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Breast cancer beliefs and screening behaviors among South Asian immigrant women living in the United States

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Abstract

Background Breast cancer incidence is increasing among South Asian women in the United States (US). This qualitative study explored breast cancer beliefs, behaviors, and experiences among South Asian immigrant women in New Jersey (NJ).

Methods We conducted four online focus groups with South Asian women from NJ, aged ≥ 25 years with no prior history of cancer, in English, between June 2021 and July 2022. Thematic content analysis was guided by the Social Contextual Framework.

Results We recruited 22 participants, average age 52 (standard deviation (SD) = 8.4) years, all born in South Asia, and living in the US for an average of 26 (SD = 11.7) years. Low perceived individual risk of breast cancer was influenced by no family history and healthy lifestyles. Despite diet changes since immigrating and misconceptions held by some, women understood the benefits of mammography. Interpersonal and cultural barriers included family responsibilities and norms deprioritizing women's health and health-seeking behaviors. Access to care may be limited by structural factors including immigration status, insurance, and language barriers. Social norms regarding stigma, modesty, and self-disclosure may vary by generation and context.

Conclusions Despite low perceived breast cancer risk and some cultural and structural barriers to screening, South Asian immigrant women generally understood mammography's early detection benefits. Culturally appropriate interventions leveraging family ties and social networks are needed to dispel misconceptions, promote health-seeking behaviors, and address structural barriers.

Keywords Breast cancer screening, South Asian, Immigrant health, Social context

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Background

Breast cancer is the most common cancer among women living in the United States (US) and the second leading cause of cancer death [1]. Nationwide, breast cancer incidence rates are increasing among South Asian American women (with origins in Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka), even as rates decline among non-Hispanic White women [2, 3]. Further, South Asian American women are more likely to be diagnosed at a younger age with more advanced breast cancer compared to non-Hispanic White women [4–6]. However, data on breast health and mammography screening uptake of South Asian American women are sparse. This data gap has been attributed to aggregation of multiple Asian subgroups into a single Asian category in several research studies and limited engagement of South Asian American community members in breast cancer studies [7].

US surveys, which aggregate multiple Asian subgroups, estimate that 65-76% of Asian women received a mammogram in the last two years, falling short of the *Healthy People 2020* goal to screen 81% of women aged 50–74 years [1, 8, 9]. From 2008 to 2015, screening among Asian women declined 13% points [10]. These issues and the heterogeneity among Asian subgroups in breast cancer incidence and mortality underscore the need for additional data on factors influencing breast cancer outcomes and the uptake of screening in distinct Asian subgroups [2, 11, 12]. Further, available studies indicate a wide range of screening rates that suggest inconsistencies in the data. A few studies indicate that sociodemographic factors influence breast cancer screening among South Asian American women. For example, those who are uninsured, unemployed, have less education, or are non-citizens have lower mammography screening rates, ranging from 35 to 75% [13, 14]. The few studies investigating social and cultural factors such as perceptions of mammography, acculturation, length of residency in the US, and English language preference have produced inconsistent findings regarding screening behaviors, with rates varying between 32.8% and 81.2% [14, 15]. The lack of data on social contextual factors influencing screening behavior is compounded by the fact that the South Asian population has grown considerably in the US, increasing by over 62% between 2010 and 2020 [16, 17].

The expanding South Asian American population, coupled with these gaps, underscores the need for a better understanding of South Asian American women's attitudes and beliefs about breast cancer. This knowledge is vital for developing culturally appropriate strategies to enhance breast health behaviors and ultimately outcomes. To address this, we established a research initiative to explore and understand perceptions and beliefs regarding breast cancer risk, breast cancer screening, and factors influencing screening experiences of South Asian American women. In this paper, we present a qualitative analysis of focus group discussions with South Asian American women without a prior diagnosis of breast cancer.

Methods

Study setting

This study was conducted in New Jersey (NJ), home to over 1 million Asians with South Asians comprising 49% of the state's Asian population [18]. Representing around 5% of NJ's population, South Asians are the state's largest and fastest growing Asian subgroup [18, 19].

