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Innovative Approaches to Reducing Cancer Health Disparities: The Moffitt Cancer Center Patient Navigator Research Program

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Abstract

The Moffitt Cancer Center Patient Navigation Research Program (Moffitt PNRP) is evaluating the efficacy of patient navigation in reducing delays from screening abnormality to diagnostic resolution of a breast or colorectal abnormality. The Moffitt PNRP was conducted in three phases: (1) developing an acceptable, appealing, and culturally appropriate patient navigation program; (2) conducting a group randomized controlled trial to evaluate the patient navigation program; and (3) disseminating research findings and Moffitt PNRP intervention model. The patient navigation program was developed through significant formative research, input from the Moffitt PNRP Community Advisory Board, and through a close collaboration with the Tampa Bay Community Cancer Network. 1367 patients are enrolled in the Phase 2 group randomized trial of the Moffitt PNRP. Most Moffitt PNRP group randomized trial participants are Hispanic, female, and Spanish speaking, with minimal education and income. The intervention is being disseminated in primary care clinics in west central Florida.

Introduction

While survival rates for breast and colorectal cancer have increased, certain populations, such as ethnic and racial minorities, people who lack health insurance, and people with lower socioeconomic status, continue to have lower rates of survival compared to Caucasians, people with health insurance, and people at higher socioeconomic status. Ethnic and racial minority and other medically underserved patients are more likely to be diagnosed

at advanced stages for many cancers[1-6] and are more likely to experience delays in cancer diagnosis and treatment.[7-10] Meta-analytic research indicates that delays between onset of breast cancer symptoms and start of treatment that are as short as 3 to 6 months can significantly reduce survival;[11] however, the evidence linking delays in diagnosis or treatment of colorectal cancer with mortality, survival, or cancer stage at diagnosis is less clear.[12, 13]

Patient navigation is a strategy designed to reduce delays in accessing cancer care services from screening through diagnosis and treatment. PN focuses on identifying and resolving barriers to increase the number of patients who receive recommended follow-up care. [14-16] PN was originally designed to assist medically underserved populations in following through with recommendations for diagnostic and treatment services following a cancer abnormality or diagnosis of cancer.[17]

Several descriptive- and outcome-based studies of PN programs have been conducted to evaluate PN interventions designed to improve outcomes for breast cancer. Initial studies indicate PN is a promising intervention associated with improvements in rate of breast cancer screening,[18] reducing delays and improving adherence to breast cancer diagnostic care,[19-23, 17, 24] reducing late-stage breast cancer,[25-31] improving survival for breast cancer,[25-30] reducing delays in breast cancer treatment,[32] and improving treatment adherence.[33] Furthermore, there is moderate support for the usefulness of PN programs focused on improving access to diagnostic care for women who experience screening abnormalities.[19-23, 17, 24] However, other research indicates that PN is not associated with improvements in breast cancer treatment outcomes.[33]

Some research indicates that PN alone, or in combination with other services, improved rates of completed colonoscopies.[34, 35] Three sources reported results of two RCTs comparing PN with usual care in completion of colonoscopy for primarily low income and minority patients.[34, 36, 37] In one small sample, patients referred for screening colonoscopy who received PN had a higher completion rate for colonoscopy than patients who received usual care, but the result was not statistically significant.[37, 36] One RCT found that over a nine-month period of time, participants overdue for colorectal cancer screening and randomized to receive PN services were more likely to receive screening than participants who received usual care.[38, 39]

Previous studies of the effect of PN to reduce barriers to breast and colorectal cancer care show promise for improving outcomes. However, many early studies of PN have significant limitations, including a lack of RCTs, small samples sizes, and combining PN with additional interventions that may have also affected outcomes, such as increased outreach. [27, 17, 25, 26, 28, 29, 37, 35, 20, 21, 40-42, 24] The Patient Navigation Research Program (PNRP) is a 5-year multisite clinical trial designed to overcome some of the limitations in initial research on PN through the use of well-designed RCTs with adequate sample sizes, standardized patient navigator training, and rigorous data collection. The PNRP evaluates the efficacy and cost-effectiveness of PN, using several different patient navigator models. [16]

