



Published in final edited form as:

Psychooncology. 2018 January ; 27(1): 132–140. doi:10.1002/pon.4387.

Determinants of Patient Activation in a Community Sample of Breast and Prostate Cancer Survivors

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Abstract

Background—Patient activation—the knowledge, skills and confidence to manage one's health—is associated with improved self-management behaviors for several chronic conditions. This study assesses rates of patient activation in breast and prostate cancer survivors and explores the characteristics associated with patient activation.

Methods—A cross-sectional study of survivors with localized (Stage I or II) breast and prostate cancers who are post-treatment (between 1–10+ years) were recruited from four community-hospital sites in New Jersey. Survey data on patient characteristics (demographic and psychosocial) and clinical factors were assessed to explore relationships with patient activation using the Patient Activation Measure (PAM-13).

Results—Among 325 survivors (112 prostate; 213 breast) overall patient activation was high ($M=3.25$). Activation was significantly lower among prostate survivors when compared to breast cancer survivors ($M=3.25$ [SD 0.38] vs. $M=3.34$ [SD 0.37], $p < 0.05$). For prostate survivors, race ($p < 0.05$), marital status ($p < 0.001$), employment status ($p < 0.01$), household income ($p < 0.05$), and fear of recurrence ($p < 0.01$) were significantly associated with patient activation. For both groups ease of access to oncology team and primary care physicians (PCPs) (all p -values < 0.001) and perceptions of time spent with oncologists team and PCPs (all P -values $< .01$) were positive predictors of activation.

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Conflict of Interest: None of the authors have any potential conflicts of interest to disclose.

Conclusions—In both breast and prostate survivors' access to providers (both PCPs and oncologists) and perception that adequate time spent with providers were associated with activation. Therefore, clinical interventions maybe a promising avenue to improve patient activation. Research is needed to develop and test tailored patient activation interventions to improve self-management among cancer survivors.

Introduction

Currently 14.5 million cancer survivors live in the U.S.; and the largest subpopulations of survivors are men with prostate cancer (43%) and women with breast cancer (41%) [1]. After cancer treatment, patients are expected to navigate a complex, fragmented healthcare system that is inexperienced at meeting their long-term needs [2]. Proposed models of long-term care for cancer survivors involves collaboration between oncologists and primary care providers (PCPs), with an eventual tapering off of oncology care after the early phases of follow-up care are completed [3, 4]. Cancer is now understood as a chronic condition that requires patient's self-management well beyond the end of acute treatment [5]. Self-management during survivorship includes follow-up with oncology team and PCPs at recommended intervals, awareness of symptoms of recurrence, adapting physically and emotionally symptoms and making necessary lifestyle adjustments to support recovery [5]. Chronic care models emphasize partnerships between healthcare providers and "informed, activated patients" for optimal patient outcomes [6, 7].

Patient activation is a modifiable characteristic, and refers to the level of motivation, knowledge, skills and confidence to manage one's own health [8, 9]. Increases in activation are associated with positive changes in general health and disease-specific self-management [10, 11]. As efforts to articulate best practices for cancer survivorship continue, patient activation may provide insights about a patient's capacity during this transition. Previous studies have shown that patient activation levels are related to preventive health screenings and lifestyle behaviors that are relevant to the cancer survivor population. Patients with higher activation are more likely to exercise, eat a healthy diet (low-fat and more fruits and vegetables), refrain from smoking, and engage in more consumeristic behaviors [9]. Additionally, highly activated patients are more likely to receive preventive cancer screenings, and have regular check-ups more frequently than less activated patients [11, 12]. In a study that surveyed six chronic disease populations across a large health system, patient activation was positively associated with self-management behaviors, use of self-management services and medication adherence [13]. Whereas, patients with lower levels of activation are more likely to report having unmet medical needs and to delay the receipt of necessary medical care [14].

There are no empirical studies of patient activation in early stage breast and prostate cancer patients. Though, patient activation has been shown to be associated with improved outcomes across conditions (i.e., diabetes, HIV, etc.) that require self-management and proactive care seeking [13–16]. Moreover, studies have shown that when activation increases, patients' health behaviors, clinical outcomes and health systems costs change in anticipated directions [8, 10, 11, 17–19]. Therefore, the purpose of this study is to assess

rates of patient activation in breast and prostate cancer survivors and to explore the characteristics associated with activation.

