Associations Between Religion-Related Factors and Cervical Cancer Screening Among Muslims in Greater Chicago

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Abstract

Objective—This study aimed to assess rates of Papanicolaou (Pap) testing and associations between religion-related factors and these rates among a racially and ethnically diverse sample of American Muslim women.

Materials and Methods—A community-based participatory research design was used in partnering with the Council of Islamic Organizations of Greater Chicago to recruit Muslim women attending mosque and community events. These participants self-administered surveys incorporating measures of fatalism, religiosity, perceived discrimination, Islamic modesty, and a marker of Pap test use.

Results—A total of 254 survey respondents were collected with nearly equal numbers of Arabs, South Asians, and African American respondents. Of these respondents, 84% had obtained a Pap test in their lifetime, with individuals who interpret disease as a manifestation of God's punishment having a lower odds of having had Pap testing after controlling for sociodemographic factors (odds ratio [OR] = 0.87, 95% CI = 0.77–1.0). In multivariate models, living in the United States for more than 20 years (OR = 4.7, 95% CI = 1.4–16) and having a primary care physician (OR = 7.7, 95% CI = 2.5–23.4) were positive predictors of having had a Pap test. Ethnicity, fatalistic beliefs, perceived discrimination, and modesty levels were not significantly associated with Pap testing rates.

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Conclusions—To our knowledge, this is the first study to assess Pap testing behaviors among a diverse sample of American Muslim women and to observe that negative religious coping (e.g., viewing health problems as a punishment from God) is associated with a lower odds of obtaining a Pap test. The relationship between religious coping and cancer screening behaviors deserves further study so that religious values can be appropriately addressed through cancer screening programs.

Keywords

Pap testing; Islam; cancer screening disparities; religious discrimination

For the past 50 years, routine Papanicolaou (Pap) testing has contributed to the substantial decline in cervical cancer incidence and mortality among United States (US) women. Nowadays, nearly 83% of US women obtain routine Pap tests,[1] and as a consequence, the morbidity associated with cervical cancer predominately affects those who have never obtained Pap testing. Accordingly, half of the women diagnosed with cervical cancer, including those found to have invasive cervical cancer, have never received a Pap test.[2,3] Identifying the characteristics of women who are unable to obtain Pap testing, and understanding the particular barriers they face, is critical to developing targeted interventions that reduce the burden of cervical cancer.

The current literature on cervical cancer screening disparities highlights the influence of socioeconomic factors, racial and ethnic affiliation, and immigrant status on Pap testing patterns but overlooks the influence of religious identity or affiliation. Current data note that women who are poor or less educated are less likely to receive cervical cancer screening.[1,4–6] Among racial and ethnic minorities, Asians seem to have the lowest average rates of routine Pap testing, with approximately 76% having obtained the test in the previous 3 years.[1] Immigrants,[1,7–9] in general, irrespective of racial or ethnic affiliation, also have lower rates of Pap testing than their US-born counterparts. In contrast, cervical cancer screening disparities among religious minorities are largely unknown, and the relationships between religion-related factors and Pap testing practices are similarly not well elucidated. These knowledge gaps are partially explained by the fact that most national surveillance systems do not routinely collect data on religious affiliation or incorporate measures of religiosity, thereby challenging the measurement of population-based representative health metrics. Nonetheless, several studies suggest that religion-related values influence cervical cancer screening. For example, fatalistic beliefs are known to contribute to lower screening rates, and to the lack of timely follow-up for abnormal cervical cytology, among South Asians,[9] Latinas,[10–12] and other minorities.[13–15] In addition, the idea that Pap tests threaten one's virginity has been found among several minority ethnic groups[16,17] contributing to a fear of testing-associated stigma within these communities.[18] The present study adds to this literature by measuring rates of Pap testing among an ethnically and racially diverse group of American Muslims and by assessing relationships between several religion-related factors and Pap testing in this community.

