 2008). MI may be equally effective in promoting family cancer risk communication and encouraging screening, particularly for individuals who are ambivalent and/or lack self-efficacy to engage in health history communication. Educational interventions that include an MI component can help families openly explore, in a non-judgmental manner, concerns about familial cancer risk and their ambivalence over following screening recommendations.

As previously stated, family health history communication is an important tool for cancer prevention, yet significantly missing are interventions that aim to improve family communication about cancer history, and that are practical for clinical settings. Given the importance of family health history in prompting early (and more frequent) cancer screening for families at increased risk, it is important that future research translate lessons learned

into pragmatic interventions that will bring awareness of risk factors and encourage life-saving conversations within family members. Studies that examine the translational effect of talking about the family health history to actual practice of preventive behaviors including changing diet, increasing physical activity, and following recommended screening guidelines for personal risk level will be of utmost value to the existing literature. Thus, preventive interventions that target the whole family as a system, where family communication is encouraged, objective risk information is disseminated, communication skills are provided, and a risk-reducing action plan is established will be most successful (O'Leary et al., 2011; Williams, Mullan, & Todem, 2009).

Limitations

The present study is not without limitations. From a family systems perspective, optimal family communication is theorized to generate a more cohesive and flexible family environment (Olson & Gorra, 2006). As a cross-sectional study, however, we are unable to determine causality and conclude that such pattern exists. Our findings did show an association between cohesion and communication which warrants further exploration. The present study relied on self-report and, as such, may have been influenced by aspects of measurement wording as well as social desirability. Different item wording which minimizes the face validity of the measures used is warranted in future studies to control for this type of bias. Our study also focused exclusively on women's perspectives regarding family cancer history discussions. Thus, results are not generalizable to men. Future research is needed to determine whether family health history discussions and the factors that promote or hinder such discussions vary by gender. Lastly, this study is strengthened by the use of a large sample that was ethnically and socioeconomically diverse, however, was relatively young. Given findings that family health history discussions about cancer are likely to be initiated and carried out by older members of the family, it is likely that associations between family context and cancer risk communication may differ in a sample that focuses exclusively on older individuals.

Conclusions

Research evidence has provided a clear message: awareness of family cancer history has important implications for prevention and health promotion (Niededeppe, Frosch, & Hornik, 2008; Wiseman, Dancyger, & Michie, 2010). The presence of familial cancer syndromes and the clinical relevance of tailored cancer screening based on family health history suggest that communication about the family cancer history is particularly useful as it may promote cancer prevention strategies as well as early detection practices (Guttmacher, Collins & Carmona, 2004; Yoon et al., 2002; Yoon et al., 2009). In general, findings showcase the importance of family cohesion and communication self-efficacy in family cancer history communication and proposes important avenues for future research that address the need to recognize the family context, particularly family cohesion and communication self-efficacy, as a target for intervention.