Methods

Study Participants

For this cross sectional exploratory design, early stage (I or II) breast and prostate cancer survivors (n=325) were enrolled in the study between May 2012 and June 2013. All participants received treatment at one of four community oncology hospitals that were members of the Rutgers Cancer Institute of New Jersey's network of affiliated hospitals. Sites were purposely chosen to represent the heterogeneity of the area's American College of Surgeons Commission on Cancer accredited community oncology cancer treatment centers, and patients were recruited from two comprehensive community and two academic comprehensive cancer programs. Inclusion criteria included: (1) stage I or II breast or prostate cancer diagnosis; (2) completed active treatment for cancer by the date of recruitment; and, (3) not currently undergoing treatment for an additional cancer.

Procedures

The Rutgers University Biomedical and Health Sciences Institutional Review Board approved this study (Approval # 0220080133). All participants provided written informed consent through a mailed consent process. Participants were identified using onsite patient registry or were approached by study staff at a follow-up visit. After consent was obtained, participants received a survey in the mail with a cover letter from the cancer treatment facility and the study investigator that explained the study. Non-responders were mailed reminder post cards and a final survey at two weeks and one month, respectively, after the initial mailing. The average response rate was 60%.

Measures

Each patient completed a mailed, written, self-reported survey upon enrollment that assessed patient characteristics, clinical factors, and patient activation. The outcome of interest was patient activation, measured by the 13-item Patient Activation Measure (PAM) [20], with a modified response scale. Our response scale included "uncertain" as its mid-point (i.e. strongly disagree, disagree, uncertain, agree, or strongly agree) compared to the original PAM scale which includes "not-applicable" displayed outside of the 4-point range (i.e. strongly disagree, disagree, agree, or strongly agree; NA). Our five-point response scale was converted to a four-point range (with five unique values with equal distance between them) so that scores would be consistent with the original response scale. Cronbach's alpha for PAM with the modified response scale was 0.89. Mean score across the 13 items was used as the composite score, with higher scores indicating higher levels of patient activation.

Standard demographics of age, race, marital status, employment and income were measured by self-report. Patients self-reported weight and height, was used to calculate Body Mass Index. The psychosocial variables consisted of two questions which assessed worry about the future and fear of cancer recurrence both measured on a 5-point Likert scale (1=almost never and 5=almost always). These single, stand-alone items for fear of disease recurrence

and worries about the future have been used widely in other studies [21]. Clinical factors included cancer site (i.e., breast or prostate cancer), time since first cancer diagnosis, primary or secondary diagnosis of cancer, time since treatment, and insurance status, which were single-items on the survey. Comorbidities were derived from the Charlson Comorbidity Index and grouped into two categories (e.g., 2–3 conditions or 3 or more) [22]. From a multiple response question, participants reported the types of doctors they used for cancer follow-up over the past two years (i.e., primary care, obstetrician/gynecologist [OB/GYN], cancer specialist, or urologist). Separate binary variables were created for PCP, OB/GYN (females only), and cancer specialist. Urologist was merged with cancer specialist for prostate participants. Additionally, subjects were asked which they considered to be an ideal cancer-related follow-up doctor from a list of PCP, cancer specialist/oncologist, or other.

Patients' perceptions of care items were separately assessed for PCPs and cancer-related clinicians. The first item assessed patients' perceptions of the ease of access to each provider. The other item assessed whether the patient felt the doctors spent enough time with them. Response choices included: disagree, uncertain, agree, or strongly agree with these statements. Disagreement and uncertainty were combined for the analysis.

Data Analysis

Demographic and health profile of the sample was presented overall and by cancer type with means and standard deviations (SDs) or frequencies and percentages depending on the measurement scale. Similarly, means and SDs for PAM scores were calculated by medical and demographic factors.