Study design and recruitment

The South Asian Breast Cancer (SABCa) study had three components: [1] focus group discussions with South Asian American women having no prior diagnosis of cancer; [2] focus group discussions with South Asian American breast cancer survivors; and [3] structured interviews with health care professionals providing breast cancer early detection or disease management to South Asian Americans. This paper focuses on the first component where we conducted 4 virtual focus groups (FGs) between June 2021 and July 2022 consisting of 5–7 participants per FG. In-person discussions were not possible due to COVID-19 policies. We recruited South Asian women across NJ to study breast cancer perceptions and experiences, as previously described [20]. Briefly, we advertised broadly with community connections, including religious organizations, local health departments, health advocacy organizations, and cultural media outlets (e.g., radio station). We also participated in a radio talk show about breast cancer, where we detailed the study. Interested adult women were screened for eligibility via phone by research staff. Inclusion criteria included self-identifying as South Asian, female, age $\geq$ 25 years, no history of any cancer, ability to read and speak English, and having access to a computer with internet access. This paper follows the consolidated criteria for reporting qualitative research (COREQ) [21].

Theoretical frameworks

Data collection and analysis were informed by the Health Belief Model (HBM), which is widely used to explain cancer screening values and beliefs [22]. According to the HBM, perceived threat (perceptions regarding susceptibility of developing breast cancer and severity of the disease), and perceived benefits of taking action to avoid the disease, influence readiness to act [22, 23]. Additional constructs including perceived barriers, cues to action, and self-efficacy also influence screening behavior [24]. As HBM focuses on individual-level factors of behavior, we also used the Social Contextual Framework to examine contextual factors across multiple ecological levels of influence [25, 26]. Thus, we explored how interpersonal, health care organization, social and cultural factors make up the social context that also influence breast cancer behaviors among South Asian immigrant women. We used both theoretical frameworks and constructs in developing the interview guide and analyzing themes to help explore and understand how beliefs and experiences related to breast cancer influence screening, including mammograms and clinical breast exams (CBEs). Our exploration also covered perceptions of diet and physical activity in relation to breast cancer beliefs and behavior.

Data collection

We obtained demographic characteristics from participants through a brief intake survey prior to the FG. The online FGs were conducted via a HIPAA compliant platform. All FGs were moderated by the female principal investigator (JMS), who identifies as South Asian and has experience in cancer biostatistics and epidemiology research and training in science communication. The moderator guide was informed by the theoretical frameworks and developed by a team of cancer control researchers with extensive qualitative experience. The guide began with broad questions about breast cancer, then progressed to more specific topics such as perceptions of risk and severity, screening behavior, beliefs about benefits of screening and treatments, and interpersonal communication and motivations (Table 1). Participants were encouraged to answer the moderator's questions individually and also talk with each other to explore both individual and shared perspectives. FGs were conducted iteratively, so the guide was adapted with additional questions to explore emergent themes as appropriate.

FG sessions lasted 83 min on average with a mean 15.6 min of engagement per participant. The discussions were digitally recorded and professionally transcribed. Notes were taken by a female South Asian researcher (TD) with experience in public health social science research. To ensure accuracy, both moderator and notetaker reviewed the transcripts against the audio recordings and notes.

Each participant received up to $100 in electronic gift cards - $25 upon completing the brief intake survey and $75 upon completing the FG.

Data analysis

We used the Atlas.ti 23 software (Berlin, Germany) to facilitate data management, coding, and iterative thematic analysis. Preliminary codes and definitions were based on the broad question topics in the guide. Transcripts were reviewed line by line by a subset of the female study team to develop and refine codes for additional themes emerging from the data. All transcripts were independently coded by two public health trained qualitative analysts (MM and JT) who did not participate in data collection. Summaries of preliminary themes were written for each code within and across FGs, which also facilitated counts of specific event mentions and negative case analysis. Summaries and interpretations were discussed during regular meetings between study team members. Patterns were synthesized and corroborated as part of the Immersion-Crystallization approach, paying attention to reflexivity of individuals and the team to enhance rigor [27, 28]. As we synthesized the findings, we used the social contextual framework to help organize themes by ecological level.