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References

- Afifi WA, Weiner JL. Toward a theory of motivated information management. *Communication Theory*. 2004; 14(2):167–190.10.1111/j.1468-2885.2004.tb00310.x
- Ashida S, Goodman MS, Stafford J, Lachance C, Kaphingst KA. Perceived familiarity with and importance of family health history among a medically underserved population. *Journal of Community Genetics*. 2012; 3(4):285–295.10.1007/s12687-012-0097-x [PubMed: 22569765]
- Ashida S, Hadley DW, Goergen AF, Skapinsky KF, Devlin HC, Koehly LM. The importance of older family members in providing social resources and promoting cancer screening in families with a hereditary cancer syndrome. *The Gerontologist*. 2011; 51:833–842.10.1093/geront/gnr049 [PubMed: 21562055]
- Ashida S, Kaphingst KA, Goodman M, Schafer EJ. Family health history communication networks of older adults: Importance of social relationships and disease perceptions. *Health Education & Behavior*. 2013; 40(5):612–619.10.1177/1090198112473110 [PubMed: 23345335]
- Ashida S, Schafer EJ. Family health information sharing among older adults: Reaching more family members. *Journal of Community Genetics*. 2015; 6(1):17–27.10.1007/s12687-014-0197-x [PubMed: 25074679]
- Atkan-Collan K, Kaariainen HA, Koltola EM, Pylvanainen K, Jarvinen H, Pekka Mecklin J. Sharing genetic risk with next generation: Mutation-positive parents' communication with their offspring in Lynch Syndrome. *Familial Cancer*. 2011; 10:43–50.10.1007/s10689-010-9386-x [PubMed: 20857224]
- Bandura A. Self-Efficacy - toward a Unifying Theory of Behavioral Change. *Psychological Review*. 1977; 84(2):191–215.10.1037//0033-295x.84.2.191 [PubMed: 847061]
- Bandura A. Health promotion by social cognitive means. *Health Education & Behavior*. 2004; 31(2): 143–164.10.1177/1090198104263660 [PubMed: 15090118]
- Bell RA, McDermott H, Fancher TL, Green MJ, Day FC, Wilkes MS. Impact of a randomized controlled educational trial to improve physician practice behaviors around screening for inherited breast cancer. *Journal of General Internal Medicine*. 2015; 30(3):334–341.10.1007/s11606-014-3113-5 [PubMed: 25451990]
- Bodurtha JN, McClish D, Gyure M, Corona R, Krist AH, Rodriguez VM, ... Quillin JM. The KinFact Intervention - A Randomized Controlled Trial to Increase Family Communication About Cancer History. *Journal of Women's Health*. 2014; 23(10):806–816.10.1089/jwh.2014.4754
- Bowen DJ, Bourcier E, Press N, Lewis FM, Burke W. Effects of individual and family functioning on interest in genetic testing. *Community Genetics*. 2004; 7(1):25–32.10.1159/000080301 [PubMed: 15475668]
- Bowen, M. Theory in the practice of psychotherapy. In: Guerin, PJ., editor. *Family therapy*. New York: Gardner; 1976.
- Campbell T, Dunt D, Fitzgerald JL, Gordon I. The impact of patient narratives on self-efficacy and self-care in Australians with type 2 diabetes: stage 1 results of a randomized trial. *Health Promotion International*. 2013.10.1093/heapro/dat058
- Claes E, Evers-Kiebooms G, Boogaerts A, Decruyenaere M, Denayer L, Legius E. Communication with close and distant relatives in the context of genetic testing for hereditary breast and ovarian cancer in cancer patients. *American Journal of Medical Genetics*. 2003; 116:11–19.10.1002/ajmg.a.10868 [PubMed: 12476445]
- Costanza ME, Luckmann R, White MJ, Rosal MC, LaPelle M, Cranos C. Moving mammogram-reluctant women to screening: A pilot study. *Annals of Behavioral Medicine*. 2009; 37:343–349.10.1007/s12160-009-9107-6 [PubMed: 19517203]
- Dikerson JB, Smith ML, Sosa E, McKyer E, Ory MG. Perceived responsibility to initiate family health history discussions among college women associated with individuals diagnosed with heart disease. *Primary Health Care: Open Access*. 2012; 2:1–5.10.4172/phcoa.1000109