Analysis of Variance (ANOVA) was used to explore relationships of PAM with patient and clinical factors, as well as potentially modifiable factors (i.e., patient perception of care and psychosocial factors). Interactions between modifiable factors and variables containing distinct vulnerable populations were assessed using ANOVA as well, to show whether the association between these demographics or medical characteristics with patient activation differed across levels of modifiable factors. Means and SDs were calculated for each of these subgroups. An alpha level of 0.05 was used for assessment of statistical significance. All analyses were conducted using the statistical package SAS[®] Version 9.3.

Results

Table 1 shows the demographic, psychosocial, clinical and patient perceptions of care for all study participants by cancer site. More breast cancer survivors (n=213) than prostate survivors (n=112) were enrolled in the study. Most participants were white (76.6%), married (70.9%) and had a college degree (25.2%) or above educational level (17.3%). Majority (96.0%) of survivors in this sample were insured. A little more than half of both groups (55.7%) had two or fewer comorbid illnesses. A higher proportion of prostate survivors (36.6%) than breast survivors (27.7%) reported using a PCP for cancer follow-up in the past two years. The majority of prostate survivors (80.4%) and breast cancer survivors (93.9%) were still seeing a cancer specialist for follow-up. Additional differences between prostate and breast cancer survivors are displayed in Table 1.

Cancer site was associated with activation (p-value=0.039), with breast survivors reporting slightly higher mean scores (M=3.34, SD=0.37) when compared to prostate survivors (M=3.25, SD=0.38) (see Table 2). Demographic factors were not significantly associated with activation in breast survivors. Yet, uncertainty about the future (p-value=0.004) was related to activation, with breast survivors who 'very often' had thoughts of uncertainty having the lowest mean activation scores (M=3.17, SD=0.48) compared to reported less frequent concerns of uncertainty. In prostate survivors, race (p-value=0.048), marital status (p-value<0.001), employment status (p-value=0.004) and income (p-value=0.050) were significantly associated with activation scores. Prostate survivors identifying as Caucasian had the highest mean PAM scores (M=3.30, SD=0.38) compared to survivors reporting "other" racial categories (M=3.12, SD=0.13), or Black and/or African American (M=3.09, SD=0.46). Unmarried prostate survivors had lower activation scores (M=2.99, SD=0.48), than their married counterparts (M=3.31, SD=0.33). Unemployed prostate survivors had the lowest mean activation scores (M=2.93, SD=0.49). Prostate survivors with the lowest income (<20K) also had the lowest activation (M=3.07, SD=0.38) (See Table 2 for employment and income scores). In prostate survivors only, fear of recurrence was significantly associated with activation scores (p-value=0.004), on average those who reported thinking of cancer recurrence fears 'very often' had the lowest average activation scores (M=2.98, SD=0.36).

There was a positive relationship between perceptions of ease of access and time spent with clinicians and patient activation. Specifically, in both prostate and breast survivors reports of ease of access to cancer-related and PCPs were positive predictors of patient activation (all p-values<0.001). A similar trend for patients' perceptions of time spent with primary care and cancer-related clinicians on patient activation was found for both groups (all p-values<0.01). Among prostate survivors, the highest mean PAM score were found among those who strongly agreed [M=3.46, SD=0.47] that their PCPs spent enough time with them, decreasing for those who agreed [M=3.24, SD=0.30], and lowest among those who disagreed or were uncertain [M=3.07, SD=0.42]. For perceptions about time spent with cancer-related clinicians among prostate, these values were 3.48 (0.49), 3.22 (0.29), and 3.09 (0.34), respectively. Similarly, in breast survivors the highest activation score was found among those who strongly agreed [M=3.49, SD=0.30] that their PCPs spent enough time with them, decreasing among those who agreed [M=3.32, SD=0.36] and among those who disagreed or were uncertain [M=3.19, SD=0.45]. For perceptions of time spent with cancer-related clinicians among breast cancer survivors these averages were 3.52 (0.29), 3.27 (0.35), and 3.09 (0.43), respectively.