Results

Participant characteristics

The total sample size was 22 participants (Table 2). The number of participants in the four FGs were 5, 4, 6, and 7, respectively. Participants in FG1 were younger than

Table 1 Focus group moderator guide topics and example questions

Topic	Questions
Breast cancer beliefs and attitudes	What comes to mind when I mention the word breast cancer?
	Why do you think a person gets breast cancer?
	If one of your close relatives had breast cancer, do you think they would tell you?
Health communication, motivation, and decision-making	How is personal health history or health concerns communicated in your family?
	How are decisions about lifestyles such as eating habits and exercises made in your family?
	How are medical decisions such as treatment for illness, health screening for disease prevention or annual health examination made in your family?
Risk factor knowledge and perceptions of severity	Please tell me what influences breast cancer risk. In what ways?
	What do you know about the relationship between breast feeding and breast cancer?
	What do you know about breast cancer being passed down through families?
Perceived barriers and benefits of screening and treatment	If you were recommended a mammogram by a physician, would you undergo it? If "no", why not?
	What difficulties or challenges, if any, have you encountered in getting breast examination, mammography?
	What challenges might South Asian women encounter in getting breast exam, mammography?
	What do you think about breast cancer being cured?

Table 2 Characteristics of South Asian women participating in focus groups

Characteristic	***N* (%)** **22 (100%)**
Age	
39–49 years	9 (40.9)
50–59 years	9 (40.9)
60–75 years	4 (18.2)
Education	
College or some college	7 (31.8)
Master's	12 (54.5)
Doctoral or Professional degree	3 (13.6)
Employment	
Private	11 (50.0)
Self-employed	5 (22.7)
Government	3 (13.6)
Homemaker	3 (13.6)
Health insurance source	
Employer-sponsored	18 (81.8)
Medicare	4 (18.2)
Languages spoken other than English	
Hindi	20 (90.9)
Gujarati	8 (36.4)
Tamil	6 (27.3)
Telugu	4 (18.2)
Other (Marathi, Kutchi, Urdu, Malayalam, Punjabi)	8 (36.4)
Language spoken with friends	
South Asian and English equally	12 (54.5)
More or only English	7 (31.8)
More or only South Asian	3 (13.6)
Preferred language for media programming	
South Asian and English equally	10 (45.5)
More or only English	7 (31.8)
More or only South Asian	5 (22.7)
Years lived in the U.S. Mean (SD), [Range]	26.0 (11.7), [5–51]
Study recruitment method	
Community outreach and radio advertising	10 (45.5)
Cooperative Extension programming	7 (31.8)
Snowball	5 (22.7)

Notes: SD, standard deviation

other groups (mean age 46 years) compared to the mean age across all FGs (52 years, SD = 8.4 years). Other demographic characteristics were similar across FGs. Except for one woman who refused to disclose marital status, all participants were married. Most (68%) were highly educated and had a graduate degree. All of the participants were born in India or Pakistan and had lived in the US for 26 years on average (SD = 11.7 years). In addition to English, most (91%) spoke Hindi. Approximately half spoke English and a South Asian language equally with friends, though 23% preferred more or only South Asian language media programming. All participants were interested in or had undergone mammography screening. Only one reported a family history of breast cancer through her maternal aunt.

Social contextual factors influencing breast cancer beliefs and behaviors

Below, we describe the psychosocial and social contextual themes that emerged within and across the social ecological levels according to theoretical constructs (Fig. 1). Example quotes by construct are also displayed in text.

Individual level: Cancer-related psychosocial factors

Participants expressed fear as a key emotion regarding breast cancer, suggesting a heightened perceived severity. At least one woman in each FG described breast cancer with negative words such as "life-threatening" and "scary", usually when discussing side effects of chemotherapy and surgery. In fact, two participants who had previously screened shared how scared they were when something abnormal was detected during CBE and were now very conscientious about attending mammography screening. One explained her experience having a biopsy, which left her worried about the possibility of the lump developing into something more severe.

