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Perceived Responsibility to Initiate Family Health History Discussions among College Women Associated with Individuals Diagnosed with Heart Disease

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Abstract

Objectives: To examine young women's perceived responsibility for initiating family health history discussion with their primary care providers when associated with individuals with heart disease.

Methods: Data were obtained from an internet-based survey administered to 232 young women enrolled at a large university. Exploratory factor analysis and structural equation modeling were used to relate these women's health beliefs to their perceived responsibility for initiating family health history discussion with their physicians.

Results: Heart disease self-risk factors were positively related (β = 0.21, p = 0.005) to the physician being responsible for initiating family health history discussion. Motivation from friends and acquaintances to obtain family health history was positively related (β = -0.17, p = 0.022) to the woman being responsible for initiating family health history discussion.

Conclusion: Friends and social networks play an important role in how young women perceive their responsibility for initiating family health history discussion with their primary care providers.

Keywords: Heart disease; Patient-physician interaction; Family health history; Social networking

Introduction

Heart disease is the leading cause of death in the United States, with total costs of the disease in excess of $300 billion annually [1]. Although it is the leading cause of death among American women [2] and in 2006 killed 15% more women than all types of cancer combined [2,3] cancer continues to be perceived by women as a more common cause of death than heart disease [4]. This incongruence between beliefs and mortality statistics is most pronounced among younger women [4]. Although age-adjusted rates of coronary heart disease mortality in the United States have fallen significantly in the past few decades, annual percentage changes in mortality among younger women are actually increasing [5].

Several studies [6,7] illustrate the importance of family history in the development of coronary heart disease; however, younger women often exhibit less knowledge and awareness of cardiovascular disease risk factors in general compared to men of the same age [8]. Evidence suggests that younger women with a family history of premature myocardial infarction have lower awareness of cardiovascular risk factors and worse lifestyle choices compared to similarly aged men [9].

The role of patient-physician discussions about family history of coronary heart disease has been deemed critical given the incidence rate among women [10]. The purpose of our study is to examine the factors that influence who American college women perceive is responsible (i.e., patient or physician) for initiating family health history discussions. Our study is unique because it examines factors that motivate younger women to take responsibility for family health history discussions with their physicians, or alternatively, why they relegate such responsibility for these discussions to their physicians. The implications of our study for clinical practice improvement are substantial.

Methods

The "Finding Roots: Exploring Your Family History" study [11] investigated college students' knowledge, perceptions and behaviors with regards to obtaining their family health history, including history of chronic diseases (i.e., cancer, heart disease, diabetes, obesity, HIV/AIDS and cystic fibrosis). Mixed methodology was utilized to integrate qualitative and quantitative components for instrument development. The survey instrument consisted of 60 items; included Likert-type scales, checklists and close-ended response formats; was disseminated using electronic mail-based recruitment; and took participants approximately fifteen minutes to complete. A total of 703 students voluntarily responded to the Internet-based survey, with the option to discontinue their participation at any time. This study was approved by the Texas A&M University Institutional Review Board. Sixty percent (n = 422) of survey respondents were women.

Our study focused on female respondents without heart disease who reported associations to individuals diagnosed with heart disease. Types of individuals with heart disease who were associated with the respondent included: a parent, grandparent, sibling, aunt, uncle, cousin, friend, friend's family member, classmate, or co-worker. This

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selection criterion was used to include women who most likely knew about heart disease. This resulted in a sample of 232 college women with an association to individuals with heart disease.

The dependent variable selected for analysis was one item that asked participants to identify whose responsibility it was to initiate family health history discussions in the patient- physician relationship (i.e., the college student or the physician). The 1-10 scale represented a spectrum of perceived responsibility from complete college student responsibility (i.e., a score of 1) to complete physician responsibility (i.e., a score of 10). The dependent variable was normally distributed.

Based on our literature review, we identified 36 observed variables in our instrument most applicable to our research question. Exploratory factor analysis was used to identify common factors among these variables. Principal Axis Factoring was used for variable extraction and Varimax with Kaiser Normalization was used as the rotation method [12]. Missing data was very limited in the sample (i.e., less than 1%). Kaiser-Myer-Olkin and Bartlett's sphericity tests were used to see whether the data met established criteria to perform factor analysis [13]. Based on prior analysis [14], an Eigenvalue of at least 1 was used to extract variables and a coefficient of at least .40 was used to load a variable on a factor [13]. Variables loading on more than one factor were excluded. Cronbach's alpha was used to test the internal reliability of scales. A coefficient of .70 was set for this purpose [15,16]. Analyses were performed with IBM SPSS Statistics version 18 [17,18]. The exploratory factor analysis resulted in six unique heart disease and family health history factors (Table 1).