Significant interactions between patients' perceptions of time spent with PCPs and income on patient activation were observed (see Table 3). The associations between time spent with a PCP on activation were significantly modified by household income in both prostate (p-value=0.040) and breast survivors (p-value=0.036). For prostate survivors, in the middle income (p-value=0.013) and highest income (p-value=0.002) groups there were significant effects on patient activation, while those in the lowest income group saw no such effects. Among prostate survivors in the middle income group as perceptions of time spent were rated more favorably activation levels increased [M=2.89, SD=0.41; M=3.35, SD=0.38; and M=3.52, SD=0.43]. Among prostate survivors in the high income group activation scores

were relatively the same among those who agreed and disagreed that time spent with the PCP was adequate while there was an observed increase in activation among high income survivors who strongly agreed [M=3.25, SD=0.30 (uncertain/disagree); M=3.22, SD=0.23 (agree); M=3.62, SD=0.36 (strongly agree)]. In breast survivors significant effects for time spent with PCPs on activation were found among those in the middle (p-value=0.007) and high income (p-value=0.001) groups, while those in the lowest income group saw no such effects. Breast survivors in the middle income group, reported slightly higher activation among those who disagreed or were uncertain if the doctor spent enough time (M=3.32, SD=0.35), than breast survivors who agreed (M=3.14, SD=0.38); however, an increase was observed among survivors who strongly agreed (M=3.49, SD=0.27). Whereas, among breast survivors in the highest income group as perception of time spent increased activation levels increased [M=3.13, SD=0.50; M=3.41, SD=0.32; and M=3.49, SD=0.30], respectively.

Conclusions

This study aimed to describe the determinants of patient activation in breast and prostate cancer survivors to inform assessment and intervention development to support self-management during survivorship. This study found that breast cancer survivors are on average, significantly more activated than prostate survivors. Further, unlike breast survivors, prostate survivors' activation scores were associated with several demographic characteristics such as race, marital status, employment, and income. There were some similarities among breast and prostate survivors, with psychosocial variables in both associated with lower activation; [23–25] however, different variables were significant for each cancer site. In prostate survivors, frequent concerns about disease recurrence were associated with lower activation compared to those who worried less frequently. While in breast survivors, frequent worries about the uncertainty of the future was associated with lower activation compared to those who reported less worries about the uncertainty of their future. Clinically, the relationship between psychosocial factors and patient activation may be important to consider assessing and intervening appropriately.

A notable finding of this study is that for both breast and prostate survivors' perceptions of easy access to their providers (both PCPs and oncologists) were associated with activation. In chronic illness models the relationship between providers and patients are seen as transactional, involving an interpersonal exchange [26]. This study's results are similar with research in chronically ill populations that have demonstrated that better access to physicians is associated with higher patient activation scores [26]. Physicians' communication skills, particularly listening skills and promoting exploration of patient issues during encounters have been found to enhance activation, because patients are more engaged and invested in the decisions made which in turn improves patient adherence to physicians' recommendations [27, 28]. Future explorations of cancer survivors activation should extend the work of studies in other chronically ill populations which have shown that patients' perceptions of time spent with physicians, clarity of explanations and being treated fairly and with respect were associated with higher patient activation levels [26].

As cancer follow-up shifts into a chronic disease model of care empirically tested interventions that target activation are needed [26]; further, these may need to be tailored to

the specific needs of subpopulations. Previous studies have shown that activation varies by how many and the types of chronic conditions a patient is managing; generally, patients who have multiple chronic illnesses also have lower levels of activation [14]. Consistent with the results of this study, patients with a cancer history generally reported higher activation levels on average [14]. Our present study found women survivors of breast cancer have higher average activation levels than male prostate survivors. To our knowledge, no previous studies have reported on differences between types of cancers; however, studies have reported significant effects for gender on activation in other chronically ill populations. In a nationally representative sample of U.S., the overall adjusted scores of patient activation were significantly higher for adult females than males [14]. However, a different study assessing patient activation rates among racial and ethnic minorities in a low income setting found patient activation was significantly higher among men when compared to woman [29]. In the general population the trends suggest that men engage in less preventative health seeking behaviors and this tends to be more pronounced among low income men [30–32]. Therefore, additional research is needed to further tease apart the effect of gender and other sociodemographic characteristics on patient activation. Breast and prostate survivors also may interact differently with their healthcare teams based on the nature of their illnesses; and, how this impacts long term activation warrants future study. Both breast and prostate survivors generally report strong attachments to their oncology providers [33]; however, many prostate survivors navigate treatment decisions with ambiguous information which have an impact on the long-term effects they experience [34]. Therefore, there may be different processes and consequences of care in these populations beyond gender alone that need to be considered.