The Moffitt Cancer Center Patient Navigation Program (Moffitt PNRP) is one of eight sites funded by the National Cancer Institute's (NCI's) Center to Reduce Cancer Health Disparities (CRCHD) to evaluate the use of PN in reducing delays to diagnosis and treatment of four cancers. A ninth PNRP site is funded by the American Cancer Society (ACS). Through a formal committee structure, the PNRP has utilized a standard definition of PN: "support and guidance offered to vulnerable persons with abnormal cancer screening or a cancer diagnosis, with the goal of overcoming barriers to timely, quality care." [16] All

PNRP programs begin navigation with a symptom requiring diagnostic evaluation or a screening abnormality indicating cancer and end navigation with the diagnostic resolution of the screening abnormality, or, if a patient is diagnosed with cancer, the conclusion of treatment of that cancer. All PNRP programs collect data using common metrics based on published guidelines or consensus of the PNRP steering committee.[16]

The Moffitt PNRP was conducted in three phases: (1) developing an acceptable, appealing, and appropriate patient navigator program; (2) conducting a group randomized controlled trial (GRT) to evaluate the patient navigator program; and (3) disseminating the findings from this research and the Moffitt PNRP intervention model. The goals of the present paper are to: (1) describe the Moffitt PNRP designed to reduce health care complexities; (2) examine baseline characteristics of participants in the GRT; and (3) identify local challenges the project has encountered and solutions to those challenges.

Overview of the Moffitt PNRP

Phase 1—Development of the Moffitt Cancer Center Patient Navigation Research Project

Overview—The development of an acceptable, appealing, and appropriate patient navigator program was guided through three activities: (1) feedback from the Moffitt PNRP Community Advisory Board (CAB); (2) the ongoing collaborative relationship with the Tampa Bay Community Cancer Network (TBCCN); and (3) formative research. The goal of the Moffitt PNRP is to decrease barriers to obtaining diagnostic and treatment services for primary care patients experiencing a screening abnormality or symptom requiring diagnostic follow-up for breast or colorectal cancer.

Community Advisory Board—The Moffitt PNRP initiative is guided by a CAB established during project conceptualization. This dynamic oversight group includes representatives of local hospitals, community clinics, the affiliate offices of ACS, cancer support groups, Moffitt Cancer Center personnel, the Hillsborough County School System, Florida congressional representatives, a representative from a managed care organization, local health care providers, and a faith-based community health promotion organization. In the initial stages of program development, CAB members provided information about resources available to patients in the community. In addition, the CAB has raised awareness of the Moffitt PNRP among local and national stakeholders. The CAB has met yearly to provide guidance on the implementation and dissemination of the Moffitt PNRP intervention.

Tampa Bay Community Cancer Network—The Moffitt PNRP enjoys a close collaborative relationship with the Tampa Bay Community Cancer Network (TBCCN), a Community Network Program also funded by NCI's CRCHD (Dr. Cathy Meade, Principal Investigator, U01CA114627).[43] TBCCN aims to address critical access, prevention, and control issues that impact medically underserved, low-literacy, and low-income populations in selected areas of Hillsborough, Pinellas, and Pasco counties in Florida. The TBCCN network draws on the strengths of existing community-academic partnerships and has provided considerable expertise to the Moffitt PNRP in providing innovative culturally and literacy-relevant education to PN program recipients. In addition, TBCCN community partners provided significant educational resources to patients served by the Moffitt PNRP intervention.

Formative Research—Focus groups were used to determine key Moffitt PNRP intervention components from a local perspective. The primary goal of the focus groups was to obtain information to design a culturally sensitive, literacy appropriate, and socially

relevant PN program that could be implemented at community-based primary care centers. Two focus groups were conducted with women who had received a diagnosis of cancer or a cancer screening abnormality. One focus group included women who spoke English, and the second focus group included women who spoke Spanish. Focus group participants provided information about cultural experiences and values that influenced the women's cancer health care decision making. In addition, the women described barriers that they encountered, which included communication barriers, insurance and financial barriers, and a lack of trust of health care providers. The focus groups provided information about patients' experiences when accessing the health care system for cancer care, provided insights about relevant content domains for inclusion in the PN training program, and examined pertinent community issues in development of the PN model.

