Received: 28 May 2015 | Revised: 26 May 2016 | Accepted: 7 July 2016

DOI 10.1002/pon.4216

WILEY

PAPER

Religious beliefs and mammography intention: findings from a qualitative study of a diverse group of American Muslim women

Aasim I. Padela[1,2,3*] | Milkie Vu[1] | Hadiyah Muhammad[1] | Farha Marfani[1] | Saleha Mallick[1] | Monica Peek[2] | Michael T. Quinn[2]

[1] Initiative on Islam and Medicine, Program on Medicine and Religion, The University of Chicago, Chicago, Illinois, USA

[2] Department of Medicine, The University of Chicago, Chicago, Illinois, USA

[3] Comprehensive Cancer Center, The University of Chicago, Chicago, Illinois, USA

Correspondence
Aasim I. Padela, 5841 S. Maryland Avenue MC 5068, Chicago, IL 60637, USA.
Email: apadela@medicine.bsd.uchicago.edu

Abstract

Objective Studies suggest that American Muslim women underutilize mammography. While religion has a strong influence upon Muslim health behaviors, scant research has examined how religion-related beliefs inform Muslim women's intention for mammography. Our study identifies and examines such beliefs.

Methods Muslim women aged 40 years and older sampled from mosques participated in focus groups and individual interviews. Drawing upon the theory of planned behavior, interviews elicited salient behavioral, normative, and control beliefs regarding mammography and the influence of Islam upon screening intention.

Results Fifty women participated in 6 focus groups and 19 in semistructured interviews, with near-equal numbers of African American, South Asian, and Arab Muslims. Forty-two percent of participants had not had a mammogram within the past 2 years. Across differences in race/ethnicity and mammography status, women voiced four religion-related salient beliefs that inform mammography intention: (1) the perceived duty to care for one's health, (2) religious practices as methods of disease prevention, (3) fatalistic notions about health, and (4) comfort with gender concordant health care.

Conclusions Religious beliefs influence decisions to pursue mammography across the ethnic/racial diversity of Muslim women. Notions about duty to God and the stewardship of one's body appear to enhance mammography intention. Theocentric notions of cure and illness and varied views regarding personal agency also inform decisional frames that impact mammography intention. Given the salience of religion among our participants, religiously tailored messages in interventions have the potential to enhance cancer screening.

KEYWORDS

breast cancer screening, cancer, fatalism, Islam, oncology, theory of planned behavior

1 | INTRODUCTION

Regular screening mammography is an effective tool for breast cancer control as increased mammography utilization has contributed to the recent decline in cancer mortality.[1–3] Yet despite these gains, a disproportionate burden of breast cancer mortality and low mammography rates persist among minorities,[4,5] including American Muslims.[6–8]

American Muslims number around 7 million persons[9–11] and comprise predominately of African Americans, Arabs, and South Asians.[11,12] While nearly two-thirds are immigrants,[13] 87% are English literate.[14] Although the lack of religious affiliation captured in the US census data and national health surveys precludes national estimates for Muslim mammography rates, community surveys report underutilization. Illustratively, a biennial mammography rate of 52% was reported in a study of 207 Muslim women recruited through Chicago community organizations,[7] and our Muslim organization-based survey of 240 women in Chicago found that 37% of the sample had not had a mammogram within the past 2 years.[15] Similarly, a California-based survey of 226 Muslim women found 54% to have received a mammogram in the past 2 years.[6] The lower rates of mammography among

American Muslims coupled with data that suggest that some Muslim ethnic groups present with breast cancer at a younger age, with more advanced disease, and with worse morphological features,[8,16–18] underscore the need for delineating and intervening upon barriers to mammography in this community.

Although knowledge-based and access-related barriers to mammography have been studied among Muslim women,[19–22] the influence of religion-related beliefs upon cancer screening practices is not well understood. Several studies suggest that modesty concerns pose barriers to mammography uptake,[19,21–23] yet others suggest that religious beliefs such as the notion of stewardship of the body might promote cancer screening.[21] While informative, these small qualitative studies largely study Muslim women from a single ethnic group, and most often study immigrants, thereby challenging both the ability to separate religious influences from those of race/ethnicity and to describe experiences related to immigrant status separately from those related to religious identity. Consequently, we sought to identify, within a diverse Muslim sample, salient behavioral, normative, and control beliefs impacting mammography intention and among these beliefs closely examine those related to Islam.