American Muslims number between 5 and 7 million,[18–21] and this community is chiefly composed of African Americans (35%), Arabs (25%–30%), and South Asians (20%–

25%).[18,22] Religious beliefs and values seem to significantly influence health behaviors across the ethnic and racial diversity of this community.[23] Illustratively, diverse groups of Muslims have reported that a God-centered framework of health and disease shapes their health care–seeking attitudes, that they look to Islamic ethicolegal guidance when considering therapeutics, and that they share concerns for maintaining modesty during clinical encounters.[24,25]

With respect to cervical cancer screening, little research has been conducted among American Muslims. One study of 15 Muslim women aged 18 to 25 years in San Francisco found that only 1 had undergone Pap testing. These women reported that they were reluctant to obtain Pap testing in part because they did not believe those performing the test would respect their concerns regarding modesty.[17] Another study included 50 Arab Muslim women in Pennsylvania and found that only half had received Pap testing within the previous 3 years. Again, modesty concerns were negatively associated with screening.[26] A nationwide study of 225 South Asian women, of whom 24% were Muslim, reported that 73% of the sample had obtained a Pap test within the previous 3 years and that there was no significant difference in rates between Muslims and non-Muslims.[27] That study did not examine religion-related factors but did report that having received a timely Pap test was independently associated with being married, having higher education, having a usual source of medical care, and being more acculturated.[27]

On the basis of these studies and our previous work, we hypothesized that screening rates among American Muslims would be lower than national averages. Because religious values may influence preventive health behaviors in ways that socioeconomic, educational, or acculturative factors do not, we also hypothesized that, as found in other minority groups, fatalistic beliefs and concerns about modesty would both be independently and negatively associated with having received Pap testing.

METHODS

More than 400,000 Muslims[28] live in the Chicago metro area. Our study used a community-based participatory research approach,[29] in collaboration with the Council of Islamic Organizations of Greater Chicago (CIOGC), a federation of more than 60 mosques, Muslim community centers, and social service organizations, and by forming a Community Advisory Board composed of leaders from several Muslim civic organizations. Community Advisory Board members assisted the project by providing feedback on study design and survey instruments, connecting the research team with community stakeholders, and facilitating data collection and results dissemination. The study was approved by the University of Chicago's Institutional Review Board.

Participant Recruitment and Data Collection

Between March and June 2012, we recruited self-identified Muslim, adult English-speaking women from 11 CIOGC-affiliated organizations (6 mosques and 5 service organizations). Because of theological differences, the Nation of Islam is not part of CIOGC federation and we did not study this group. We purposively selected recruitment sites to achieve near-equal representation of Arab, South Asian, and African American Muslims, with at least 1 mosque

and 1 non-mosque site for each group. Participants at each site were sought via recruitment tables and by direct solicitation. Each participant was invited to complete a self-administered survey after verbal consent was obtained and was provided with $20 remuneration.

Survey Instrument

Our study questionnaire predominately incorporated measures drawn from the extant health literature including measures that assessed Islamic religiosity, discrimination, and fatalism. Because there exists no measure of Islamic modesty, we generated an item pool on the basis of data from our previous qualitative interviews and focus groups with a diverse group of Muslims. The questions' wording was refined to enhance comprehension and precision through 10 cognitive interviews with a diverse set of Muslim women. The final measure, as well as the entire survey, was streamlined to reduce redundancy of items and confusing wording via expert panel review involving team members and mentors.

Outcome Variable—We asked whether respondents had ever had a Pap test.

