

# A Community and Culture-Centered Approach to Developing Effective Cardiovascular Health Messages

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**OBJECTIVE:** Little is known about how best to target cardiovascular health promotion messages to minorities. This study describes key lessons that emerged from a community and culture-centered approach to developing a multimedia, coronary heart disease (CHD) patient education program (PEP) for medically underserved South Asian immigrants.

**METHODS:** The prototype PEP integrated the surface structures (e.g. language) and deeper structures (e.g. explanatory models (EMs), values) of South Asians' socio-cultural context. Seven focus groups and 13 individual interviews were used to investigate South Asians' reactions and obtain qualitative feedback after viewing the culturally targeted PEP. Qualitative data were organized into emergent thematic constructs.

**RESULTS:** Participants (n=56) mean age was 51 years and 48 % were Hindi speakers. Community members had a strong, negative reaction to some of the targeted messages, "This statement is a bold attack. You are pin-pointing one community." Other important themes emerged from focus groups and interviews about the PEP: 1) it did not capture the community's heterogeneity; 2) did not sufficiently incorporate South Asians' EMs of CHD; and 3) did not address economic barriers to CHD prevention. Feedback was used to revise the PEP.

**CONCLUSION:** A community and culture-centered approach to developing cardiovascular health promotion messages revealed tensions between the researcher's vantage point of "cultural targeting" and the community's perceptions and reactions to these messages. Engaging communities in every phase of message design, incorporating their EMs, recognizing community heterogeneity, and addressing economic and structural barriers, are critical steps to ensuring that health promotion messages reach their intended audience and achieve true cultural appropriateness.

**KEY WORDS:** cardiovascular; health communication; Asian-American; culture; qualitative.

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## BACKGROUND

Despite the call to improve the cardiovascular health of *all* Americans,<sup>1</sup> little is known about how best to adapt cardiovascular health promotion for minority communities. A statement on cardiovascular disparities highlighted the importance of addressing cultural beliefs and practices when designing interventions because of their effect on patients' preferences, behaviors, and health care utilization.<sup>2</sup> One way to address cultural beliefs and practices in health interventions is to develop culturally targeted messages, which segment audiences based on cultural characteristics.<sup>3–5</sup> Segmenting populations into subgroups by their cultural characteristics may enhance receptivity to, acceptance of, and salience of health messages being presented. The most common forms of cultural targeting are matching the intervention messages to the observable, surface characteristics of culture, such as language, dress, or foods.<sup>6</sup> While this is important, because it increases audience interest and initial receptivity to messages, targeting the surface characteristics of culture is unlikely to result in behavior change.<sup>6</sup> Others, building on anthropological and sociological theory, have suggested that health promotion interventions are more likely to impact behavior change when interventions target the *deeper* structures of culture, such as the target groups' explanatory models (EMs) about the causes of health and illness<sup>7</sup> and their unique facilitators and barriers to behavior change.

The EM is used to understand differences in the explanation of illness and disease. EMs are based on the patient's perspective<sup>7,8</sup> and are influenced by people's social and cultural contexts and prior experiences.<sup>9–11</sup> The type of EMs held by patients influences receptivity to health promotion messages,<sup>5,12</sup> health behaviors,<sup>13</sup> and what course of treatment an individual follows.<sup>14</sup> Previously, we reported on U.S. South Asians' (Asian Indian and Pakistani) EMs of CHD, as well as their knowledge and attitudes about CHD prevention.<sup>15–17</sup> South Asians, who are the second fastest growing racial/ethnic group in the U.S., suffer higher rates of CHD compared to other racial/ethnic groups.<sup>18–24</sup> A majority of South Asians are immigrants and may have different explanations for what causes CHD, which could impact their willingness to change behavior.