Patient activation interventions may be promising to address health disparities in cancer survivors. Patients in lower socioeconomic groups tend to have lower levels of activation [12, 14]. Patients with lowest levels of activation also appear to be most responsive to interventions [8] and several programs targeting other conditions have been effective at increasing activation over time [19, 35–37]. This is consistent with our study, for both breast and prostate survivors those in middle and the highest income groups who agreed most strongly that the PCP spent enough time with them reported the highest activation scores. Patient activation intervention development may benefit from considering both the factors that impact provider-patient relationships and patient activation. Studies have shown that when patients with high and low activation scores are seen by the same clinician, those with higher scores report more positive experiences than those with lower activation scores, when controlling for sociodemographic factors and health status [38]. Additionally, less activated patients are less likely to have a usual source of care, even after controlling for socio-economic and health status factors [14]. In cancer survivors there is a focus on transitioning patient from acute care to follow-up care, which typically does not account for whether survivors have an established usual source of care.

This study provides a descriptive understanding the factors that are associated with patient activation among breast and prostate cancer survivors' treated in academic and community settings. There are several points to consider in developing future research to further investigate patient activation among cancer survivors. First, we used a regional sampling strategy, and cannot generalize these findings nationally. However, given the widespread

application of patient activation across multiple chronic conditions adding patient activation into existing nationally representative datasets would help to develop a broader understanding of activation and its relationship to cancer follow up as well as other clinical outcomes. In this study, the PAM measure we used varied from the traditional PAM because a modified response scale that included “uncertain” as its mid-point was how the data was collected. This may limit the direct comparability of scores reported in this study to those in other chronic disease populations where the original PAM response options and scoring were used. In future studies, using the traditional PAM would allow for direct comparison between cancer survivors and other chronically ill populations. Additionally, the development and evaluation of interventions to improve patient activation and its impacts on care seeking and self-management behaviors in cancer survivors could inform the development of evidence based approaches to survivorship care.

Acknowledgments

Funding/Sponsorship: Ms. O'Malley was supported through a Doctoral Training Grant in Oncology Social Work (DSW 13-279-01) from the American Cancer Society. Data collection for this study was funded by the National Cancer Institute grant R03 CA154063 awarded to Dr. Hudson. Additional support for this study was provided by the National Cancer Institute grants K01 CA131500, R01 CA176838, and P30 CA072720. This research was conducted in conjunction with the Rutgers Cancer Institute of New Jersey's Oncology Research Group.