Patient Navigation Model—The Moffitt PNRP PN model was created by adhering to a principle of providing culturally competent services described by Meleis.[44] After consideration of local needs and resources, the Moffitt PNRP adopted a lay patient navigator model. The lay patient navigator model was selected because local conditions in the Tampa Bay area required navigators to conduct multiple home and health care provider visits. In addition, through feedback from the Moffitt PNRP CAB, the participating primary care clinics, and formative research, it was determined that Moffitt PNRP patient navigators should be lay members of communities served to build trust, and to meet literacy, communication, and cultural needs of patients in the project.

To this end, four full-time and one part-time lay patient navigators provide PN services in the Moffitt PNRP. Four patient navigators are Spanish-English bilingual, reflecting the significant linguistic needs of the communities served in the Moffitt PNRP. The patient navigators received both initial training and continuing education. The initial training included a two-day session conducted by the PNRP training committee in collaboration with the ACS.[45] Ongoing training sessions were provided by the PNRP training committee, both in person and through webinars. Patient navigators also received substantial training in issues related to PN at the local level. This training focused on diagnostic and treatment experiences for the two cancers of interest; communication with low literacy patients; translation and interpretation; boundaries and self disclosure; medical terminology; completing financial paperwork; and hospice services. In addition, Moffitt PNRP patient navigators spent significant time becoming familiar with resources available in the communities and health systems in which patients obtained services. The patient navigators obtained expertise in the health systems by meeting health care providers and staff at the referral clinics, diagnostic clinics, and hospitals and clinics where patients receive cancer treatment. Moffitt PNRP patient navigators obtained information about community resources through networking and personal visits to supporting organizations. Personnel with whom all navigators interacted (i.e., financial department, translation services) were invited to attend weekly navigation supervision meetings. Following the initial training period, all Moffitt PNRP patient navigators received ongoing weekly individual and group supervision from the project manager and a registered nurse who served as the patient navigator clinical supervisor. The Moffitt PNRP clinical supervisor also conducted biannual observations of the patient navigators as they delivered PN services to ensure adherence to the PN intervention protocol.

Moffitt PNRP patient navigators spent considerable time providing education to patients and their families regarding breast or colorectal cancer. Prior to the initiation of the intervention, a review of existing educational resources was conducted. Through the guidance of the clinical supervisor and project leadership, materials were selected based on their appropriateness for the patients' literacy levels, cultural values, and language preference. When existing material were not sufficient, the materials were adapted or new

materials (such as instructions for a colonoscopy preparation) were created. Educational information was provided using a number of different media and approaches, such as orally and through the use of videos and brochures in the patients' and family members' preferred language. The educational sessions took place as needed in patients' homes, workplaces, and in the clinic settings where patients were obtaining cancer diagnostic or treatment care. Often, education was provided at the time of the clinical encounter so that patients and their families would be well informed of the procedures and the results of the procedures.

Phase 2—Evaluating the Impact of the Moffitt Patient Navigator Research Project

Overview—A GRT with a nested cohort design was conducted to evaluate the efficacy of PN as delivered in the Moffitt PNRP. The primary outcomes for the study are (1) receipt of diagnostic resolution of a screening abnormality; and (2) the time interval (in days) between the abnormal finding suspicious for breast or colorectal cancer and resolution of the abnormality. Phase 2 of the Moffitt PNRP is evaluating the following study hypotheses: (1) Were patients who received PN for a screening abnormality more likely to obtain diagnostic resolution of the abnormality than patients who received usual care? and (2) Was PN associated with a reduction in time from screening abnormality to diagnostic resolution of a breast or colorectal cancer screening abnormality? All research procedures were approved by the University of South Florida Institutional Review Board.