> *FG1: I was going for my routine checkup, and she was able to find a lump in my right breast [...] And then she said, okay, let's go for biopsy and find out whether it's non – I forgot the term. Whether it's cancer or a non-cancer related lump. So, then I got the biopsy done, and it basically came out that it's not cancer related, it just a lump.*

However, participants across FGs had low perceived susceptibility of breast cancer. They were aware of the *BRCA* gene and largely understood its hereditary nature. Participants did not believe they faced an increased risk of breast cancer because of lack of family history or genetic predisposition. However, some acknowledged the possibility of a breast cancer diagnosis without having a family history of the disease.

> *FG3: If anybody in your close family members or even distant like cousins or anybody has it, you better think that you are at risk, even if you have screened it yourself. So be careful. Educate yourself to be regular in the mammograms and testing yourself also. [...] If you have somebody in the family, be extra cautious. If you don't, still be cautious.*

Sometimes misconceptions about risk factors were discussed. For example, a couple of women suggested that wearing tight bras could cause breast cancer. One participant shared that a health care provider encouraged not wearing tight bras, especially at night. Participants also

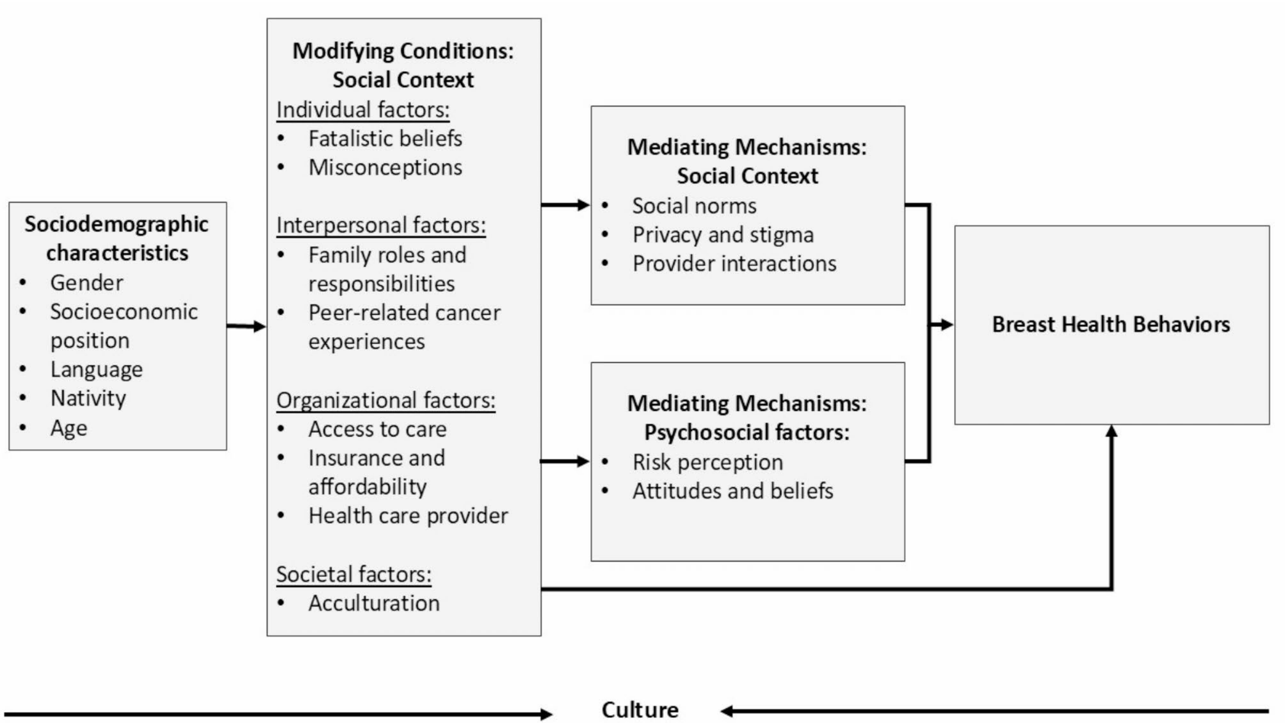

Fig. 1 Application of the social contextual framework

made comparisons that their great grandmothers and grandmothers in India and Pakistan did not wear bras; instead, they wore saris or wrapped their breasts. Some participants noted that breast cancer was not common among their ancestors, attributing this contemporary change – wearing bras – with breast cancer.