2 | METHODS

2.1 | Theoretical framework

The theory of planned behavior (TPB)[24] provided conceptual frames for interview questions, data codebooks, and qualitative content analyses. The TPB asserts that the most proximate and strongest predictor of behavior is intention. Behavioral intention is informed by: (1) one's overall *attitude* toward the action, including his or her outcome expectations; (2) one's belief that most of the people important to him or her believe that he or she should or should not perform the action (*subjective norm*) and beliefs about those norms; and (3) one's *perceived control* regarding performance of the action.[25] This project sets Islam-related factors within the TPB framework as global beliefs and values that influence mammography intention through more specific behavioral, normative, and control beliefs.

2.2 | Study setting, design, and project team

Set in greater Chicago, home to over 300 000 Muslims[26] with large numbers of Arab, South Asian, and African members[9,27] the study utilized a community-engaged approach and was approved by the University of Chicago Institutional Review Board. A community advisory board composed of individuals who represent the Council of Islamic Organizations of Greater Chicago (CIOGC, a federation of over 60 mosques, Muslim community centers, and social service organizations) and 2 CIOGC member social service organizations, the Arab American Family Services and the Muslim Women Resources Center, provided feedback on study objectives and design, facilitated data collection, and participated in dissemination activities. The academic team consisted of a physician-researcher with expertise in mixed-methods health disparities research and Islamic bioethics, a behavioral scientist, and clinician-researchers with expertise in culturally tailored interventions.

2.3 | Participant sampling and recruitment

2.3.1 | Focus group interviews

We recruited self-identified Muslim, English-speaking women over the age of 40 years from 9 mosques between August 2013 and January 2014. Sites were purposively selected to achieve near-equal representation of Arabs, South Asians, and African Americans, and recruitment primarily took place in-person via recruitment tables at events at mosques.

2.3.2 | Semistructured interviews

Between November 2014 and April 2015, women from the already recruited potential participant pool who did not participate in focus groups were offered the option of participating in interviews. Furthermore, using the same criteria for focus group participants, several additional women were recruited from the mosque sites so as to generate a diverse interviewee pool.

2.4 | Data collection

Focus groups were held at the mosques, lasted 1.5-2 hours, were conducted in English, and moderated by a trained female research assistant. Semistructured interviews lasted 45-90 minutes, were conducted in English by trained female research assistants, and all but one interview was conducted via telephone.

Drawing upon TPB constructs, focus group questions captured mammography experiences and beliefs, with probes eliciting behavioral, normative, and control beliefs regarding mammography. Follow-up questions sought to clarify religious and communal aspects of these beliefs. Two additional domains of inquiry—cancer beliefs and preventive health practices—were also elicited through separate questions. The semistructured interview guide added probes and questions to the focus group guide in order to discuss beliefs emerging from the focus groups in greater depth. Interview guides were initially reviewed by the investigative team to reduce redundancy and enhance clarity, and during data collection, problematic questions were iteratively revised based on participant responses. Participant socio-demographic characteristics, mammography status, and religiosity were obtained prior to focus groups and at the conclusion of semistructured interviews.

2.5 | Data analysis

Interviews were audio-recorded and transcribed verbatim. Two research assistants created an initial codebook using TPB domains and emergent Islamic beliefs and values as tree nodes. Implementing a team-based and framework approach to qualitative coding and data analysis,[28] 4 research assistants coded 1 focus group and coding disagreements were resolved through team-based discussion. Emergent themes were then added to the initial codebook as branch nodes of the TPB-based domains yielding a final codebook. Inter-rater reliability was measured by Cohen's kappa coefficient (κ), and recoding was performed until the $\kappa > 0.8$ for each code. Thereafter, research assistants coded the remaining transcripts independently. During team meetings, interview summaries were reviewed by code, and codes were grouped into higher-order conceptual themes based on team

consensus. NViVo 10 software was used to facilitate data analysis.[29] A particular belief was termed salient if it was discussed during 3 or more focus groups, and a theme was categorized as dominant when it was discussed by half or more participants in a focus group. A belief was defined as religion related if participants mentioned that it was informed by God, religious texts, or religious teachings.

3 | RESULTS

Of the 122 individuals recruited, 77 confirmed availability to attend focus group sessions, but 50 participants eventually participated in 6 focus groups. Nineteen women participated in individual interviews. In total, there was nearly equal numbers of Arab (19), South Asian (25), and African American (20) participants. Twenty-nine participants (42%) did not have a mammogram within the past 2 years (Tables 1 and 2).

Eighteen themes were classified as salient and 13 as dominant (Figure 1 and Table S1). Four beliefs were religion related: (1) the perceived duty to care for one's health, (2) methods of disease prevention, (3) fatalistic notions about health, and (4) the comfort with gender concordant health care (Figure 1 and Table S1).