The factors were analyzed within a structural equation model using IBM AMOS version 18 [17]. The factors served as independent variables in the model, while the perceived patient or physician responsibility to initiate family health history discussions served as the dependent variable. Prior research indicates such a sample of our size (i.e., n = 232) can produce statistically significant results in a structural equation model context [19].

The modeling process started with an evaluation of all six factors, in addition to the following independent variables: age, sex, ethnicity, education level of parents, whether the respondent had a regular family physician and the type of person diagnosed with heart disease associated with the respondent. Maximum likelihood estimation was used to calculate model estimates. Model paths were considered significant at the $\alpha = 0.05$ level. As iterations of the model were considered, insignificant factors and variables were removed, resulting in a final model for analysis.

Several fit metrics were used to determine the final structural equation model. CMIN/df (i.e., chi-square statistic divided by the

Construct	Observed Variables	Factor Coefficients	Cronbach's Alpha	Score Range	Analytic Sample
Heart Disease Self-Risk Factors	*I would most likely develop heart disease due to:* Behavioral causes Genetic Causes Environmental Causes	 0.89 0.85 0.59	0.749	0 - 30	21.41 (± 5.82)
Heart Disease Severity – Physical Vitality	*Heart disease would be detrimental to my:* My quality of life is impacted My physical well-being is impacted My sexual encounters are impacted	 0.89 0.85 0.74	0.730	0 - 30	16.36 (± 3.13)
Heart Disease Severity – Mental Vitality	*Heart disease would be detrimental to my:* My mental well-being is impacted My social life is impacted My emotional well-being is impacted My spiritual well-being is impacted My academic performance is impacted	 0.83 0.83 0.90 0.78 0.81	0.878	0 - 30	24.86 (± 6.50)
Cues to Obtain Family Health History – Immediate Family	*I would be motivated to obtain my family health history if:* I'm diagnosed I develop symptoms My sibling is diagnosed My biological parent is diagnosed	 0.85 0.85 0.78 0.74	0.804	0 - 4	3.67 (± 0.87)
Cues to Obtain Family Health History – Friends/Acquaintances	*I would be motivated to obtain my family health history if:* A friend is diagnosed A friend's family member is diagnosed Someone I know has symptoms	 0.87 0.82 0.81	0.786	0 - 3	1.80 (± 1.22)
Cues to Obtain Family Health History – Education	*I would be motivated to obtain my family health history if:* Learned about genetic risk factors – Non-educational source Learned about health condition risk factors – Non-educational source Learned about genetic risk factors - Educational source Learned about health condition risk factors – Educational source A friend tells me family health history is important A family member says family health history is important	 0.85 0.80 0.78 0.75 0.73 0.70	0.859	0 - 6	3.34 (± 2.23)

Table 1: Heart Disease and Family Health History Constructs.

model degrees of freedom) was used to measure the fit of the model to the data. Acceptable values are considered to be as close to 1 as possible [20]. TLI (i.e., Tucker-Lewis index) values approaching 1; and CFI (i.e., confirmatory fit index) values of greater than 0.95 were utilized to test the model to baseline comparisons based on established guidelines [20-24]. TLI reduces model fit as insignificant parameters are added to the model. CFI plays a similar role by evaluating the correlation of parameters in the model to ensure factor validity. Finally, RMSEA (i.e., root mean squared error of approximation) was used to approximate model error. A value of less than 0.05 was used based on established guidelines [20].

Results

Table 2 illustrates differences between females in the analytic sample and those who did not meet our inclusion criteria. It also provides a summary of the analytic sample's personal characteristics. The analytic sample was more likely than the females omitted from the study to have a regular family physician ($\beta = 6.49$, $p = 0.011$). This was the only statistically significant difference to the females omitted from our study. However, a Pearson correlation test indicated no relationship ($\beta = -0.029$, $p = 0.565$) between having a family physician and the dependent variable (responsibility to initiate discussion of family health history with a physician). As such, there is no bias from the sample participants being more likely to have a family physician than the females omitted from the study. The analytic sample was also comprised primarily of non-Hispanic whites, 20-24 years old, who mostly came from well educated families.