Independent Variables

Islam-Related Factors

i. Religiosity: Two items assessed general religiosity. The first item was the Self-Rating of Religiosity (SRR), which asks the respondents to rate their religiosity in a 10-point scale.[30] The second item, from the Hoge Intrinsic Religious Motivation Scale,[31] asked participants to indicate whether they agreed or disagreed with the statement, "I try hard to carry my religious beliefs over into all my other dealings in life." In addition, we included 2 subscales of the Psychological Measure of Islamic Religiousness (PMIR).[32] The 7-item PMIR - Positive Religious Coping and Identification subscale measures the extent to which Muslims use religious coping methods (e.g., reading Qur'an, seeking forgiveness, cultivating reliance on God) to deal with life stressors.[32] The 3-item PMIR - Punishing Allah Reappraisa subscale assesses whether people interpret events in their life as a punishment from God. We rephrased these items to refer specifically to coping with a health problem. In our sample, the Positive Religious Coping and Identification subscale had a Cronbach $\alpha = 0.9$ and the Punishing Allah Reappraisal subscale had an $\alpha = 0.79$.

ii. Modesty: Using previous qualitative data, we developed 8 items (see Table 1), rated in a level of agreement scale, which assessed the behavioral and attitudinal components of Islamic modesty. The measure's α was 0.83 in our sample.

iii. Perceived Religious Discrimination in Health Care: To assess perceived religious discrimination, we used the 7-item Discrimination in Medical Settings scale and replaced the words "other people or others" with "non-Muslims" on 3 items.[33] This scale asks about the frequency with which patients experience being treated with less courtesy, respect, and poorer service than others and their perceptions of discrimination. This measure's α was 0.93 in our sample.

Fatalism—We used 2 measures of fatalism known to be associated with cancer screening practices.[34–36] The modified Powe Fatalism Inquiry (mPFI) assesses the extent to which a

person believes that cancer is a death sentence. We modified the original item wording such that it was appropriate to a Muslim context. The Religious Health Fatalism Questionnaire (RHFQ) assesses the extent to which a person believes that health outcomes are inevitable and controlled by God.[34,37] We used the Divine Provision and Destined Plan subscales of the RHFQ, again adapting items to fit a Muslim population.[34–36] The Divine Provision subscale included items such as "If a person has enough faith, healing will occur without doctors having to do anything" and "I do not worry about my health because it is in Allah's hands." The Destined Plan subscale included items such as "If I become ill, Allah has intended that to happen" and "Whatever illness I will have, Allah has already planned them." The mPFI had a Cronbach $\alpha = 0.80$, whereas for the RHFQ-Divine Provision, Cronbach $\alpha = 0.64$, and for the RHFQ-Destined Plan, Cronbach $\alpha = 0.86$ in our sample.

Sociodemographic Descriptors—We assessed age, ethnicity, marital status, country of origin, duration of US residency, household income, level of educational attainment, and health insurance status. In addition, we asked participants whether they had obtained a mammogram in the previous 2 years (yes/no).

Data Analyses

Two research assistants independently entered all data into Research Electronic Data Capture software.[38] Data disparities were resolved by referring to the original surveys. Summed scores for the modesty scale, the modified Discrimination in Medical Settings, the PMIR subscales, the mPFI, and RHFQ subscales were all transformed by assigning each response category a numerical value between 0 and 10. Average scores were calculated if a respondent answered greater than 50% of the items within each scale.

We used logistic regression models (analyses conducted with STATA/SE v.12.1 StataCorp, College Station, TX) to test the associations between all independent variables and having had a Pap test in one's lifetime. Variables found to be associated with outcomes at the level of $p < .1$ on bivariate analysis were placed into multivariate analyses. Interaction terms between sociodemographic variables were analyzed and interpreted if significant at $p < .05$. To avoid multicollinearity, the variable for mammogram status was not included in multivariate models as it too was predicted for by the religion-related and sociodemographic variables.

RESULTS

Participant Characteristics

There were 254 survey respondents, with a median age of 50 years (see Table 2). Our sample had nearly equal numbers of Arabs, South Asians, and African Americans. Most respondents had resided in the United States for more than 20 years, were married, had health insurance, and had access to a primary care physician (PCP). With respect to cancer screening, 84% (208/247) had received a Pap test in their lifetime, whereas 75% (185/248) had received a mammogram in their lifetime. Furthermore, 82% (163/198) of the women between the ages of 21 and 65 years (the age ranges where Pap testing is recommended at 3-year intervals) had undergone Pap testing at least once in their lifetime.