3.1 | Perceived duty to care for one's health

During discussions about preventative health and about mammography, participants reported a religious duty to care for their body. A focus group participant noted "Allah says you have to take care of yourself," and an interviewee explained "God gave us the responsibility of taking care of the body that He gave us." Participants explained that they must demonstrate care for their body before they can expect God's help as a focus group participant shared "God will not help you until you help yourself. So in order for God to do His work, you should do your work first."

In explaining the duty towards bodily stewardship, women utilized two interrelated concepts—the idea of the body as a loan from God and as a trust from God. As a focus group, participant related "we should really be taking care of ourselves and our body because that's – it's a loan from Allah…we have to return it too." An interviewee expounded "we are responsible for our bodies and if we don't take proper care of it, if we neglect it, if we abuse it, if we do things to harm it, then we will be accountable on the Day of Judgment."

Participants also explained the obligation to care for their body through the idea that health is a trust from God. To describe this trust, women referenced the concept of *amana*, an Islamic ethical concept sourced within many different Quranic verses (23:8, 4:58) and Prophetic narrations. As one focus group participant explained "it's [in] the hadith (Prophetic statements) telling us to take care of ourselves." Another focus group participant detailed, "Allah does not tell you not to take care of yourself. You know something we call *amana* which is… if someone gives you like a gift or something you take care of it. You don't… just say, okay, I'm sitting here." Another focus group participant succinctly stated "health is an *amana*."

This belief that one is religiously obligated to care for the body appeared to motivate preventive health actions, including mammography. One interviewee explained "our religion always calls for awareness, taking care of yourself…you do [mammograms] for your body for you, for something good."

3.2 | Methods of disease prevention

Participants offered examples of behaviors to prevent illness and maintain health such as diet control, exercise, taking medication, and visiting the doctor to obtain referrals for or undergo screening tests, including mammography. In addition, religious practices, such as prayer and fasting, were believed to be health promoting, illness preventing, and even curative. "I pray regularly even if I go to the doctor, asking for good health – that's one, number one in the list [of prevention actions]" stated one focus group participant. An interviewee discussed how the 5 obligatory daily prayers assist with health, "I feel it cleans my heart and it is a very good exercise."

Another individual interviewee noted that before getting her mammogram, she turned to prayer as a means of prevention and comfort "I was just praying for myself that, please God, keep me healthy." A focus group participant shared her belief that it was prayer that changed her fate, "[the] tests just came back negative, because I prayed on it."

3.3 | Fatalistic notions about health

A complex and variable picture of personal agency in the context of God's decree resulting in disease and cure was shared by participants. At one end, there was almost no perceived personal agency in light of God's decree and individuals declined from pursuing preventative health activities such as mammography. Most participants spoke about this tendency among the community in a disapproving fashion. One focus group participant relayed, "[Other Muslims] put all their faith in God and feel that they don't have to do anything," and an individual interviewee shared that she debates with people who say "I don't go [for screening tests]…it's just with Allah whatever happens, happens. We are all going to die someday" by saying "we are all going to die, I agree…but the quality of life until you die, how is it going to be?" Other participants reflected that God's control over disease impacted their own mammography decisions, as an interviewee said "God is not going to give you something that's not written. So me not taking [mammograms] it is not going to prevent anything from happening because if it's meant, then it's meant to be." An interviewee explained the reason why she did not get a mammogram saying "Allah will[s] what is destined will be…If I don't have any reason to dig into anything, I'll continue to pray for good health…if that's [cancer] is His will then it will be."

With respect to prayer influencing God's decree regarding illness, some participants noted that prayer was a legitimate means to access cure from God and others explained that prayer could forestall illness. Yet, in contrast, the view that "[prayer] doesn't prevent you from getting sick because if God wants to get you sick, you're going to get sick" was also mentioned.

Seeking to balance notions of God's decree and personal responsibility to obtain health care, one interviewee shared "everything is in the hands of God…however we don't know what His plans are and therefore we follow His rule which says to seek treatment." Another