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Table 1

Subject Characteristics

	Prostate Survivors N=112	Breast Survivors N=213	Total N=325
* PAM (1–4)	3.25 (0.38)	3.34 (0.37)	3.31 (0.38)
* Age (years)	70.0 (8.3)	61.2 (10.7)	64.2 (10.8)
* BMI (kg/m ²)	28.1 (4.2)	28.4 (6.5)	28.3 (5.8)
* Years Post Cancer Diagnosis	6.43 (2.99)	8.37 (4.64)	7.76 (4.29)
Race			
White/Caucasian	79 (70.5%)	170 (79.8%)	249 (76.6%)
Black/African American	18 (16.1%)	31 (14.6%)	49 (15.1%)
Other	15 (13.4%)	12 (5.6%)	27 (8.3%)
Marital Status			
Unmarried	23 (20.7%)	71 (33.5%)	94 (29.1%)
Married	88 (79.3%)	141 (66.5%)	229 (70.9%)
Education Level			
High School	36 (34.0%)	52 (24.6%)	88 (27.8%)
Some College	24 (22.6%)	70 (33.2%)	94 (29.7%)
4-Year Degree	30 (28.3%)	50 (23.7%)	80 (25.2%)
Masters/Graduate School	16 (15.1%)	39 (18.5%)	55 (17.3%)
Employment Status			
Full-time	21 (18.9%)	76 (35.7%)	97 (29.9%)
Part-time	8 (7.2%)	25 (11.7%)	33 (10.2%)
Not Employed	17 (15.3%)	35 (16.4%)	52 (16.1%)
Retired	65 (58.6%)	77 (36.2%)	142 (43.8%)
Currently Insured			
No	11 (9.9%)	2 (0.9%)	13 (4.0%)
Yes	100 (90.1%)	211 (99.1%)	311 (96.0%)
Current Household Income			
< \$20,000	25 (23.4%)	19 (9.5%)	44 (14.3%)
\$20,000 – \$59,000	36 (33.6%)	59 (29.5%)	95 (31.0%)
\$60,000+	46 (43.0%)	122 (61.0%)	168 (54.7%)
Recurrence/Second Cancer			
No	100 (90.9%)	193 (90.6%)	293 (90.7%)
Yes	10 (9.1%)	20 (9.4%)	30 (9.3%)
Years Since Last Treatment			
< 2	11 (10.4%)	9 (4.3%)	20 (6.3%)
2–5	56 (52.8%)	111 (52.6%)	167 (52.7%)
6 – 10	33 (31.1%)	62 (29.4%)	95 (30.0%)

	Prostate Survivors N=112	Breast Survivors N=213	Total N=325
10 +	6 (5.7%)	29 (13.7%)	35 (11.0%)
Number of Comorbidities			
0 – 2	60 (53.6%)	121 (56.8%)	181 (55.7%)
3 +	52 (46.4%)	92 (43.2%)	144 (44.3%)
~ Doctors Used for Cancer Follow-up (Last 2 Yrs.)			
PCP	41 (36.6%)	59 (27.7%)	100 (30.8%)
Cancer Specialist/Oncologist	90 (80.4%)	200 (93.9%)	290 (90.1%)
Obstetrician/Gynecologist	N/A	71 (33.3%)	71 (22.4%)
Ideal Cancer-related Follow-up			
PCP	19 (18.1%)	6 (2.8%)	25 (7.9%)
Cancer Specialist/Oncologist	85 (81.0%)	205 (96.7%)	290 (91.5%)
Other	1 (0.9%)	1 (0.5%)	2 (0.6%)
Uncertainty About Future			
Almost Never	29 (26.9%)	44 (20.7%)	73 (22.8%)
Not Very Much	28 (25.9%)	53 (25.0%)	81 (25.3%)
Sometimes	39 (36.1%)	82 (38.7%)	121 (37.8%)
Very Often	12 (11.1%)	33 (15.6%)	45 (14.1%)
Fear of Cancer Recurrence			
Almost Never	24 (22.0%)	15 (7.2%)	39 (12.3%)
Not Very Much	28 (25.7%)	29 (13.9%)	57 (17.9%)
Sometimes	40 (36.7%)	106 (50.7%)	146 (45.9%)
Very Often	17 (15.6%)	59 (28.2%)	76 (23.9%)
Easy Access to Medical Care			
<i>PCPs</i>			
Disagree/Uncertain	13 (12.4%)	14 (6.9%)	27 (8.8%)
Agree	70 (66.6%)	104 (51.5%)	174 (56.7%)
Strongly Agree	22 (21.0%)	84 (41.6%)	106 (34.5%)
<i>Cancer-Related Clinician(s)</i>			
Disagree/Uncertain	13 (15.5%)	10 (4.9%)	23 (8.0%)
Agree	51 (60.7%)	103 (50.8%)	154 (53.7%)
Strongly Agree	20 (23.8%)	90 (44.3%)	110 (38.3%)
Doctors Spend Enough Time			
<i>PCPs</i>			
Disagree/Uncertain	22 (21.4%)	41 (20.3%)	63 (20.6%)
Agree	60 (58.2%)	104 (51.5%)	164 (53.8%)
Strongly Agree	21 (20.4%)	57 (28.2%)	78 (25.6%)
<i>Cancer-Related Clinician(s)</i>			
Disagree/Uncertain	18 (21.2%)	32 (15.7%)	50 (17.3%)
Agree	44 (51.7%)	97 (47.5%)	141 (48.8%)

	Prostate Survivors N=112	Breast Survivors N=213	Total N=325
Strongly Agree	23 (27.1%)	75 (36.8%)	98 (33.9%)

Data presented as n (%) unless otherwise indicated.