- Ersig AL, Williams JK, Hadley DW, Koehly LM. Communication, encouragement, and cancer screening in families with and without mutations for hereditary nonpolyposis colorectal cancer: A pilot study. *Genetics in Medicine*. 2009; 11:728–734.10.1097/GIM.0b013e3181b3f42d [PubMed: 19707152]
- Falzon C, Radel R, Cantor A, d'Arripe-Longueville F. Understanding narrative effects in physical activity promotion: the influence of breast cancer survivor testimony on exercise beliefs, self-efficacy, and intention in breast cancer patients. *Supportive Care in Cancer*. 2014 Advance online publication. 10.1007/s00520-014-2422-x
- Foster C, Eeles R, Arden-Jones A, Moynihan C, Watson M. Juggling roles and expectations: Dilemmas faces by women talking to relatives about cancer and genetic testing. *Psychology & Health*. 2004; 19:439–455.10.1080/08870440410001684168
- Guttmacher AE, Collins FS, Carmona RH. The family history--more important than ever. *New England Journal of Medicine*. 2004; 351(22):2333–2336.10.1056/NEJMs042979 [PubMed: 15564550]
- Haggstrom DA, Shapiro MM. Black-White differences in risk perceptions of breast cancer survival and screening mammography benefit. *Journal of General Internal Medicine*. 2006; 21:371–377.10.1111/J.1525-1497.2006.00347.x [PubMed: 16686816]
- Hargie, O. *Handbook of Communication Skills*. 3. New York: Routledge; 2006.
- Harris JN, Hay J, Kuniyuki A, Asgari MM, Press N, Bowen DJ. Using a family systems approach to investigate cancer risk communication within melanoma families. *Psycho-Oncology*. 2010; 19:1102–1111.10.1002/pon.1667 [PubMed: 20119933]
- Hay J, Shuk E, Zapolska J, Ostroff J, Lischewski J, Brady MS, Berwick M. Family communication patterns after melanoma diagnosis. *Journal of Family Communication*. 2009; 9:209–232.10.1080/15267430903182678
- Hovick SR. Understanding family health information seeking: A test of the theory of motivated information management. *Journal of Health Communication*. 2014; 19(1):6–23.10.1080/10810730.2013.778369 [PubMed: 24117214]
- Hovick SR, Yamasaki JS, Burton-Chase AM, Peterson SK. Patterns of family health history communication among older African American adults. *Journal of Health Communication*. 2015; 20(1):80–87.10.1080/10810730.2014.908984 [PubMed: 25174859]
- Julian-Reynier C, Eisinger F, Chabal F, Lasset C, Nogues C, Stoppa-Lyonnet D, ... Sobol H. Disclosure to the family of breast/ovarian cancer genetic test results: Patient's willingness and associated factors. *American Journal of Medical Genetics*. 2005; 94:13–18. [PubMed: 10982476]
- Kaphingst KA, Goodman M, Pandya C, Garg P, Stafford J, Lachance C. Factors affecting frequency of communication about family health history with family members and doctors in a medically underserved population. *Patient Education & Counseling*. 2012; 88(2):291–297.10.1016/j.pec.2011.11.013 [PubMed: 22197261]
- Kenen R, Arden-Jones A, Eeles R. We are talking, but are they listening? Communication patterns in families with a history of breast/ovarian cancer (HBCO). *Psycho-Oncology*. 2004; 13:335–345.10.1002/pon.745 [PubMed: 15133774]
- Kinney AY, Gammon A, Coxworth J, Simonsen SE, Arce-Laretta M. Exploring attitudes, beliefs, and communication preferences of Latino community members regarding BRCA1/2 mutation testing and preventive strategies. *Genetics in Medicine*. 2010; 12:105–115.10.1097/GIM.0b013e3181c9af2d [PubMed: 20061960]
- Koehly LM, Peters JA, Kenen R, Hoskins LM, Ersig AL, Kuhn NR, ... Greene MH. Characteristics of health information gatherers, disseminators, and blockers within families at risk of hereditary cancer: Implications for family health communication interventions. *American Journal of Public Health*. 2009; 99:2203–2209.10.2105/AJPH.2008.154096 [PubMed: 19833996]
- Lawsin C, DuHamel K, Itzkowitz S, Brown K, Lim H, Jandorf L. An examination of the psychosocial factors influencing colorectal cancer patients' communication of colorectal cancer patient risk with their siblings. *Cancer Epidemiology, Biomarkers & Prevention*. 2009; 18:2907–2912.10.1158/1055-9965.EPI-07-2558