TABLE 1 Participant Characteristics

Characteristic	Focus Group (N = 50)	Individual Interviews (N = 19)
	No., %	No., %
I. Socio-demographic information		
Racial/ethnic background	N = 50	N = 18
African American/Black	16 (32.0)	3 (16.7)
South Asian	16 (32.0)	9 (50.0)
Arab/Arab American	14 (28.0)	6 (33.3)
Age, y	N = 50	N = 18
40-49	21 (42.0)	11 (61.1)
50-74	28 (56.0)	7 (38.9)
Mean (range)	51 (range: 40-75)	45 (range: 41-67)
Marital status	N = 46	N = 19
Married	38 (82.6)	17 (89.5)
Highest level of education	N = 45	N = 19
High school/General Education Development or less	8 (17.8)	4 (21.1)
Associates	11 (24.4)	3 (15.8)
Bachelors	18 (40.0)	7 (36.8)
Advanced degree (Masters or higher)	8 (17.8)	5 (26.3)
Immigrant status	N = 50	
Immigrated as adult	28 (56.0)	
Born in the USA	15 (30.0)	
Immigrated as child	7 (14.0)	
Duration in the USA		N = 19
Less than 15 y		3 (15.8)
16-20 y		3 (15.8)
More than 20 y		13 (68.4)
Annual household income	N = 44	
Less than $50 000	18 (41.0)	
$50 001-$100 000	14 (31.8)	
Over $100 001	7 (15.9)	
Annual household income		N = 16
Less than $60 000		7 (43.8)
$60 000-$90 000		6 (37.5)
Over $90 001		3 (18.8)
II. Health services utilization		
Have primary care physician	N = 50	N = 19
	47 (94.0)	19 (100)
Have had a clinical breast exam	N = 50	N = 19
	42 (84.0)	18 (94.7)
Have had a mammogram ever	N = 50	N = 19
	37 (74.0)	14 (73.7)
Mammogram within the last 2 y	28 (56.0)	12 (63.2)
III. Religiosity		
Islamic affiliation	N = 50	N = 19
Sunni	37 (74.0)	15 (78.9)
Rating of religiosity (on 1-10 scale)	N = 43	N = 18
5 (Somewhat religious)	6 (14.0)	2 (11.1)
6	4 (9.3)	2 (11.1)
7	4 (9.3)	7 (38.9)
8	15 (34.9)	3 (16.7)

(*Continues*)

TABLE 1 (Continued)

Characteristic	Focus Group (N = 50)	Individual Interviews (N = 19)
	No., %	No., %
9	5 (11.6)	1 (5.6)
10 (Very religious)	8 (18.6)	3 (16.7)
Wear Hijab	N = 46	N = 19
Yes	36 (78.3)	18 (94.7)

TABLE 2 Self-reported ethnicity by focus group location

Focus Group	Number of Participants	Self-reported Ethnicity			
		African American/Black	South Asian	Arab/Arab American	Other
Islamic Foundation	8		6		2
Masjid Al-Ihsan	7	7			
Orland Park Prayer Center	8			8	
Mosque Foundation	8			6	2
Muslim Education Center	10		10		
Nigerian Islamic Association	9	9			

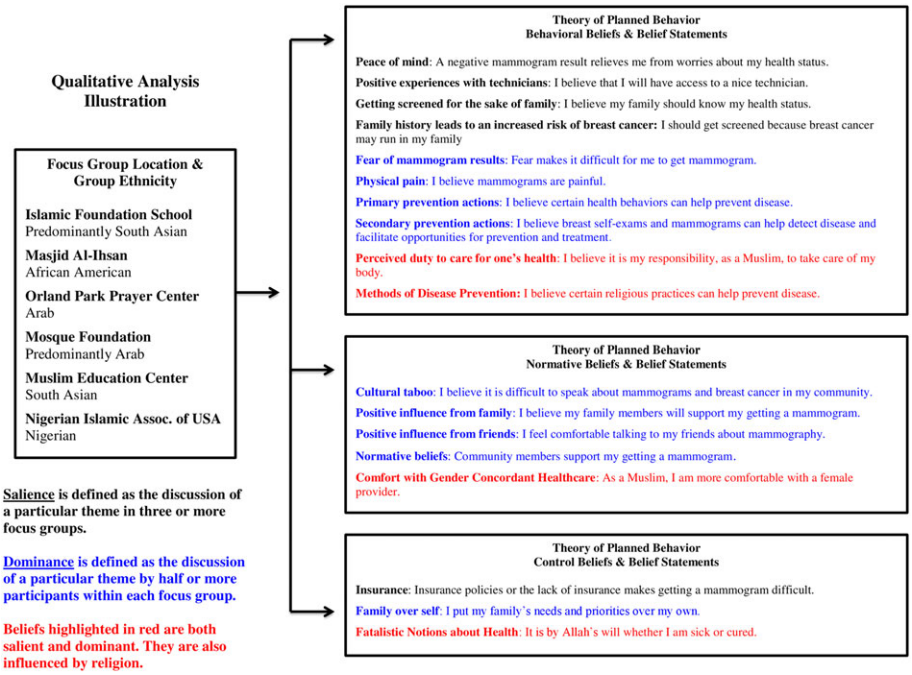

FIGURE 1 Prevalent Themes from Qualitative Analyses as Mapped onto the Theory of Planned Behavior