* Data presented as mean (SD).

~ Percentages add to more than 100% because participants could select more than one option.

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Table 2

Patient Activation – Mean (SD) or Correlation (95% CI)

Subject Characteristics	Prostate Survivors N=112	P-value	Breast Survivors N=213	P-value
* Age (years)	0.07 (-0.12, 0.25)	0.48	-0.09 (-0.23, 0.04)	0.18
* BMI (kg/m ²)	0.003 (-0.19, 0.19)	0.98	0.02 (-0.12, 0.16)	0.77
* Years Post Cancer Diagnosis	-0.09 (-0.29, 0.12)	0.38	-0.03 (-0.16, 0.11)	0.70
Race				
White/Caucasian	3.30 (0.38)	0.048	3.33 (0.38)	0.92
Black/African American	3.09 (0.46)		3.36 (0.30)	
Other	3.12 (0.13)		3.34 (0.37)	
Marital Status				
Unmarried	2.99 (0.48)	< 0.001	3.33 (0.38)	0.84
Married	3.31 (0.33)		3.34 (0.37)	
Educational Level				
High School	3.16 (0.43)	0.23	3.34 (0.36)	0.41
Some College	3.29 (0.37)		3.32 (0.37)	
4 Year Degree	3.35 (0.38)		3.29 (0.38)	
Masters/Graduate School	3.23 (0.21)		3.42 (0.37)	
Employment Status				
Full-time	3.36 (0.36)	0.004	3.35 (0.38)	0.26
Part-time	3.24 (0.37)		3.24 (0.26)	
Not Employed	2.93 (0.49)		3.27 (0.44)	
Retired	3.28 (0.33)		3.38 (0.35)	
Currently Insured				
No	3.07 (0.26)	0.13	3.22 (0.04)	0.66
Yes	3.27 (0.38)		3.34 (0.37)	
Household Income				
< \$20,000	3.07 (0.38)	0.050	3.42 (0.35)	0.27
\$20,000 – \$59,000	3.26 (0.44)		3.29 (0.36)	
\$60,000 +	3.30 (0.31)		3.37 (0.38)	
Recurrence/Second Cancer				
No	3.24 (0.39)	0.54	3.35 (0.38)	0.17
Yes	3.32 (0.30)		3.23 (0.29)	
Years Since Last Treatment				
< 2	3.22 (0.30)	0.35	3.24 (0.58)	0.63
2 – 5	3.31 (0.38)		3.32 (0.32)	
6 – 10	3.16 (0.39)		3.38 (0.41)	
10 +	3.25 (0.39)		3.36 (0.34)	
Number of Comorbidities				