With respect to general religiosity, results were skewed in our sample. Forty-two percent (96/226) of women marked their religiosity as a "9" or "10" on a scale from 1 to 10, whereas 27% (62/226) rated themselves as an "8." Seventy-three percent (172/237) of the women completely agreed with the statement, "I try hard to carry my religious beliefs over into all my other dealings in life." In modesty, 84% (202/240) of the women completely agreed with the statement, "maintaining Islamic modesty is important to me." With respect to Muslim identity-based discrimination, 60% (145/240) of the women felt that they were never treated with less courtesy than non-Muslims and 66% (160/242) of the women felt that they were never treated with less respect.

Factors Associated With Having Had a Pap Test

Factors Related to Islam: Religiosity, Modesty, and Muslim Identity-Based Discrimination—Those who had reported perceived religious discrimination in health care were less likely (odds ratio [OR] = 0.81, 95% CI = 0.7–0.95) to have had a Pap test on bivariate analysis, although this effect did not remain significant after adjusting for sociodemographic characteristics (Models A and E; see Table 3). An inverse association between scoring higher on the PMIR - Punishing Allah Reappraisal subscale and ever having a Pap test was maintained in the bivariate (OR = 0.84, 95% CI = 0.75–0.94) and multivariate models (Model B: OR = 0.87, 95% CI = 0.77–1.0). Measures of general religiosity, modesty, and positive religious coping were not associated with cervical cancer screening rates.

Fatalism—All 3 fatalism measures (mPFI, RHFQ - Divine Provision, and RHFQ - Destined Plan) were inversely associated with cervical cancer screening in the bivariate analyses (OR = 0.84, 95% CI = 0.72–0.98; OR = 0.86, 95% CI = 0.77–0.96; and OR = 0.81, 95% CI = 0.7–0.95, respectively). Yet, none of these associations remained significant in models adjusting for sociodemographic variables (Models C, D, and E).

Sociodemographic Factors—Bivariate analyses demonstrated that more years of US residency (11–20 y: OR = 5.5, 95% CI = 1.9–16.3; >20 y: OR = 10.7, 95% CI = 4.4–25.7), higher levels of educational attainment in general (high school: OR = 2.5, 95% CI = 0.9–7; associate's degree: OR = 5.1, 95% CI = 1.6–16.6; bachelor's degree: OR = 3.6, 95% CI = 1.2–10.6; advanced degree: OR = 3.5, 95% CI = 1.1–11.4), having a PCP (OR = 11.1, 95% CI = 5–24.4), and having had a mammogram (OR = 10.75, 95% CI = 5–23.2) all significantly increased the odds of having obtained a Pap test. Participant's age, race/ethnicity, marital status, and household income were not significantly associated with cervical cancer screening. In multivariate models, having resided in the United States for more than 20 years and having a PCP continued to be significant predictors of having had a Pap test.

DISCUSSION

In this study of an ethnically and racially diverse group of American Muslim women in Greater Chicago, a relatively high percentage of women reported having had obtained a Pap test in their lifetime. Rates of screening did not vary by ethnicity. However, women who

viewed health problems as a punishment from God had decreased odds of having undergone Pap testing. Women who had lived in the United States for more than 20 years and those with access to a PCP had the highest odds of having had Pap testing. These findings are consistent with an earlier study of US immigrants in which longer lengths of residence were associated with higher rates of cervical cancer screening,[39] a study of South Asian women, including those more acculturated Muslims (in part measured by increasing years of US residence), were more likely to have undergone Pap testing,[27] and with national data reporting that having access to a regular physician is positively associated with routine Pap testing.[40]