interviewee explained that while "everything is preordained by God but He doesn't choose for you. You choose for yourself but He just knows what you are going to choose," and another interviewee expounded that one's choices determine illness "it's not because God from the beginning wanted you to get it, it might be your lifestyle." Another interviewee shared that her decision to get a mammogram was also part of providential design explaining "it was Allah that steered me to have the test on whatever particular day and time in my life and in him I put my trust for whatever the outcome or the result will be…whatever Allah has decreed for you, he has decreed for you." These sorts of understanding of God's decree left room for personal agency and appeared to facilitate mammography screening.

In summary, many ideas emerged from the participants relating God's decree, personal agency, and health care decisions. For some participants, mammography was unnecessary in light of God's decree, others noted that one could petition God (through prayer) such that cancer was not fated for that person, others felt motivated to obtain screening based on their understanding of duty to God, while some participants voiced multiple perspectives at the same time.

3.4 | Comfort with gender concordant health care

Many women discussed their preference for female health care providers including doctors and mammography technicians. A focus group participant said, "Well, if somebody is going to do a breast exam on me I'd really prefer a female..." Another focus group participant noted that gender concordance informs all her health care-seeking actions, including mammography saying "If I went in there and I found out it was

going to be male physician, I'll probably just walk right back out or I'll stay there until they find me somebody who's going to be a [lady]."

The preference for gender concordant care resulted from ideas of physical and social comfort as well as adhering to religious notions of modesty. One focus group participant stated, "If I had a male doctor, I couldn't talk to him. If he's a gynecologist and he asks me certain questions, I'm not comfortable talking about it. Probably if it was a female, I would open up and tell everything." An interviewee shared "yes, because I'm Muslim. They have to be female." Indeed, modesty is a significant Islamic ethic impacting behavior, dress, speech, and one's interaction with God that is sourced within many Quranic verses (eg, 24:30-31) and Prophetic statements.[33] Importantly, the loss of modesty was mentioned as a risk or harm related to clinical breast exams.

4 | DISCUSSION

Our study into the salient behavioral, normative, and control mammography-related beliefs of Muslim women provides critical insight into religious beliefs that influence their cancer screening behaviors. Through focus groups and interviews, and across differences in race/ethnicity and mammography status, participants described (1) a perceived duty to care for one's body, and by extension one's health, because the body represents an entrusted loan from God enhanced women's intention for mammography, the beliefs that (2) religious practices are a credible means of preventing illness and (3) that God's decree results in illness and cure, both variably influenced mammography intention as participants shared multiple perspectives regarding the utility of petitioning God to remain disease free and the usefulness of cancer screening, and (4) comfort with gender concordant health care providers because modesty norms influenced decisions to obtain mammograms. These themes extend findings from previous studies and have significant implications for interventions seeking to increase mammography rates among Muslims.

Our work builds upon the scant literature describing religious influences upon mammography utilization among American Muslims. Shirazi and colleagues studied the breast cancer knowledge of 53 non-English speaking, Muslim Afghan immigrants and report that women viewed "their body as a gift 'they should take care of' " and that viewed "themselves responsible for…seeking medical care and treatment" in light of this trust.[21] While Shirazi and colleagues' sample held that God's decree determined illness and cure they did not voice "religious fatalism regarding health" whereby preventive health measures were seen as unnecessary.[21] Al-Amoudi and colleagues' interview of 14 Somali Muslim women echoes the findings of Shirazi et al[19] Our study corroborates these notions of body stewardship and God's decree as salient and dominant and extends these findings to English-speaking Muslim women from diverse backgrounds. Yet, unlike these studies, some of our participants rationalized their disinclination to seek mammograms on the basis of religious fatalism.[30] On the other hand, our prior surveys in this same community found no association between measures of religious health fatalism and cancer screening rates.[15,31] Hence, our data suggest that Muslim views on God's decree and personal agency do not fully map onto operative definitions of religious fatalism commonly used in the health literature and that more nuanced measures are needed to assess Islamic notions of fatalism. Nonetheless, because God-centric views of health and illness and bodily stewardship were linked to positive intention for mammography, interventions that frame preventive health measures within theologically appropriate religious frameworks may be effective.