Subject Characteristics	Prostate Survivors N=112	P-value	Breast Survivors N=213	P-value
0 – 2	3.30 (0.40)	0.12	3.38 (0.35)	0.052
3 +	3.18 (0.35)		3.28 (0.39)	
~ Doctors Used for Cancer Follow-up (Last 2 Years)				
No PCP	3.25 (0.40)	0.84	3.33 (0.36)	0.56
PCP	3.24 (0.36)		3.36 (0.41)	
No Cancer Specialist	3.19 (0.34)	0.50	3.27 (0.40)	0.50
Cancer Specialist	3.26 (0.39)		3.34 (0.37)	
No Obstetrician/Gynecologist	N/A	N/A	3.34 (0.35)	0.86
Obstetrician/Gynecologist			3.33 (0.41)	
Cancer-related Follow-up Doctor				
PCP	3.28 (0.32)	0.14	3.52 (0.32)	0.16
Cancer Specialist/Oncologist	3.26 (0.37)		3.33 (0.37)	
Other	4.00 (N/A)		2.79 (N/A)	
Uncertainty About Future				
Almost Never	3.38 (0.44)	0.067	3.48 (0.33)	0.004
Not Very Much	3.27 (0.36)		3.33 (0.34)	
Sometimes	3.19 (0.32)		3.32 (0.33)	
Very Often	3.06 (0.42)		3.17 (0.48)	
Fear of Cancer Recurrence				
Almost Never	3.39 (0.34)	0.004	3.52 (0.32)	0.13
Not Very Much	3.33 (0.36)		3.38 (0.32)	
Sometimes	3.21 (0.38)		3.33 (0.38)	
Very Often	2.98 (0.36)		3.28 (0.39)	
Easy Access to Medical Care				
<i>PCPs</i>				
Disagree/Uncertain	2.93 (0.36)	< 0.001	3.14 (0.47)	< 0.001
Agree	3.21 (0.32)		3.22 (0.33)	
Strongly Agree	3.55 (0.37)		3.52 (0.35)	
<i>Cancer-Related Clinician(s)</i>				
Disagree/Uncertain	3.02 (0.33)	< 0.001	3.13 (0.49)	< 0.001
Agree	3.20 (0.32)		3.20 (0.31)	
Strongly Agree	3.62 (0.36)		3.51 (0.35)	
Doctors Spend Enough Time				
<i>PCPs</i>				
Disagree/Uncertain	3.07 (0.42)	0.003	3.19 (0.45)	< 0.001
Agree	3.24 (0.30)		3.32 (0.36)	
Strongly Agree	3.46 (0.47)		3.49 (0.30)	
<i>Cancer-Related Clinician(s)</i>				
Disagree/Uncertain	3.09 (0.34)	0.003	3.09 (0.43)	< 0.001

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Subject Characteristics	Prostate Survivors N=112	P-value	Breast Survivors N=213	P-value
Agree	3.22 (0.29)		3.27 (0.35)	
Strongly Agree	3.48 (0.49)		3.52 (0.29)	

Data presented as mean (SD) unless otherwise indicated.

* Data presented as Pearson correlation coefficient (95% CI).

~ Percentages sum exceed 100% because multiple response.

P-values derived from F-tests assessing association between mean activation and subject level characteristics.

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Table 3

Mean (SD) of Patient Activation at each Level of Income Stratified by Time Spent with PCPs or Cancer-Related Clinicians

	PCPs										Cancer-Related Clinician									
	Prostate					Breast					Prostate					Breast				
	Disagree/Uncertain	Agree	Strongly Agree	P-Value		Disagree/Uncertain	Agree	Strongly Agree	P-value		Disagree/Uncertain	Agree	Strongly Agree	P-value		Disagree/Uncertain	Agree	Strongly Agree	P-value	
<20K	3.00 (0.52)	3.13 (0.28)	2.99 (0.56)	0.73		3.35 (0.37)	3.34 (0.40)	3.63 (0.24)	0.29		2.74 (0.16)	3.16 (0.20)	3.19 (0.77)	0.23		3.25 (0.08)	3.32 (0.36)	3.71 (0.29)	0.11	
20K-59K	2.89 (0.41)	3.35 (0.38)	3.52 (0.43)	0.013		3.32 (0.35)	3.14 (0.38)	3.49 (0.27)	0.007		2.86 (0.34)	3.33 (0.40)	3.39 (0.45)	0.10		3.14 (0.28)	3.13 (0.40)	3.49 (0.27)	< 0.001	
>60K	3.25 (0.30)	3.22 (0.23)	3.62 (0.36)	0.002		3.13 (0.50)	3.41 (0.32)	3.49 (0.30)	0.001		3.27 (0.25)	3.17 (0.23)	3.64 (0.35)	< 0.001		3.07 (0.52)	3.35 (0.32)	3.55 (0.29)	< 0.001	
				0.040 *					0.036 *					0.059 *					0.39 *	

Patient Activation scores: range from 1-4 (1=low 4=high)

Data Presented as mean (SD).

P-values derived from F-tests assessing association between mean activation, time spent with clinicians at each level of income, unless otherwise indicated.

* P-values derived from F-tests assessing whether income modifies the association between mean activation and time spent with clinicians.