- Lemon SC, Zapka JQ, Clemow L. Health behavior change among women with recent familial diagnosis of breast cancer. *Preventive Medicine*. 2004; 39:253–262.10.1016/j.ypmed.2004.03.039 [PubMed: 15226033]
- McCann S, MacAuley D, Barnett Y, Buntig B, Bradley A, Jeffers L, Morrison PJ. Family communication, genetic testing and colonoscopy screening in hereditary non-polyposis colon cancer: A qualitative study. *Psycho-Oncology*. 2009; 18:1208–1215.10.1002/pon.1487 [PubMed: 19177338]
- Menon U, Belue R, Wahab S, Rugen K, Kinney AY, Maramaldi P, Wujek D, Szalacha LA. A randomized trial comparing the effect of two phone-based interventions on colorectal cancer screening adherence. *Annals of Behavioral Medicine*. 2011; 42:294–303.10.1007/s12160-011-9291-z [PubMed: 21826576]
- Mesters I, van den Borne H, McCormick L, Pruyn J, de Boer M, Imbos T. Openness to discuss cancer in the nuclear family: Scale, development, and validation. *Psychosomatic Medicine*. 1997; 59:269–279. [PubMed: 9178338]
- Miller, WR.; Rollnick, S. *Motivational interviewing: Preparing people to change addictive behavior*. New York: Guilford Press; 1991.
- Niededepp J, Frosch DL, Hornik RC. Cancer news coverage and information seeking. *Journal of Health Communication*. 2008; 13:181–199.10.1080/10810730701854110 [PubMed: 18300068]
- Nycum G, Avar D, Knoppers BM. Factors influencing intrafamilial communication of hereditary breast and ovarian cancer genetic information. *European Journal of Human Genetics*. 2009; 17:872–880.10.1038/ejhg.2009.33 [PubMed: 19319160]
- O'Leary J, Edelson V, Gardner N, ... Bowen D. Community-centered family health history: A customized approach to increased health communication and awareness. *Progress in Community Health Partnerships: Research, Education, and Action*. 2011; 5(2):113–122.
- Olson DH. Circumplex model of marital and family systems. *Journal of Family Therapy*. 2000; 22:144–167.10.1111/1467-6427.00144
- Olson D. FACES-IV and the Circumplex model: Validation study. *Journal of Marital and Family Therapy*. 2011; 37:64–80.10.1111/j.1752-0606.2009.00175.x [PubMed: 21198689]
- Olson, DH.; Gorrall, DM. *FACES IV Manual*. Minneapolis, MN: Life Innovations; 2006. *FACES IV and the Circumplex Model*.
- Olson, DH.; Gorrall, DM.; Tiesel, JW. *Manual for FACES-IV*. Minneapolis, MN: Life Innovations; 2007. *FACES IV & the circumplex model: Validation study*.
- Peterson SK. The role of the family in genetic testing: Theoretical perspectives, current knowledge, and future directions. *Health Education & Behavior*. 2005; 32:627–639.10.1177/1090198105278751 [PubMed: 16148209]
- Rauscher EA, Hesse C. Investigating uncertainty and emotions in conversations about family health history: A test of the theory of motivated information management. *Journal of Health Communication*. 2014; 19(8):939–954.10.1080/10810730.2013.837558 [PubMed: 24479771]
- Rosenstock IM, Strecher VJ, Becker MH. Social-Learning Theory and the Health Belief Model. *Health Education Quarterly*. 1988; 15(2):175–183.10.1177/109019818801500203 [PubMed: 3378902]
- Rubinstein WS, Acheson LS, O'Neill SM, Ruffin MTt, Wang C, Beaumont JL, Rothrock N. Clinical utility of family history for cancer screening and referral in primary care: a report from the Family Healthcare Impact Trial. *Genetics in Medicine*. 2011; 13(11):956–965.10.1097/GIM.0b013e3182241d88 [PubMed: 22075527]
- Smith ML, Sosa ET, Hochhalter AK, Covin J, Ory MG, McKyer ELJ. Correlates of family health history discussions between college students and physicians: Does family cancer history make a difference? *Journal of Primary Prevention*. 2011; 32:311–322. [PubMed: 21818648]
- Valdez R, Yoon PW, Qureshi N, Fisk Green R, Khouri MJ. Family history in public health practice: A genomic tool for disease prevention and health promotion. *Annual Review of Public Health*. 2010; 31:69–87.10.1146/annurev.publhealth.012809.103621
- Van Oostrom I, Meijers-Heijboer H, Duivenvoorden HJ, Brocker-Vriends AH, Van Asperen CJ, Sijmons RH, ... Tibben A. Family system characteristics and psychological adjustment to cancer

susceptibility genetic testing: A prospective study. *Clinical Genetics*. 2007a; 71:35–42.10.1111/j.1399-0004.2007.00731.x [PubMed: 17204044]