After evaluating iterations of the model, we determined two factors had a statistically significant relationship to the dependent variable. This resulted in a final model (Figure 1) that best predicted changes in perceived patient-physician responsibility for initiating family health history discussions based on factors concerning perceived importance of heart disease self-risk factors ($\beta = 0.21$, $p = 0.005$) and factors based on cues from friends and acquaintances to obtain family health history ($\beta = -0.17$, $p = 0.022$). For each unit increase of heart disease self-risk factors, the perceived responsibility for initiating family health history discussions shifted toward the physician. For each unit increase of cues from friends and acquaintances to obtain family health history, the perceived responsibility for initiating family health history discussions shifted toward the patient (i.e., the college student).

The overall model fit statistics from this final model confirmed the importance of these factors' influence on the dependent variable. The CMIN/df was1.481 indicating strong overall model fit to the data set. The measures of parameter correlation and significance were also strong (i.e., TLI = 0.966 and CFI = 0.984). Finally, the RMSEA of 0.046 indicates a model that adequately minimizes error.

Discussion

The relationship between heart disease self-risk factors and responsibility for initiating family health history discussions was not expected. Intuitively, we expected that as perception of risk factor importance was increased, the perceived responsibility of discussing family health history would lie with the patient (i.e., the college student) because of their knowledge of the importance of these risk factors. However, further examination of the literature may provide an explanation for this seemingly paradoxical relationship.

		Analytic Sample (N = 232)	Female Respondents Not in sample (N = 190)	All Female Respondents (N = 422)	X^2	P
Age	18	22(9.5%)	15(7.9%)	37(8.8%)	6.65	0.466
	19	43(18.5%)	32(16.8%)	75(17.8%)		
	20	68(29.3%)	67(35.3%)	135(32.0%)		
	21-24	89(38.4%)	64(33.7%)	153(36.3%)		
	25+	10(4.3%)	12(4.3%)	22(5.2%)		
Regular Family Physician	Yes	188(81.0%)	117(61.6%)	305(72.3%)	6.49	0.011
	No	44(19.0%)	50(26.3%)	94(22.3%)		
	Missing	0(0.0%)	23(12.1%)	24(5.4%)		
Ethnicity	White	182(78.4%)	136(71.6%)	317(75.4%)	16.35	0.129
	African-American	8(3.4%)	10(5.3%)	18(4.3%)		
	Asian	12(5.2%)	14(7.4%)	26(6.2%)		
	Hispanic	15(6.5%)	25(13.2%)	42(9.5%)		
	American-Indian	7(3.0%)	1(0.5%)	8(1.9%)		
	Other	4(1.7%)	3(1.6%)	7(1.7%)		
	Multi-Ethnic	4(1.7%)	1(0.5%)	5(1.2%)		
Education of the Father	<8th Grade Education	4(1.7%)	3(1.6%)	7(1.7%)	5.25	0.629
	Some High School	6(2.6%)	3(1.6%)	9(2.1%)		
	Completed High School	30(12.9%)	31(16.3%)	61(14.5%)		
	Some College	48(20.6%)	36(18.9%)	84(19.9%)		
	Completed College	79(33.9%)	58(30.5%)	137(32.5%)		
	Some Graduate School	7(3.0%)	7(3.7%)	14(3.3%)		
	Completed Graduate School	55(23.6%)	37(19.5%)	92(21.8%)		
	Don't know or Not Applicable	3(1.3%)	7(3.7%)	10(2.4%)		
	Missing	0(0.0%)	8(4.2%)	8(1.9%)		
Education of the Mother	<8th Grade Education	3(1.3%)	2(1.1%)	5(1.2%)	12.82	0.077
	Some High School	8(3.4%)	3(1.6%)	11(2.6%)		
	Completed High School	28(12.1%)	36(18.9%)	64(15.2%)		
	Some College	62(26.7%)	53(27.9%)	115(27.3%)		
	Completed College	85(36.6%)	56(29.5%)	141(33.4%)		
	Some Graduate School	10(4.3%)	5(2.6%)	15(3.6%)		
	Completed Graduate School	36(15.5%)	23(12.1%)	59(14.0%)		
	Don't know or Not Applicable	0(0.0%)	4(2.1%)	4(0.9%)		
	Missing	0(0.0%)	8(4.2%)	8(1.9%)		

Table 2: Personal Characteristic Comparisons between Analytic Sample and Omitted Female Respondents.