> *FG1: You should not wear a bra tight. In the night, you should have a circulation there. You have – that's what I heard when – to prevent it from coming, you have to give a lot of air, not make it tight, and don't wear a tight bra. That's what is important and, at least in the night, you should let it go for seven hours, don't wear bra. That's what I heard from a nurse.*

Confusion and misconceptions about the benefits of breastfeeding came up in multiple FGs. Although participants generally agreed that their mothers or health care providers had told them breastfeeding was beneficial and may reduce risk of breast cancer, they did not understand how or why it helped. Participants in FG1 perceived differences in how breastfeeding is framed in the US compared to India, mainly that breast feeding is emphasized as emotional bonding in India with little mention of breast cancer risk. Additional misconceptions about risk factors (e.g., using deodorant) were also mentioned, but only endorsed by one participant across different FGs.

Others remained unconvinced about causes or risk factors and were concerned it could not be prevented entirely.

> *FG2: But there's no guarantee, even the lifestyle. All you can do is eat healthy, live a healthy lifestyle for yourself. And then hopefully those factors are minimized, but at the end of the day, there's really no known measure to prevent it, that I'm aware of.*

Similarly, a few women expressed reservations and fears about having cancer tests in the event of finding an abnormality. Although many mentioned they follow early detection advice (routine mammograms), they spoke of "other women" who avoid these types of screenings.

> *FG4: They are scared to go and get any kind of tests, any physical thing done, because they are scared if they find something, then what? Then their quality of life will go down. And this way [not testing] – they're not aware. They don't want to know, basically.*

Despite these beliefs, participants were generally optimistic about treatment outcomes after early diagnosis. Participants across FGs understood early detection benefits of screening, and most indicated they conducted self-examinations, received CBEs, and attended mammography. Although most women described self-exams as part of breast health awareness, participants generally explained that they relied more on mammography and CBE as they believed they were more effective:

> *FG2: [I] go get an annual checkup, let him [the doctor] do the test. And like for myself, because I have very dense breasts, I do the ultrasound. Sometimes it's difficult. […] I have to tell myself that I'm doing something to check every year and make sure that if I do have it, I catch it early on. Then I can treat it. But other than that, if I didn't have that, I wouldn't have no way of knowing, right? So, I mean, you can do self- exam, obviously at home, but that's one option, but at least getting a doctor and doing the actual exam has a better probability of finding it and then treating it quickly.*

Interpersonal level: Peer cancer-related experiences

Participants in each of the FGs had increased awareness of breast cancer treatment through diagnoses and experiences of family members and friends. Hearing their peers and personal connections share stories increased participants' knowledge and perceived severity of the disease. For some it motivated and inspired them. One woman shared how knowing a breast cancer survivor, hearing her story of what she endured, and knowing she was cured, helped quell some of her own fears of cancer. Another participant described her experience caring for her mother-in-law being treated for breast cancer. In fact, most considered breast cancer a curable disease.

> *FG1: It's a painful procedure [mastectomy]. Basically, I used to do the dressing for my mother-in-law, too. So, there is sort of puss and blood, which is coming – oozing out. […] I used to do the dressing. And the chemo was really painful. But it is curable. It is curable if you are doing a proper way of treating it, basically. So, it is curable.*

Interpersonal level: family roles and responsibilities

86% of participants worked outside the home. Several women shared how they were busy with work and family responsibilities and therefore did not make time for preventive care, screening, or even self-exams.

Many explained that it was common to prioritize the health of their children and husband before their own. They noted that in South Asian households, the woman is often the driving force for the health of others, making medical decisions for the household and scheduling appointments for the family.