Van Oostrom I, Meijers-Heijboer H, Duivenvoorden HJ, Brocker-Vriends AH, Van Asperen CJ, Sijmons RH, ... Tibben A. A prospective study of the impact of genetic susceptibility testing for BRCA1/2 or HNPCC on family relationships. *Psycho-Oncology*. 2007b; 16:320–328.10.1002/pon.1062 [PubMed: 16909428]

Vos J, Jansen AM, Menko F, van Asperen CJ, Stiggelbout AM, Tibben A. Family communication matters: The impact of telling relatives about unclassified variants and uninformative DNA-test results. *Genetics in Medicine*. 2011; 13:333–341.10.1097/GIM.0b013e318204cfed [PubMed: 21358410]

Wahab S, Menon U, Szalacha L. Motivational interviewing and colorectal cancer screening: A peek from the inside out. *Patient Education and Counseling*. 2008; 72:201–217.10.106/j.pec.2008.03.023 [PubMed: 18440753]

Wang C, Sen A, Plegue M, Ruffin MT, O'Neill SM, Rubinstein WS, Acheson LS. Impact of family history assessment on communication with family members and health care providers: A report from the Family Healthware Impact Trial (FHITr). *Preventive Medicine*. 2015 Advance online publication. 10.1016/j.ypmed.2015.04.007

Williams KP, Mullan PB, Todem D. Moving from theory to practice: implementing the KinKeeper Cancer Prevention Model. *Health Education & Research*. 2009; 24:343–356.10.1093/her/cyn026

Wiseman M, Dancyger C, Michie S. Communicating genetic risk information within families: A review. *Familial Cancer*. 2010; 9:691–703.10.1007/s10689-010-9380-3 [PubMed: 20852947]

Yamasaki J, Hovick SR. “That was grown folks’ business”: Narrative reflection and response in older adults’ family health history communication. *Health Communication*. 2015; 30(3):221–230.10.1080/10410236.2013.837569 [PubMed: 24580636]

Yoon PW, Scheuner MT, Gwinn M, Khoury MJ. Awareness of family health history as a risk factor for disease -- United States, 2004. *Morbidity and Mortality Weekly Report*. 2004; 53:1044–1047. [PubMed: 15538320]

Yoon PW, Scheuner MT, Jorgensen C, Khoury MJ. Developing Family Healthware: A family history screening tool to prevent common chronic diseases. *Preventing Chronic Disease*. 2009; 6(1):A33. [PubMed: 19080039]

Yoon PW, Scheuner MT, Peterson-Oehlke KL, Gwinn M, Faucett A, Khouri MJ. Can family history be used as a tool for public health and preventive medicine? *Genetics in Medicine*. 2002; 4:304–301. [PubMed: 12172397]

Table 1

Sample Characteristics (N = 472)

	n	%
Ethnicity		
Hispanic	16	3.4
Not Hispanic	456	96.6
Race ^a		
Black	279	59.4
White	157	33.4
Other	34	7.2
Marital Status		
Married	192	40.6
Single	225	47.7
Other	55	11.7
Living Arrangements ^b		
Partner/Husband	179	38
Alone	136	28.9
Friends or Other relatives	62	13.2
Other	94	19.9
Education ^c		
Graduated high school/GED or less	190	48.4
Some college, vocational or trade school	83	21.1
Graduated college or higher	120	30.5
Health Insurance		
Commercial	130	27.6
Managed care	197	41.7
No insurance	145	30.7
Family History of Cancer		
No	117	24.8
Yes	355	75.2
Age		
Mean (<i>SD</i>)	33.71 (<i>12.00</i>)	

Note.

^aTwo participants did not provide information on their race.

^bOne participant failed to indicate her living arrangements.

^cSeventy-nine participants were not asked about their education level.