Similar to qualitative studies of Somali,[19] Asian,[23] Afghani,[21] and other Muslims'[22] attitudes towards breast cancer screening, our study finds gender concordance and modesty preservation to be highly valued. These beliefs are normative in that they emerge from religious teachings that emphasize the maintaining modesty and detail norms of dress and cross-gender interaction[32] but may also influence control beliefs where women forgo mammograms if they cannot assure same-sex providers. Community-based interventions should highlight that many mammography centers are staffed by women in order to allay modesty concerns and overcome a perceived barrier for some Muslims. At the same time, programs that sensitize health care providers to the critical role modesty and gender concordance play upon Muslim health care-seeking patterns and enhance cross-cultural communication skills can also promote higher quality health care experiences and dispel communal narratives of religious discrimination. A two-pronged approach may particularly be important in Chicago because we previously found perceived religious discrimination in health care to be negatively associated with Muslim mammography rates.[15]

Our participants did *not* voice several themes found by other researchers. Rajaram and colleagues reported that patriarchal beliefs about familial decision making negatively impacted cancer screening among Asian Muslim women,[23] while Shirazi reported similar views in their Afghan sample.[21] Within focus group discussions, none of our participants reported an inability to obtain a mammogram because male relatives controlled decision making, and even after probes were inserted into the semistructured interview guides asking women to comment on such notions, interviewees rejected this view. We hypothesize that participants within our study might not have experienced similar controlling influences over cancer screening in part because of acculturation. In other words, as individuals of both genders acculturate to the individualistic nature of American society, patriarchal notions that possibly inform health care-seeking decisions might wane and women no longer perceive a lack of control over their own cancer screening decisions. Indeed, our participants on average had lived in the USA longer than the participants in the 2 aforementioned studies. It is also possible that such controlling influences are not the norm, as larger studies of Arab women living in Qatar and the UAE find that only a very small minority report male relatives objecting to breast cancer screening.[33,34]

While our findings are strengthened by a mosque community-based approach to recruitment, sampling from multiple segments of the Muslim community, involvement of a community advisory board, and a team-based approach to qualitative content analysis, our methodology may limit generalizability. The recruitment strategy introduces selection bias towards Muslims for whom religious influences upon health behaviors are more prominent. Similarly, restricting participants to those who are English proficient biases our sample against non–English-speaking populations. However, because nearly 50% of American Muslims (inclusive of men and women) attend mosque once a week,[14] and 87% of American Muslims (inclusive of men and women)

are English literate,[14] we believe that our work legitimately represents the voices of a large cross section of American Muslim women. Our interview guides did not elicit personal immigration histories nor delved into political circumstances informing health choices; further research is needed to assess the relative weight of these and other beliefs and factors that impact cancer screening among Muslims.

Given the salience of religion among our diverse Muslim participants and that previous studies have also noted similar religious influences to inform screening practices among different racial/ethnic subgroups of Muslims, incorporating religiously tailored messages in cancer screening interventions has the potential for broad impact. As described earlier, complex theocentric notions of illness were juxtaposed with varied views on personal agency as related to cancer prevention, and discussions about duty to God and stewardship of one's body dovetailed into conversations about the utility of religious practices for prevention. These ideas must be engaged with in order to enhance cancer screening in this community. Successfully addressing these beliefs requires partnering with Islamic scholars and Imams in a two-way dialogue where behavioral interventionalists come to understand Islamic doctrine and ethics while religious leaders gain literacy in the theory and practice of health behavior change. Other faith communities have successfully initiated such cooperative intervention programs.[35] Muslim groups should adapt these models and utilize our research upon Muslim women's cancer screening behaviors and the role of Imams in community health as foundational to such efforts.[15,31,36]

ACKNOWLEDGMENTS

A Mentored Research Scholar grant (MRSG-14-032-01-CPPB) to AIP, in addition to an Institutional Research grant (#58-004) from the American Cancer Society (ACS) provided project funds and supported the time effort of AIP, HM, FM, SM, and MV. A National Cancer Institute Cancer Center support grant (#P30 CA14599) provided additional project funds. We acknowledge the critical assistance of community partners: Mohammad Kaiseruddin from the CIOGC, Itedal Shelabi from Arab American Family Services, Sima Qureshi from Muslim Women's Resource Center, Sahira Rahman from Islamic Foundation School, Imam Madyun and Tahira Madyun from Masjid Al-Ihsan, Ali Tai and Tayyaba Ahmad from Muslim Education Center, Aisheh Said from Mosque Foundation, Ghada Rafati from Orland Park Prayer Center, and Rukiyat Lawal and Shaffdeen A. Amuwo from the Nigerian Islamic Association. We also thank our research interns Caitlin Ajax, Alia Azmat, Tasmiha Khan, and Hinasahar Muneerudin for their invaluable assistance with many aspects of the project. We also thank Dr. Funmi Olopade for her institutional and intellectual support.