Our prior research, which took place in a medically underserved South Asian community, found that South Asians' EMs of CHD differed from the biomedical model which underlies most CHD prevention messages.<sup>16</sup> Although South Asians' EMs did include unhealthy diet and physical inactivity, their EMs emphasized stress as the root cause of CHD. When asked how one can prevent CHD, few talked about controlling cholesterol or blood pressure, but 40 % mentioned reducing stress.<sup>15</sup> In addition, the majority of South Asians interviewed believed that heart attacks are **not** preventable.<sup>15</sup>

These formative research findings were integrated with theoretical construct commonly used in behavioral,<sup>25</sup> communication,<sup>5,26,27</sup> and learning sciences<sup>28,29</sup> to develop a culturally targeted, multimedia coronary heart disease patient education program (CHD PEP) for medically underserved South Asians. The first version of the PEP had six modules that were designed to increase South Asians': 1) perceived susceptibility to CHD; 2) knowledge about modifiable risk factors; 3) belief that CHD is preventable; 3) behavioral intention to get screened for modifiable risk factors; and 4) behavioral intention to improve lifestyle behaviors. The present study was designed to qualitatively assess South Asians' reactions to the first two modules of the PEP and describe how emergent themes were used to revise the intervention. The lessons from this community and culture-centered process can be used to guide the dissemination and implementation of culturally targeted health interventions for diverse communities and have potential to be applied across other health conditions.

## METHODS

### PEP Development and Conceptual Framework

The PEP was designed for use either in a primary care or community-based settings where it can be used with individuals or groups and accessed via the internet, a clinic kiosk, a link within an electronic medical record, or even as a DVD available for patients to take home. The six multimedia modules, approximately 5 minutes each, were designed to deliver actionable CHD prevention education promoting a healthy lifestyle and screening for clinical risk factors. The modules are in English and Hindi and include graphics, animation, photographs, and brief text reinforcing visually presented concepts. The spoken audio was narrated by a bilingual, female narrator. The modules are not interactive, but rather, introduce a limited number of concepts that can be followed by clinic staff or a community worker leading a brief goal-setting session with patients to reinforce learning and help patients initiate heart healthy behaviors. The research team, which was comprised of two primary care

physicians, a communications expert, a registered dietician, a multimedia design expert, and a bicultural research assistant, used formative research on South Asians' EMs,<sup>15-17</sup> CHD prevention guidelines,<sup>30</sup> and multiple theoretical and practical considerations in the design of the PEP. We briefly review the theoretical and practical considerations below.

### Health Behavior Theory

The PEP was designed to increase South Asians' *perceived risk of CHD* (i.e., severity and susceptibility) and *perceived benefits* of prevention because these constructs, from the Health Belief Model, were hypothesized to be important mediators of enacting a particular CHD prevention behavior.<sup>31-33</sup> The messages also addressed attitudes, subjective norms, and perceived behavioral control, which are constructs from the Theory of Planned Behavior,<sup>25,34</sup> because our formative work suggested that these constructs were influencing CHD prevention behaviors in South Asians.<sup>15-17</sup>

### Communication Theory

The message content and structure were developed with attention to communication theories related to framing,<sup>27</sup> use of affective strategies (e.g. fear appeals),<sup>35</sup> and cultural targeting.<sup>5,36,37</sup> The PEP opened with a fear appeal message and later in the video, included positive, gain-framed messages because evidence suggests that these strategies are more effective at increasing self-efficacy and behavioral intent to engage in CHD screening behaviors.<sup>27</sup> Culturally targeted communication strategies<sup>5,36,37</sup> included incorporating the surface (pictures, language) and deep structures (values, EMs) of culture.

### Learning Theory

The research team designed the PEP using adult learning and education principles,<sup>28</sup> as well as cognitive factors 'best practices,'<sup>29</sup> that have been shown to increase comprehension of health information in patients across education and literacy levels. To lessen the demands of the PEP on patients' working memory (i.e. decrease cognitive load), we: (1) used plain language and avoided jargon; (2) minimized the number of new concepts introduced simultaneously; (3) presented new information in a sequential manner so that the learner could more effectively use stored (previously learned) material in learning new information; (4) chunked information into manageable pieces; and (5) avoided distracting, 'off-message' information. These features allow learners to more fully apply their cognitive abilities to acquiring and remembering new information.<sup>38,39</sup>

In this paper, we describe the use of focus groups and interviews to obtain qualitative feedback and refine the first two modules of the culturally targeted PEP. These modules, “What is Heart Disease,” and “Three Things to Talk to Your Doctor About,” were designed to increase South Asians’ perceived susceptibility to CHD, knowledge about the causes of CHD, belief that that CHD is preventable, awareness of prevention through screening for clinical risk factors, and intention to get screened for cholesterol, diabetes, and hypertension.