> *FG3: We are so bogged down with work and family and this and that. We always put that [personal health] away, because it's not something that is burning on our head, right. It is like we don't feel pain. We don't feel any. If it's something we have to do we say, 'Okay, not now. Let me get my son's thing done. Let me get my husband's thing done.' So, we are kind of delayed […] we just think, okay, I'll do it another time.*

At least one woman in each FG explained that their family members influenced their health behaviors and medical decisions. Influential family members included sisters, husbands, fathers, and children. Sometimes it was motivational: that an older family member sets a good example, which encourages them to have a healthy lifestyle, or they described how their own children look up to them and will follow their example.

Health care organization level: Access to health care

Despite all the FG participants in our study reporting they had health insurance, they suggested that lacking insurance would be a barrier for other South Asian women. They described situations of friends or family members who had moved to the US "on dependent visas with their husbands" [FG2], making it difficult to obtain insurance coverage.

Finding a good doctor was also problematic because of insurance networks, which required extra effort on the women and/or additional costs. Similarly, being able to access digital mammography services for 2-D or 3-D pictures, which the participants described as being less uncomfortable, came at a cost. Participants thought these better services would likely be unaffordable for some women, especially with no or basic insurance. However, many noted that access to health care was more problematic in India.

Health care organization level: Provider and system interactions

Some women recalled when they first immigrated, language barriers were common in various health care settings. In particular, participants indicated it was difficult to apply for insurance and public programs like Medicaid, which discouraged getting coverage.

> *FG3: A lot of people don't even go – even if they cannot afford the insurance, the New Jersey Medicaid and stuff, they don't know – the language barrier is there for them, the new immigrants especially. If they are not aware of how to apply, there's so much paperwork involved and this and that. They don't want to bother with that. They just go to the doctor when they're in pain.*

In three of the four FGs, participants agreed they would receive a mammogram if recommended by a physician. Despite complaints of pain and discomfort during the imaging procedure, participants believed that staying consistent with mammograms had a better chance of finding any abnormalities early and treating it. One woman spoke positively of the health system reminders helping her adhere to repeat screening:

> *FG2: Actually, one of the things that my doctor does, which I really like, is that when you go for the exam, they actually make you do a self-addressed envelope yourself so that it gets mailed to you*
> *, when your next one is. So that's a reminder to call them.*

Participants described limited breast cancer education and early detection services in their native South Asian countries. In contrast, they gave examples of their doctors and families in the US promoting awareness and teaching about signs and symptoms of breast cancer.

> *FG4: I have two girls, 17 and 22. So their pediatrician [...] just explained to her [daughter] about the healthy way to live and how to check your breasts. So, it is awareness, right? So the child knows: okay this is an important part of my life and I have to take care of it. [...] And we missed that part when we were in India. No one told us about it at 17 years of age to check your own stuff.*

Societal levels: Nativity, acculturation, and access to resources

Participants made multiple comparisons of lifestyle behaviors after immigrating to the US. They expressed concerns regarding the abundance of and easy access to processed, fried, and sweet foods in the US compared to South Asia. Participants noted that an unhealthy diet, sedentary lifestyle, and being overweight or obese were more common in the US, and along with genetics, play a role in breast cancer risk. However, two groups also discussed that despite knowing healthy lifestyle behaviors were important, they were difficult to adopt or adhere to. Similarly, while "not everybody can afford the organic ones" [FG4], "there's so much food available and ready to eat" [FG3], making many unhealthy options easily accessible.

Women in multiple groups talked about how living in the US had changed their diet, including eating more processed food and meat. Despite cultural leanings to a vegetarian diet, these changes were talked about in stark comparison to how they and their ancestors ate in India or Pakistan.

> *FG1: Like my grandmother, we used to grow a lot of vegetables, and it was all organic that we would eat. So, generation through generation – I am a third generation now – and the changes are there. More processed food, more instant food, a lot of chemicals are used into the production of vegetables, or preservatives for fish and meat [...] so those are the things that are basically impacting, somehow, our body.*

Societal levels: Health-seeking social norms

There was considerable discussion that broadly in South Asian culture, and especially among older generations, people have poor preventive health seeking behaviors and often delay seeking medical attention until experiencing serious symptoms or pain. These tendencies were described for women particularly due to deprioritizing their own health. Some explained that it was partly how they were raised – by parents who did not go to the doctor unless they were severely ill. A few participants revealed that some family members and friends still did not get checkups. Specifically, regarding breast cancer, some hinted about norms of older generations avoiding any kind of screening or symptomatic tests, due to fear of diagnosis and some fatalistic beliefs.