Randomization of Primary Care Clinics—As previously described, Phase 2 of the project was a GRT with a nested cohort design. The unit of randomization is the primary care clinic from which patients were referred to the study. Prior to patient recruitment, participating clinics were randomized by the study biostatistician to receive either PN or usual care with delayed PN (control) using a computer program. Neither patients nor clinics were blinded to study group. Participants recruited from clinics randomized to the control group did not receive services of a patient navigator, but may have been provided assistance with coordinating cancer diagnostic and treatment care by the primary care clinic staff. Data were collected on patients who were receiving care at control clinics at the same time as patients who received PN at intervention clinics (years 2 through 4) to evaluate study hypotheses. The clinics randomized to the control condition were provided PN starting in year five of the project (Phase 3). Patients who received care at clinics randomized to PN were provided services of a patient navigator in addition to usual medical care. The participating primary care clinics (Table 1) provide care to medically underserved patients over a seventy mile area that includes four counties located in urban and rural areas of west central Florida: Hillsborough, Manatee, Pasco, and Pinellas. Ten of the referring sites are federally qualified health centers, and two are hospital-based primary care clinics.

Inclusion and Exclusion Criteria—Participants were eligible for Phase 2 of the Moffitt PNRP if they (1) received health care at one of 12 participating primary care clinics; (2) were 18 years of age; (3) experienced an abnormality suspicious for breast or colorectal cancer or were recently diagnosed with breast or colorectal cancer. Patients were excluded from the Moffitt PNRP if they: (1) were diagnosed with any other type of cancer, except non-melanoma skin cancer, within the past 5 years; (2) had started treatment for breast or colorectal cancer prior to study enrollment; or (3) had previously been navigated. Breast-related abnormalities include abnormal or incomplete screening tests (mammography [BIRADS 0, 3, 4, 5], screening breast examination). Patients having symptoms potentially related to breast cancer (abnormality noted on self-exam, breast pain, nipple discharge) were also eligible if there were corresponding suspicious findings on clinical examination warranting referral.[16] Conditions meeting eligibility criteria for a colon abnormality include abnormal rectal exam performed by clinician (rectal mass, stool positive for blood)

and abnormalities noted on colorectal cancer screening tests (fecal occult blood testing, sigmoidoscopy, colonoscopy, barium enema).[16]

Recruitment—Potential participants were referred to the Moffitt PNRP from one of 12 participating primary care clinics if they experienced a breast or colorectal cancer screening abnormality or symptom. For patients in clinics receiving PN, health care providers at participating clinics completed a standardized referral form that was collected each week by patient navigators or faxed to PN program offices. Patient navigators called each potential participant and met face-to-face to explain the PN intervention, obtained informed consent, and assessed his or her needs and assets in obtaining recommended health care. The navigators then started the navigation process by working with community-based health and social-service organizations to act on the identified barriers to diagnosis or cancer treatment. To accomplish these tasks, navigators utilized several communication approaches, including but not limited to: home visits; visits at community-based organizations, clinics, and hospitals; phone calls; letters; faxes; and interactions with the patients' health care providers. Control participants were referred to the program from participating control clinics through a combination of methods, including provider referrals, billing data, and logs of medical procedures.

Data Collection and Management—Using established guidelines and recommendations for chart abstracting [46, 47] and adhering to HIPAA approved methods, trained medical record abstractors reviewed all parts of primary care and comprehensive cancer center medical records, including the flow sheet, progress notes, laboratory reports, and records from other providers. All medical record abstractors received substantial training and were instructed to review medical records according to a data dictionary developed by the PNRP. Medical record data collection was enhanced through standardized data collection forms. All participants who provided informed consent to participate were asked demographic questions in person using a standardized data collection form available in English or Spanish. After collection, data were entered into an Excel spreadsheet or Access database by a research assistant. A data manager screened data for out of range variables or logical errors in data collection.