To our knowledge, this is the first study to observe that negative religious coping (e.g., viewing health problems as a punishment from God) is associated with lower odds of receiving a Pap test. The relationship between religious coping and preventative cancer screening behaviors should be studied further. Positive religious coping, which represents the use of religious support mechanisms such as prayer, and congregational support, for understanding and managing life stressors, was found to be associated with cancer screening adherence (mammography, Pap testing, and colonoscopy) among Latina women, but negative religious coping had no relationship to screening in the study of Allen et al.[41] It is possible that viewing health problems as indicative of God's displeasure leads to a type of resignation, and thus to not seeking cervical cancer screening, different from that which follows from believing cancer to be part of God's decree that cannot be changed (fatalism, which was not associated with screening in our study). Studies that tease out, and clarify, how coping mechanisms motivate health behaviors may open up new areas for health intervention.

Further, with respect to fatalism, we found that the significant inverse relationships between all 3 measures of fatalism and Pap test status were attenuated when acculturative factors (in this case, length of US residency) and educational level were adjusted for within multivariate models. This finding supports studies that suggest fatalistic beliefs to be more frequently encountered among people with lower levels of education and among individuals who are less acculturated, and it is these individuals who delay cancer screening.[14,42] Alternatively, it is possible that "fatalistic beliefs" may motivate different health behaviors among Muslims. Indeed, research among Muslims suggests that a complete reliance on God, and viewing God's decree as the means of cure, does not exclude receiving medical care.[43] Analogous concepts are also found among Latinas.[44] More refined measures are needed to unpack the influence of "fatalistic" notions on cancer screening among American Muslims. These measures may be important for developing tailored interventions to improve cancer control because fatalistic beliefs are independently associated with some cancer outcomes (e.g., breast cancer)[45,46] even apart from their influence on screening behavior.

That modesty did not influence Pap screening rates suggests that American Muslim women may pursue cervical cancer screening even where it may seem to, at least on the surface, challenge their views about maintaining modesty. Thus, our data do not corroborate qualitative studies that report modesty concerns as preventing Muslim women from obtaining cancer screening[17,24,47–49] and suggest that interactions between modesty concerns and Muslim health behaviors may require more detailed pathway-focused studies.

Our null finding may be explained in different ways. First, modesty concerns are often voiced in the context of sex discordant care, and with most obstetricians and gynecologists being women,[50] modesty concerns may not be as prominent in these encounters. Second, it is possible that our pilot measure was not sensitive enough to adequately capture modesty concerns related to cancer screening.

Finally, the majority (84%; 208/247) of women we surveyed had received a Pap test at least once in their lifetime. This finding likely reflects that most of our participants had access to a regular physician and had lived in the United States for more than 20 years, thereby likely being more acculturated to US health screening norms. Yet, our data do not speak to how many women obtained timely Pap testing according to current guidelines. The Healthy 2020 target is for 93% of women between the ages of 21 and 65 years to receive Pap testing every 3 years; given that less than 93% of our sample obtained a Pap test once in their lifetime and that 85% of our sample had access to regular physician, our data suggest that improving Pap screening rates in this community will require interventions beyond efforts that seek to improve access. Given that interpretations of disease as part of God's punishment were inversely related to Pap testing, involving imams and mosque communities in a religiously tailored community intervention may prove to be a worthwhile strategy for intervention and merits pilot testing. As there exist few proven health interventions that have involve imams, and few collaborations between mosque communities and health researchers, we suggest that, as a first step, the American Muslim community leaders and stakeholders begin to build networks with health care delivery and research organizations so as to facilitate long-term durable partnerships that address the community's cancer-related health challenges.