> *FG3: Well, because for their generation they didn't have the things we have today. They didn't have a choice, right? If they went to the doctor, and the doctor said you have cancer, they have nothing. They have to go back and curl up in bed and wait to die.*

However, multiple participants described going for annual checkups and one mentioned receiving incentives from insurance companies for completing preventive behaviors.

Societal levels: Modesty, disclosure, and stigma

A few participants suggested that in their home countries in South Asia, women were shy to speak about their breasts or expose them to the doctor, even if the doctor was a woman. And even though they thought breast cancer was becoming less stigmatized in both contexts, they thought some women may be unaware because it was taboo.

> *FG2: I know a lot of people who are not aware of what's going on with their health, even if they have been here many, many years. And like in India, they don't talk about it. I think now maybe they do. But back when I was there, this was all hush-hush.*

We heard mixed opinions about sharing a breast concern or cancer diagnosis with family members, which mainly depended on family situation and age. For example, participants were not inclined to disclose to their relatives in India/Pakistan or to their older family members so as not to worry them. Privacy concerns were considered a common sentiment among older South Asian generations and described as a key difference between South Asia and US. Although some participants thought personal health was not generally discussed, and it was uncommon to "share so many things with friends and family. And our culture is kind of to hide things" [FG1], this was not exclusive to breast cancer. Multiple participants suggested stigmatizing social consequences of being diagnosed and treated for breast cancer. Importantly though, the FG participants indicated they would disclose concerns to their close relatives such as husband, siblings, and children.

Discussion

This qualitative analysis identified factors at various levels – individual, interpersonal, health care organization, and societal – that shape perceptions of breast cancer among South Asian American women without a prior cancer diagnosis. Our analysis reveals both unique and shared findings that provide valuable insights to guide strategies and policies for reducing the breast cancer burden in this rapidly growing demographic group.

At the individual level, women were aware of breast cancer risks, hereditary factors, and screening benefits but fears and misconceptions persisted. Notably, some believed wearing a bra increases cancer risk. This misconception about bras has been reported in studies conducted in Asia [29–31] and other Asian American subgroups [32, 33]. To our knowledge, our study is the first to report this misconception among South Asian Americans. Previous studies among South Asian immigrants, as well as Chinese, African and Hispanic immigrant women, identified fears rooted in fatalistic perception, family implications, and social stigma [34–40]. Others similarly reported that South Asian American women perceive benefits of screening [41, 42]. These findings highlight the need for targeted outreach and education to dispel fears and misconceptions by leveraging primary care providers and community educators.

At the interpersonal level, family dynamics acted as both barriers and motivators for breast cancer screening. Cultural values often prioritize family obligations over personal health for South Asian women [43–46], a pattern also seen in immigrant Hispanic, African, and other Asian subgroups [39, 44, 47]. However, our participants noted that personal connections and shared experiences provide inspiration and knowledge about breast cancer, which has also been documented among Korean American immigrant women [48]. This suggests South Asian American women may benefit from support to prioritize their individual health and that gender-neutral education for families should promote the importance of women's health. Community-based organizations can play a key role by harnessing family support and fostering positive narratives, which has been effective in other minority populations [49].

At the health care organization level, participants cited costs and insurance limitations as key barriers to quality care, even with health coverage. Language barriers and challenges with public programs, particularly for women on dependent visas, compounded these issues. These systemic barriers are well-documented among immigrant South Asian, other Asian, African, and Hispanic groups and highlight the need for targeted support and systematic changes [50–56].