Table 2

Descriptive Statistics

	Mean (SD)	Min	Max	N
Communication Openness	17.65 (3.88)	6	24	472
Family Cohesion	1.88 (0.84)	0.30	4.86	472
Family Flexibility	1.56 (0.56)	0.30	3.76	472
Self-efficacy	13.08 (3.11)	3	18	472
Frequency of Communication	1.48 (0.54)	1	4	471
	<i>n</i>		%	
Gathering FHH Information				
No	384		81.4	
Yes	88		18.6	
- Type of cancer	80		91	
- Age of diagnosis	43		49	
- Results of genetic testing	8		9.1	
- Other	9		10.2	
Sharing FHH Information				
No	421		89.2	
Yes	51		10.8	
- Medical information about cancer	25		49	
- Risk for cancer in the family	33		65	
- Recommendations for cancer prevention	28		55	
- Results of genetic testing	3		5.8	
- Other	1		1.9	

Note: Percentages for the type of information discussed were calculated by using the number of participants that reported 'yes' to gathering or sharing FHH information as the denominator. As a result, these percentages do not add up to 100.

Table 3

Pearson & Point-Biserial Correlations

	1	2	3	4	5	6	7
1. Communication Openness	–						
2. Family Cohesion	.485**	–					
3. Family Flexibility	.455**	.762**	–				
4. Self-Efficacy	.071	.189**	.223**	–			
5. Communication Frequency	.042	.242**	.162**	.317**	–		
6. Gathering FHH [†]	–.026	.054	.016	.223**	.408**	–	
7. Sharing FHH [†]	–.017	.096*	.104*	.160**	.322**	.307**	–

Note.

**
 $p < .01$;*
 $p < .05$;

[†] Gathering FHH and Sharing FHH were coded 0 (No) and 1 (Yes); therefore, the coefficient reported is the point-biserial correlation coefficient r_{pb} . For all continuous variables, the Pearson correlation coefficient r is reported.

Table 4
Logistic Regression: Family Context Predicting Gathering Family Health History Information

	B	SE	Wald $\chi^2(1)$	OR	95% CI	p
Control Variables						
Age	0.01	0.01	0.73	1.01	[0.99, 1.03]	.394
Education Level	0.11	0.10	1.29	1.11	[0.93, 1.34]	.256
Family History of Cancer	1.62	0.55	8.63	5.03	[1.71, 14.77]	.003
Race	−0.05	0.34	0.02	0.95	[0.49, 1.84]	.886
Family Context						
Communication Openness	−0.00	0.05	0.01	1.00	[0.91, 1.09]	.933
Family Cohesion	0.15	0.29	0.25	1.16	[0.66, 2.03]	.615
Family Flexibility	−0.29	0.43	0.44	0.75	[0.33, 1.74]	.506
Self-efficacy	0.22	0.06	15.80	1.25	[1.12, 1.40]	.000

Table 5
Logistic Regression: Family Context Predicting Sharing Cancer Risk Information with Relatives

	B	SE	Wald χ^2 (1)	OR	95% CI	p
Control Variables						
Age	0.05	0.01	11.08	1.05	[1.02, 1.08]	.001
Education Level	0.10	0.12	0.71	1.10	[0.88, 1.39]	.400
Family History of Cancer	0.81	0.57	2.01	2.25	[0.73, 6.86]	.156
Race	-0.62	0.44	2.01	0.54	[0.23, 1.27]	.156
Family Context						
Communication Openness	-0.02	0.06	0.12	0.98	[0.88, 1.09]	.726
Family Cohesion	0.12	0.34	0.12	1.12	[0.58, 2.17]	.731
Family Flexibility	0.24	0.48	0.25	1.28	[0.49, 3.30]	.616
Self-efficacy	0.18	0.07	6.43	1.19	[1.04, 1.37]	.011

Table 6

Hierarchical Linear Regression: Family Context Predicting Communication Frequency

	R ²	β
Step 1	0.19 **	
Age		0.21 **
Education Level		0.18 **
Family History of Cancer		0.23 **
Race		0.06
Step 2	0.11 **	
Communication Openness		0.02
Family Cohesion		0.20 *
Family Flexibility		−0.04
Self-efficacy		0.27 **
Total R ²	0.30 **	

Note.

*
 $p < .05$;**
 $p < .01$.