Our results must be interpreted in light of several limitations. We targeted respondents who were English literate, as 87% of American Muslims are,[51] and reside within the large Chicago Muslim community. Therefore, Muslims with lower levels of English literacy, and residing in Muslim communities of smaller size, may experience different, and likely greater, barriers to cervical cancer screening. Selection bias was also introduced by our purposively recruiting participants at Muslim community organizations to assess religion-related factors associated with screening. Thus, our findings cannot be generalized to Muslims with lower levels of religiosity. Another limitation resides in our outcome variable. Although it is important to know about the characteristics of women who have never had Pap testing, it is also critically important to describe how recent and how frequently Pap screening is obtained, as well as the age at which that screening occurs, to understand the gaps in screening guideline adherence. As a first step, we chose to use an outcome that is commonly used in the literature; however, future studies can build on our work to ascertain more granular and clinically relevant data. Other directions for future research that can help provide insight into cervical cancer prevention among Muslims may include exploring beliefs about, and practices of, human papillomavirus vaccination, which is now part of routine cervical cancer prevention strategies. Human papillomavirus vaccination guidelines assume a certain level of sexual activity among the general populace. It would be worth exploring how Muslim women perceive their risk of the disease, how their providers frame the benefits of vaccination, and whether vaccination is more acceptable than Pap testing. Furthermore, our study found that having a PCP was a strong predictor of having had a Pap test. It would be worthwhile for future studies to explore this relationship in more depth by

looking at how trust of physicians and racial, ethnic, or sex concordance affect the uptake of Pap testing by patients.

Acknowledgments

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TABLE 1

Items From Pilot Measure to Assess Islamic Modesty

Question Stem
When I am in a mixed sex gathering or outside the home, I cover my entire body, except my hands and face.
When I have guests at my home, men and women sit separately.
An unmarried man and unmarried woman should not be alone together.
I always look for a female doctor for myself.
I have delayed seeking medical care when no woman doctor is available to see me.
Hospital gowns are not modest.
My clothing demonstrates a commitment to Islamic modesty.
Maintaining Islamic modesty is important to me.

TABLE 2

Sociodemographic Characteristics of Participants ($N = 254$)

Characteristics	
Age ($n = 220$)	
21–65 y, *n* (%)	198 (90)
Median (range), y	50 (25–85)
Racial/ethnic background (n = 233), *n* (%)	
Arab/Arab American	77 (33.0)
African American/Black	60 (25.8)
South Asian	78 (33.5)
Country of origin ($n = 240$), *n* (%)	
United States	77 (32.1)
Palestine	37 (15.4)
India	30 (12.5)
Pakistan	30 (12.5)
Jordan	14 (5.8)
Duration in the United States ($n = 239$), *n* (%)	
10 y	38 (15.9)
11–20 y	45 (18.8)
>20 y	156 (65.3)
Marital status ($n = 237$), *n* (%)	
Married	174 (73.4)
Level of educational attainment ($n = 236$), *n* (%)	
Less than high school	32 (13.6)
High school	55 (23.3)
Associate's degree	54 (22.9)
Bachelor's degree	57 (24.2)
Advanced degree	38 (16.1)
Annual household income ($n = 225$), *n* (%)	
$45,000	129 (57.3)
$45,001–$105,000	67 (29.8)
$105,001	29 (12.9)
Have health insurance ($n = 238$), *n* (%)	181 (76.1)
Have a primary care physician ($n = 246$), *n* (%)	208 (84.6)
Have had a mammogram ($n = 248$), *n* (%)	185 (74.6)
Have had a Pap test ($n = 247$), *n* (%)	208 (84.2)

TABLE 3

Unadjusted and Adjusted Odds Ratios for the Relationship Between Variables of Interest and Cervical Screening Status