Immigration-related barriers and knowledge-gains emerged as key themes at the societal level. Participants reported diet changes post-immigration. They faced challenges with high prevalence of processed foods, sedentary lifestyle, and costly organic food options. Participants also exhibited reluctance to disclose health information beyond immediate family members due to cultural norms of privacy, fear of burdening others, and perceived stigma. These mirror findings in other immigrant groups, including Chinese, Korean, Vietnamese, and other South Asian Americans [37, 57–61]. However, our participants noted that they would not disclose a breast cancer diagnosis to older relatives, despite its familial nature. This underscores the need for culturally sensitive interventions promoting healthy lifestyles and improving family health information sharing. Family-oriented approaches and support groups could aid in navigating health conversations respectfully.

Our study has some limitations. Although we successfully recruited 22 participants for FGs during the COVID-19 pandemic, three FGs had fewer than our goal of 6 participants. Indeed, smaller FG sizes have been recommended for high engagement in virtual discussions, and flexibility and adaptability are critical with digital recruitment – as was the case during the COVID-19 pandemic – though this presents challenges [62, 63]. Thus, to maintain research continuity, our approach required balancing FG recruitment with scheduling and retaining participants we had already engaged. For example, we accommodated participants' emergency needs, which meant re-scheduling a couple individuals to attend later FGs. However, we did not observe differences in per-participant talking time or discussion dynamics by FG size. Still, the overall sample size of 22 and high engagement allowed us to capture several important themes. Further, the reliance on English and the online platform may have resulted in participants with higher educational attainment and technological skills, as others have demonstrated some populations experience more difficulties and feel less comfortable with virtual platforms [64]. Despite our efforts to assist potential participants with technical issues and connecting to the virtual room, some women may have decided at the outset to not participate upon realizing technology requirements. Even among English-proficient women comfortable with technology, it is unclear whether an in-person format would have influenced the nature of the discussion. Additionally, guidelines recommend screening for women over age 40 years, but our study included one woman younger than the recommended starting age. Our rationale for the younger inclusion criteria was based on a prior analysis of SEER registry data linked with the American Community Survey revealed that approximately 60% of South Asian American women are aged 25 years or older (median age: 27 years), representing a majority demographic of our study population [4]. Finally, all participants in our study had Indian or Pakistani origins, which limits generalizability of our findings to women with origins in other South Asian countries. However, since 90% of South Asian American women are of Indian or Pakistani descent [65], our study's findings are likely applicable to the majority of South Asian immigrant women. It remains important to explore whether similar themes apply to other groups from Bangladesh, Bhutan, Maldives, Nepal, and Sri Lanka in future studies.

Despite these limitations, our study successfully identified several individual, interpersonal, cultural, social, and structural factors that shape South Asian immigrant women's perspectives of breast cancer, who may have higher risk of breast cancer than their US-born counterparts [66]. We also employed multiple strategies, including transparency in reporting our methods, to ensure rigor of the study [67]. Further, we synthesized our findings into recommendations for future community outreach interventions and policy efforts aimed at improving breast cancer-related health among South Asian American women.

Conclusion

Our findings provide important insights into psychosocial, social contextual, and structural factors shaping South Asian American immigrant women's breast cancer beliefs and behaviors. These data identified modifiable targets for interventions to enhance community outreach for recent immigrants and highlight policy changes to improve breast cancer-related health of South Asian American women, a fast-growing population in the US.

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Author contributions

REK, EVB, AYK, and JMS contributed to the conceptualization and design. Material preparation and data collection were performed by TD and JMS. JT and MM analyzed the data. JMF and SM provided project administration. AYK and JMS acquired funding. JMS supervised the project. The main manuscript text was written by REK, JT, and JMS. All authors read, reviewed, and edited the manuscript.

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Data availability

The qualitative data analyzed during the current study are not publicly available but may be available from the corresponding author upon reasonable request.

Declarations

Competing interests

The authors declare no competing interests.

Ethics approval

The study was reviewed and approved by the Rutgers University Institutional Review Board (Protocol number: Pro2020002217) and was conducted in accordance with the Declaration of Helsinki.

Consent to participate

Informed consent was obtained electronically from all individual participants included in the study.

Consent to publication

The authors affirm that human research participants provided informed consent for publication.

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