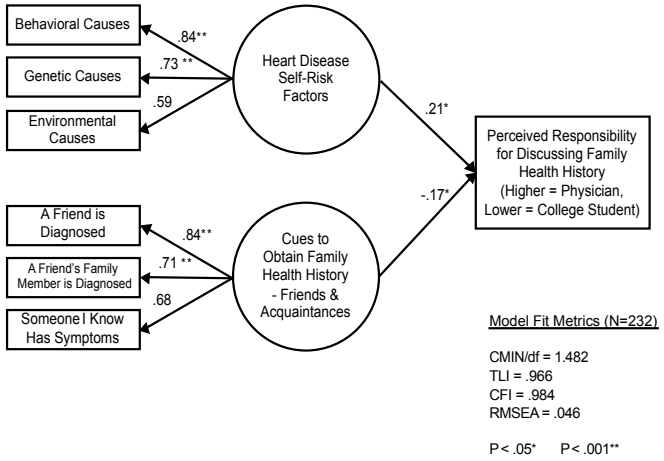

Figure 1: Structural Equation Model of Heart Disease and Family Health History Constructs of College Women with an Association to Individuals with Heart Disease

As demonstrated in Table 1, the most significant component of this factor was self-risk assessment of the behavioral causes of heart disease. Based on studies examining the positive self-risk assessments of children with parents who suffered premature coronary heart disease [25], it is possible these college women viewed their own behaviors as better than those in their family lineage. Hunt et al. [26] found that among 23-year-olds with a perceived family history of heart disease, nearly 50% reported they were unlikely to get heart disease. This same group believed that if heart disease ran in their family, it was very important for them to exercise [26]. This belief was more pronounced among 23-year-olds in the study than among the 43-year-old and 63-year-old groups, respectively [26]. Believing the risk of heart disease can be controlled with healthier behavioral choices than those engaged in by their relatives may be a strongly held view among younger people and the participants in this study.

It should be noted that genetic causes of heart disease was also closely related to the overall heart disease self-risk factor. If respondent's self-risk assessment of genetic causes of heart disease was noteworthy, it begs the question why these respondents ascribed more responsibility to their physicians to initiate family health history discussions. One possible explanation comes from a study by Hastrup et al. [27] indicating how the accuracy of cardiovascular family history among younger people begins to deteriorate as they move beyond their parent's generation. This could suggest younger people don't know enough about their family health histories to fully appreciate genetic risk factors, even though they recognize their importance. This is similar to the findings of Weiner et al. [28] that examined the beliefs of people with a family history of hypercholesterolemia and coronary heart disease and discovered that genetic factors were considered important, but not absolute.

This study makes a noteworthy finding about the influence of friends and acquaintances in motivating college women to obtain their family health history and take responsibility for initiating family health history discussions with their physician. To our knowledge, this is the first time such a finding has been made among college women.

Montgomery et al. [29] found that among other diseases, women perceive a higher level of risk for heart disease when a friend is diagnosed. This finding was unique to women [29]. It is striking to see the apparent vicarious association played by friends of college women in comparison to family and educational resources. The current generation of young women is likely the most socially connected in history. With a social fabric connected through technological mediums such as the internet and associated social networking applications, it is intuitively realistic to believe friends play a significant role in the lives of college women. Our finding of the enhanced responsibility for discussing family health history given a diagnosed friend or acquaintance may speak to this new era of connectivity between social networks. The instantaneous communication of negative circumstances of one member of the network could produce a "shock" factor among the other network members which induces self-motivation. This is supposition based on the findings of our study, but it does speak to the need for further investigation of the role social networks play in determining how involved college women become in their management of family health history.

Limitations

There are several strengths of our study. First, we had access to a large and diverse sample. Second, our study is among the first to investigate the issue of responsibility for initiating family health history discussions with physicians among college women, a population becoming more important to the epidemiological issue of heart disease in women [5]. Finally, our study is unique in its inclusion of diverse groups of individuals beyond immediate family members, such as friends and acquaintances. This appears to be of significance in the new age of social networking and its implications for health promotion.

Our study also has limitations. The survey population was from a single college campus which may or may not be representative of the attitudes of college women across the country. Second, our study did not focus on lifestyle behaviors of the respondents (e.g., diet, physical activity and smoking). A better understanding of such behaviors would help validate some of the responses in the survey. Finally, family health history as a concept is one that is not universally defined [30]. Among younger people, it is possible that results were influenced by differing interpretations of the phrase, "family health history."

Conclusion

As heart disease continues to be a major public health issue among American women there will continue to be opportunities to address prevention topics at earlier stages of life. Our study illustrates that for college women to take more responsibility for obtaining and discussing family health history, educational and clinical efforts must focus on addressing the perception of college women's lifestyle and behavioral choices relative to those in their family history. Also, understanding the unique role of friends in the lives of college women may open an avenue in motivating them to take more responsibility for discussing their family health history with their physician.

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