	Unadjusted OR (95% CI)	Adjusted OR (95% CI)					
		Model A	Model B	Model C	Model D	Model E	Model F[a]
Factors related to Islam							
Self-Rating of Religiosity	3.1 (0.4–24.4)						
PMIR - Positive Religious Coping and Identification	1.0 (0.8–1.3)						
Hoge Intrinsic Religiosity	1.06 (0.93–1.2)						
Modesty	0.94 (0.8–1.1)						
Discrimination in Healthcare	0.81[b] (0.7–0.95)	0.85 (0.7–1.0)					0.96 (0.76–1.2)
PMIR - Punishing Allah Reappraisal	0.84[b] (0.75–0.94)		0.87[c] (0.77–1.0)				0.94 (0.8–1.1)
Fatalism							
Modified Powe	0.84[c] (0.72–0.98)			0.87 (0.73–1.0)			0.88 (0.72–1.1)
RHFQ - Divine Provision	0.86[b] (0.77–0.96)					0.9 (0.76–1.0)	0.96 (0.8–1.2)
RHFQ - Destined Plan	0.81[b] (0.7–0.95)				0.94 (0.8–1.1)		1 (0.81–1.2)
Characteristics							
Age	1.01 (0.98–1.05)						
Years in the United States							
<10	Reference	Reference	Reference	Reference	Reference	Reference	Reference
11–20	5.5[b] (1.9–16.3)	2.8 (0.72–10.7)	2.5 (0.65–9.4)	3.1 (0.8–12)	2.4 (0.65–9)	1.8 (0.5–7.3)	2.8 (0.63–12.1)
>20	10.7[d] (4.4–25.7)	4.5[b] (1.5–13.2)	3.9[c] (1.2–12.1)	5.2[b] (1.8–15.4)	4.8[b] (1.6–14.3)	4.0[c] (1.3–12.3)	4.7[c] (1.4–16)
Highest level of education							
Less than high school	Reference	Reference	Reference	Reference	Reference	Reference	Reference
High school	2.5[e] (0.9–7)	1.9 (0.50–7.2)	2.4 (0.62–9.3)	2.1 (0.57–7.6)	2.7 (0.65–9)	2.8 (0.72–10.9)	2.2 (0.5–8.6)
Associate's degree	5.1[b] (1.6–16.6)	3.2 (0.73–13.8)	3 (0.62–14.5)	3.3 (0.71–15.6)	4 (0.85–19)	4.1[e] (0.9–19.5)	2.8 (0.6–14)
Bachelor's degree	3.6[c] (1.2–10.6)	2.5 (0.63–10.1)	2 (0.5–8.2)	3.2 (0.75–13.3)	2.4 (0.58–10)	2.0 (0.5–8.6)	2.4 (0.5–12.4)
Advanced degree	3.5[c] (1.1–11.4)	1.8 (0.4–7.9)	1.3 (0.3–5.9)	1.4 (0.33–6.2)	1.5 (0.33–6.7)	1.5 (0.34–6.3)	1.2 (0.23–6.2)
Ethnicity							
South Asian	Reference						

	Unadjusted OR (95% CI)	Adjusted OR (95% CI)					
		Model A	Model B	Model C	Model D	Model E	Model F[a]
African American/Black	0.95 (0.35–2.5)						
Arab/Arab American	0.85 (0.32–2.25)						
Marital status	1.18 (0.53–2.6)						
Insurance status	2.1[e] (1–4.6)	0.94 (0.3–2.8)	1.3 (0.43–3.7)	1 (0.34–3)	1.2 (0.4–3.5)	1.2 (0.4–3.6)	1.3 (0.43–4)
Have a PCP	11.1[d] (5–24.4)	8.0[d] (2.9–22.2)	7.2[d] (2.4–21.8)	6.7[d] (2.3–19.2)	6.9[d] (2.4–20.1)	6.7[d] (2.4–19.3)	7.7[d] (2.5–23.4)

CI indicates confidence interval; OR, odds ratio; PCP, primary care physician; PMIR, Psychological Measure of Islamic Religiousness; RHFQ, Religious Health Fatalism Questionnaire. Multivariate ordered regression models are adjusted for age, duration in the United States, level of educational attainment, knowing someone who has had breast cancer, and having a PCP.

[a] Model E adjusted for identity-based discrimination, Punishing Allah Reappraisal, Modified Powe, RHFQ - Divine Provision, RHFQ - Destined Plan and characteristics significant in bivariate analysis.

[b] p < .01.

[c] p < .05.

[d] p < .001.

[e] p < .1.