Data Analysis—Analysis of the main study hypotheses will follow analytic principles for GRTs. Even though the study is a cohort design where the patients were followed over time, the primary endpoint is only one time point measurement (at the event date). We will use a general linear random effects model to test the intervention effect on the outcome variable (time from screening abnormality to resolution of the suspicious finding), while adjusting for the intra-correlation coefficient. Several covariates, such as age and socioeconomic status, will be included in the model as confounding factors.

Prior to study implementation, a power analysis was conducted to determine the sample size needed to test the hypothesis evaluating the impact of PN on time from screening abnormality to diagnostic resolution of the abnormality. A shortening of 5 days was deemed to be a significant difference, based on the recommendation from the PNRP data analysis team. We assumed the standard deviation as a range of 10 to 12 days. We determined the required sample size is 70 patients per clinic to detect this difference with 2.5% significance (two-tailed test) and 80% power.

Baseline Characteristics of Phase 2 Moffitt PNRP Participants—Medical records were reviewed for a total of 1367 participants, and patient demographic surveys were completed by 739 participants (Table 2). Of these participants, 638 received navigation and 729 were recruited from control clinics. Most participants were Hispanic (57.7%), white

(84.1%), and female (93.5%) with a mean age of 45.7 years [Standard Deviation (SD): 13.1 years]. Forty-eight percent of participants were married or living with a partner. Forty-nine percent of participants had documentation in their medical record of some type of private or public health insurance. Most participants were referred for a breast cancer abnormality or symptom requiring further diagnostic evaluation. Among participants who completed demographic surveys, the mean level of education was 9.1 years (SD: 4.1 years). Participants reported having an average of 3.2 (SD: 2.0) people living in their household. Moffitt PNRP participants came from many diverse backgrounds, including 30 different countries of origin. The most frequently reported countries of origin were Mexico (41.5% of participants) and the United States (38.3% of participants). In total, Moffitt PNRP participants reported speaking a total of 14 different languages. The majority of participants reported speaking either Spanish (62.6%) or English (34.5%) as their primary language. Most participants reported annual household incomes of less than \$20,000, with 11.6% indicating their household had no annual income.

Phase 3—Dissemination of the Moffitt Cancer Center Patient Navigation Intervention

The last project year is devoted to disseminating the PN model developed and tested in Phases 1 and 2 to the broader Tampa Bay community, as well as disseminating research results. Phase 3 is currently underway, and the PN intervention is now being provided to seven primary care clinics, including 2 that did not receive PN in Phase 2.

Project Challenges and Solutions

Throughout the five-year Moffitt PNRP project, there were several local challenges that required creative solutions.

Recruitment

The Moffitt PNRP experienced barriers to recruitment. In Phase 1, the project faced difficulties recruiting participants for formative research. The project was able to successfully complete the two focus groups with Spanish- and English-speaking women, but was not able to successfully recruit enough males to complete the other two planned focus groups. Future formative research with this population should utilize more flexible research designs, such as individual in-depth interviews, reduce barriers to recruitment by allowing more flexibility in the research design, and also partner with organizations that serve a large proportion of medically underserved men to increase recruitment of medically underserved men.[48, 49]

In Phase 2, there were difficulties recruiting both navigation and control participants to the study. Initially, all control patients were recruited and consented to participate in the project individually in person by a research assistant. This process was time consuming and hampered participant recruitment as few patients could be contacted due to migration or lack of a viable telephone number. In addition, due to the large geographic area covered by the project, research assistants spent considerable time traveling to obtain informed consent from control patients. To address the difficulty of recruiting control participants, HIPAA and informed consent waivers were obtained from the institutional review board to enable the project team to conduct retrospective chart-reviews of concurrent control participants without having to consent patients.