REFERENCES

1. American Cancer Society. American Cancer Society guidelines for the early detection of cancer. 2014. http://www.cancer.org/healthy/findcancerearly/cancerscreeningguidelines/american-cancer-society-guidelines-for-the-early-detection-of-cancer. Accessed January 12, 2016
2. Nelson HD, Tyne K, Naik A, Bougatsos C, Chan BK, Humphrey L. Screening for breast cancer: an update for the U.S. Preventive Services Task Force. *Ann Intern Med*. 2009;151(10):727–737. doi: 10.7326/0003-4819-151-10-200911170-00009
3. Pace LE, Keating NL. A systematic assessment of benefits and risks to guide breast cancer screening decisions. *JAMA*. 2014;311(13):1327–1335. doi: 10.1001/jama.2014.1398.
4. Peek ME, Han JH. Disparities in screening mammography: current status, interventions, and implications. *J Gen Intern Med*. 2004;19(2):184–194. doi: 10.1111/j.1525-1497.2004.30254.x
5. Miller JW, King JB, Joseph DA, Richardson LC. Breast cancer screening among adult women—Behavioral Risk Factor Surveillance System, United States, 2010. *MMWR Morb Mortal Wkly Rep [Internet]*. 2012;61(2):46–50. Available from: http://www.ncbi.nlm.nih.gov/pubmed/22695463%2C22701565%2C22701573?dopt=Citation.
6. Shaheen MA, Galal OM, Salahi L, Aman Y. Utilization of mammography among Muslim women in Southern California [Abstract]. 2005. https://apha.confex.com/apha/133am/techprogram/paper_106236.htm. Accessed July 25, 2016.
7. Hasnain M, Menon U, Ferrans CE, Szalacha L. Breast cancer screening practices among first-generation immigrant Muslim women. *J Women's Heal*. 2014;23(7):602–612. doi: 10.1089/jwh.2013.456910.1089/jwh.2013.4569
8. Hensley Alford S, Schwartz K, Soliman A, Johnson CC, Gruber SB, Merajver SD. Breast cancer characteristics at diagnosis and survival among Arab-American women compared to European- and African-American women. *Breast Cancer Res Treat*. 2009;114(2):339–346. doi: 10.1007/s10549-008-9999-z
9. Ba-Yunus I. *Muslims of Illinois: A Demographic Report*. Chicago: East-West Review;1997.
10. Smith TW. The Muslim population of the United States: the methodology of estimates. *Public Opin Q*. 2002;66(3): 404:417 . http://www.jstor.org/stable/3078769
11. Muslim American Demographic Facts. http://www.allied-media.com/AM/. Accessed July 10, 2009.
12. Gallup, Inc. Muslim Americans: a national portrait—an in-depth analysis of America's most diverse religious community. Washington D.C. 2009. http://www.themosqueinmorgantown.com/pdfs/GallupAmericanMuslimReport.pdf. Accessed July 25, 2016.
13. Pew Research Center. Muslim Americans: middle class and mostly mainstream. Washington, DC; 2007. http://www.pewresearch.org/files/old-assets/pdf/muslim-americans.pdf. Accessed July 25, 2016.
14. Pew Research Center. Muslim Americans: no signs of growth in alienation or support for extremism. Washington D.C. 2011. http://www.people-press.org/files/legacy-pdf/Muslim%20American%20Report%2010-02-12%20fix.pdf
15. Padela AI, Murrar S, Adviento B, et al. Associations between religion-related factors and breast cancer screening among American Muslims. *J Immigr Minor Health*. 2015;17(3):660–669. doi: 10.1007/s10903-014-0014-y
16. Kakarala M, Rozek L, Cote M, Liyanage S, Brenner DE. Breast cancer histology and receptor status characterization in Asian Indian and Pakistani women in the U.S.—a SEER analysis. *BMC Cancer*. 2010;10:191. doi: 10.1186/1471-2407-10-191
17. Nasseri K, Moulton LH. Patterns of death in the first and second generation immigrants from selected Middle Eastern countries in California. *J Immigr Minor Health*. 2011;13(2):361–370. doi: 10.1007/s10903-009-9270-7
18. Moran MS, Gonsalves L, Goss DM, Ma S. Breast cancers in U.S. residing Indian-Pakistani versus non-Hispanic White women: comparative analysis of clinical-pathologic features, treatment, and survival. *Breast Cancer Res Treat*. 2011;128(2):543–551. doi: 10.1007/s10549-011-1362-0
19. Al-Amoudi S, Cañas J, Hohl SD, Distelhorst SR, Thompson B. Breaking the silence: breast cancer knowledge and beliefs among Somali Muslim women in Seattle, Washington. *Health Care Women Int*. 2015;36(5):608–616. doi: 10.1080/07399332.2013.857323
20. Salman KF. Health beliefs and practices related to cancer screening among Arab Muslim women in an urban community. *Health Care Women Int*. 2012;33(1):45–74. doi: 10.1080/07399332.2011.610536