In the early stages of Phase 2, certain clinics consistently referred patients to the study whereas other clinics referred few patients or referred patients inconsistently. As recruitment was problematic in several PNRP sites, efforts were made to assess the other PNRP sites to share best practices for recruitment. Based on these discussions, the Moffitt PNRP staff worked diligently to continually enhance relationships with clinics. In addition, the decision

was made to increase the number of participating clinics from the original number (7) to a total of 12 sites. Our success in recruiting additional primary care clinics was in part due to relationships built with community partners through TBCCN. Through these methods of increasing participant recruitment, the project was able to continue to use methods of identifying eligible subjects that were similar at both intervention and control sites.

Patient Navigation Intervention

Throughout the project there were challenges to the delivery of the PN intervention. One challenge faced by the Moffitt PNRP was providing comprehensive navigator training. Navigators were required to have a working knowledge of primary care clinic procedures, referral procedures, cancer diagnostic and treatment procedures, financial assistance programs, health insurance programs, social support services, medical interpretation, and transportation services. To meet training needs, the Moffitt PNRP patient navigators were provided national PN training[45] and also attended training sessions specific to the local conditions of the Moffitt PNRP. Also, ongoing training was provided as new issues arose in the provision of navigation services. One area in which the navigators required more information and support was when providing services to the 30 patients receiving treatment for cancer. The cancer patients had many emotional needs coupled with multiple or severe medical comorbidities. In such situations, other members of the team provided the navigators with extra support and guidance in the handling of complex cases.

Delivery of the actual navigation intervention in the communities served by the Moffitt PNRP required the use of an intensive navigation model, which consisted of frequent in-person interactions with patients and significant time spent providing cancer education. Many of the participants who received navigation services in the Moffitt PNRP belonged to migrant farmworker families and spent part of the year working in agricultural jobs located in rural areas of Florida. Since the patients were migratory, patient navigators had to work quickly to get patients recommended care before the patient moved to another location in the United States or internationally. In addition, navigation entailed frequent in-person contact at participants' houses, at primary care clinics, at diagnostic centers, and at treating hospitals. After intensive training Moffitt PNRP lay patient navigators were prepared to provide the navigation intervention using many different educational resources.

Data Collection

Throughout Phase 2, there were multiple barriers to data collection. Data collected for each enrolled Moffitt PNRP patient required at least one medical record abstraction from primary care, diagnostic, and treatment medical records located in multiple locations in the large geographic area served by the project. For many participants, it was hard to obtain data required by the PNRP program. Many primary care records lacked critical information, which necessitated multiple chart reviews at primary care clinics and reviews of other medical record sources. An additional hurdle to data collection was changes in each clinic's infrastructure or procedures that indirectly affected data medical record data abstraction. These changes included systematic changes in medical record numbers and transitioning from paper medical records to electronic medical records. Each change necessitated an adjustment in methods of data collection at that particular site.

Conclusion

The Moffitt PNRP has been conducted in three phases, in which a PN intervention was developed, tested for efficacy in a GRT, and then disseminated to additional primary care clinics. The development of the Moffitt PNRP PN intervention was facilitated by collaborative relationships with the Moffitt PNRP CAB and TBCCN, a Community

Network Program, also funded by CRCHD. There were a number of lessons learned during the Moffitt PNRP project that are applicable to other PN initiatives. First, it is important to implement PN interventions in health care systems in which a strong relationship is established with clinic and community partners. Second, implementing and evaluating a PN program requires significant resources, personnel, time, and flexibility to respond to frequent health care system changes. Third, it is important to have educational resources that are appropriate for the needs of a diverse, multicultural population.

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Table 1

Information about Moffitt PNRP Participating Primary Care Clinics.