21. Shirazi M, Bloom J, Shirazi A, Popal R. Afghan immigrant women's knowledge and behaviors around breast cancer screening. *Psychooncology*. 2013;22(8):1705–1717. doi: 10.1002/pon.3216
22. Underwood SM, Shaikha L, Bakr D. Veiled yet vulnerable: breast cancer screening and the Muslim way of life. *Cancer Pract*. 1999;7(6):285–290. doi: 10.1046/j.1523-5394.1999.76004.x
23. Rajaram SS, Rashidi A. Asian-Islamic women and breast cancer screening: a socio-cultural analysis. *Women Health*. 1999;28(3):45–58. doi: 10.1300/J013v28n03_04
24. Ajzen I. Behavioral interventions: design and evaluation guided by the theory of planned behavior. In: Mark MM, Donaldson, S., Campbell B, eds. *Social Psychology and Evaluation*.2011:74–101.
25. Ajzen I. The theory of planned behavior. *Organ Behav Hum Decis Process*. 1991;50(2):179–211. doi: 10.1016/0749-5978(91)90020-T
26. Chicago Muslims: Deep roots, many branches IIP Digital 2014. Available from: http://iipdigital.usembassy.gov/st/english/publication/2013/11/20131104285728.html#axzz3atiKpc7e. [Date of access: January 12, 2016].
27. Logan JR. America's newcomers. 2003. http://mumford.albany.edu/census/NewComersReport/NewComer01.htm. Accessed: January 12, 2016.
28. MacQueen KM, McLellan E, Kay K, Milstein B. Codebook development for team-based qualitative analysis. *Field Methods*. 1998;21(2):31–36. doi: 10.1177/1525822X980100020301
29. Ltd QIP. *NVivo Qualitative Data Analysis Software*. 2012.
30. Franklin MD, Schlundt DG, Wallston KA. Development and validation of a religious health fatalism measure for the African-American faith community. *J Health Psychol*. 2008;13(3):323–335. doi: 10.1177/1359105307088137
31. Padela AI, Peek ME, Johnson-Agbakwu CE, Hosseinian Z, Curlin F. Associations between religion-related factors and cervical cancer screening among Muslims in greater Chicago. *J Low Genit Tract Dis*. 2014;18(4):326–332. doi: 10.1097/LGT.0000000000000026
32. Padela AI, del Pozo P. R. Muslim patients and cross-gender interactions in medicine: an Islamic bioethical perspective. *J Med Ethics*. 2011;37(1):40–44. doi: 10.1136/jme.2010.037614
33. Bener A, El Ayoubi HR, Moore MA, Basha B, Joseph S, Chouchane L. Do we need to maximise the breast cancer screening awareness? Experience with an endogamous society with high fertility. *Asian Pac J Cancer Prev*. 2009 Oct-Dec;10(4):599–604.
34. Bener A, Alwash R, Miller CJ, Denic S, Dunn EV. Knowledge, attitudes, and practices related to breast cancer screening: a survey of Arabic women. *J Cancer Educ*. 2001 Winter;16(4):215–220.
35. Erwin DO, Spatz TS, Turturro CL. Development of an African-American role model intervention to increase breast self-examination and mammography. *J Cancer Educ*. 1992;7(4):311–319.
36. Padela AI, Killawi A, Heisler M, Demonner S, Fetters MD. The role of imams in American Muslim health: perspectives of Muslim community leaders in Southeast Michigan. *J Relig Health*. 2011;50(2):359–373.

SUPPORTING INFORMATION

Additional Supporting Information may be found online in the supporting information tab for this article.

How to cite this article: Padela, A. I., Vu, M., Muhammad, H., Marfani, F., Mallick, S., Peek, M., and Quinn, M. T. (2016), Religious beliefs and mammography intention: findings from a qualitative study of a diverse group of American Muslim women, *Psycho-Oncology*, doi: 10.1002/pon.4216