Site	County	Location	Intervention or Control Group
Tampa General Family Care Center 30 th Street	Hillsborough	Urban	Intervention
Tampa General Family Care Center Kennedy	Hillsborough	Urban	Control
Plant City Family Care	Hillsborough	Rural	Intervention
Ruskin Health Center	Hillsborough	Rural	Intervention
Dover Health Center	Hillsborough	Rural	Control
Dade City Family, Dental, & Behavioral Health Center	Pasco	Rural	Intervention
Zephyrhills Family Health Center	Pasco	Rural	Control
Southeast Family Healthcare Center	Manatee	Rural	Intervention
North Manatee Family Health Center	Manatee	Rural	Control
Parrish Family Healthcare Center	Manatee	Rural	Intervention
Community Health Centers Pinellas Park	Pinellas	Urban	Intervention
Johnnie Ruth Clark Health Center	Pinellas	Urban	Control

Table 2

Demographic Characteristics of Moffitt Patient Navigator Research Program Phase 2 Participants

Participant Characteristics	Control N (% of Control)	Navigation N (% of Navigation)	Total N (% of Total)
Hispanic ethnicity (n = 1295)	302 (45.7)	444 (70.1)	746 (57.7)
Race			
White	546 (78.3)	569 (90.5)	1115/1326 (84.1)
Black	107 (15.4)	53 (8.4)	160/1325 (12.1)
Asian	23 (3.3)	5 (0.8)	28/1325 (2.1)
Native Hawaiian/Other Pacific Islander	1 (0.1)	0	1/1324 (0.1)
American Indian/Alaskan Native	1 (0.1)	3 (0.5)	4/1325 (0.3)
Other Race	6 (0.9)	0	6/1325 (0.5)
Marital Status (n = 1195)			
Single/Never Married	211 (33.4)	165 (29.3)	376 (31.5)
Married/Living with Partner	260 (41.2)	313 (55.5)	573 (47.9)
Divorced/Separated	113 (17.9)	68 (12.1)	181 (15.1)
Widowed	47 (7.4)	18 (3.2)	65 (5.4)
Health Insurance			
Medicare	90 (12.5)	23 (3.8)	113/1325 (8.5)
Medicaid	170 (23.6)	58 (9.6)	228/1325 (17.2)
Private Insurance	56 (7.8)	25 (4.1)	81/1325 (6.1)
Other government-sponsored health insurance	227 (31.6)	105 (17.4)	332/1324 (25.1)
Type of Abnormality or Cancer (n = 1366)			
Breast	595 (81.6)	536 (84.1)	1131 (82.8)
Colorectal	134 (18.4)	95 (9.9)	229 (16.8)
Both breast and colorectal	0	6 (0.9)	6 (0.4)
Referral Problem (n = 1363)			
Screening abnormality or symptom requiring further evaluation	719 (99.0)	621 (97.5)	1340 (98.3)
Cancer	6 (0.8)	13 (2.0)	19 (1.4)
Both cancer and screening abnormality or symptom in multiple sites of the body	1 (0.1)	3 (0.5)	4 (0.3)
Employment (n = 730) *			
Not employed	59 (60.8)	361 (57.0)	420 (57.5)
Employed part time	19 (19.6)	114 (18.0)	133 (18.2)
Employed full time	19 (19.6)	158 (25.0)	177 (24.2)
Housing Status (n = 709) *			
Rent home	49 (50.5)	322 (52.6)	371 (52.3)
Own home	35 (36.1)	184 (30.1)	219 (30.9)
Live with family or friends	13 (13.4)	88 (14.4)	101 (14.2)
Other	0	18 (2.9)	18 (2.5)

Participant Characteristics	Control N (% of Control)	Navigation N (% of Navigation)	Total N (% of Total)
Annual household income (n = 726) *			
No income	9 (9.2)	75 (11.9)	84 (11.6)
\$1 to \$9,999	33 (33.7)	180 (28.7)	213 (29.3)
\$10,000 to \$19,999	34 (34.7)	270 (43.0)	304 (41.9)
\$20,000 to \$29,999	15 (15.3)	80 (12.7)	95 (13.1)
\$30,000 to \$39,999	3 (3.1)	14 (2.2)	17 (2.3)
\$40,000 to \$49,999	2 (2.0)	7 (1.1)	9 (1.2)
\$50,000 to \$74,999	0	1 (0.2)	1 (0.1)
\$75,000 to \$99,999	0	1 (0.2)	1 (0.1)
\$100,000 or more	2 (0.3)	0	2 (0.3)

* Data collected through self-report survey