## Study Design and Participants

Seven focus groups (mean number of participants=6) and 13 individual interviews were conducted between September and November 2009, with a total of 57 adults. A combination of focus groups and individual interviews were used because of participants’ availability. Participants were recruited from a federally qualified health center (FQHC) and two community centers that provide non-health care related services for South Asian immigrants in Chicago, Illinois. The FQHC and community centers are located in densely populated residential areas, with a large population of recent South Asian immigrants who are medically underserved and have lower incomes and education levels than the general U.S. South Asian population.<sup>40</sup>

This study was limited to Hindi and English-speaking adults (20–75 years of age) who self-identified as Asian Indian or Pakistani because these are by far the largest South Asian subgroups in Chicago.<sup>40</sup> Study flyers were distributed at the recruitment sites; staff at the FQHC and the community organizations organized the focus group sessions and also helped recruit clients for individual interviews. Participants were encouraged to inform their friends and family members about the study. Participants received \$25 for their participation. The study protocol was approved by the institutional review board of {unnamed} university.

## Interview Guide and Procedures

Prior to each focus group or individual interview, participants engaged in the informed consent process with a trained research assistant and completed a one-page demographic questionnaire. Participants were shown the entire module and then surveyed about their reactions to the video using a brief quantitative questionnaire. A semi-structured interview guide was developed by the study investigators to help elicit participants’ reactions to the messages and design of the PEP. The same interview guide was used in focus groups and individual interviews. Participants were asked to describe their initial reactions to the video, what they learned, whether any sections were

unclear, and their likes and dislikes. The focus group moderator then showed short segments or images from the videos’ key points and asked participants to describe, in their own words, what was being shown. They were then asked about their reaction to the segment, including if they agreed with the message in the segment, the clarity of the segment, and how it could be improved. Finally, participants were asked about their affective response to the video (e.g., afraid, hopeful) and if they felt motivated to get screened or change any behaviors. Focus groups lasted between 60 and 90 minutes and interviews lasted between 30 and 45 minutes.

## Analysis

The focus groups and individual interviews were recorded, transcribed verbatim, and translated by the research assistant who conducted the focus groups and interviews, using a procedural manual from our earlier studies.<sup>16,17</sup> Hindi words that were unique and had no English equivalent were not translated. The research team discussed the translation and meaning of key words and phrases in the transcripts to ensure cultural equivalence. Transcripts were analyzed using latent content and constant comparative techniques<sup>41</sup> through which three of the study authors independently assessed participant responses for focal themes before convening to compare and compile their findings. Through consensus, the coders constructed an overarching categorical system to describe the themes pertaining to cultural targeting of messages and to conceptual constructs underlying messages; specifically, coders focused on themes relating to the use of a targeted impact statement to increase perceived susceptibility to CHD, EMs of CHD, perceived benefits of screening for modifiable risk factors, and perceived behavioral control related to CHD prevention. The coders then returned to the data to assess independently the adequacy of the categorical system and the need for additional codes that were not initially captured. The team reconvened to discuss the major conceptual themes that emerged from the transcripts and to reconcile discrepancies. Through this process, the team codified an inventory of the community’s knowledge and issues related to CHD etiology, prevention, and screening. The team then reviewed the transcripts together and selected exemplars to demonstrate the major conceptual themes through discussion and consensus.

## RESULTS

### Sample Characteristics

The average age of participants (n=57) was 53 years, 74 % were women, and all were immigrants (Table 1).

Table 1. Participant Characteristics

Total N*=57	
Mean Age (years)	53
Gender	
Female (%)	74
Years in U.S. (mean)	12
Language of interview/focus group	
English (%)	53
Hindi (%)	47
Education	
Completed high school or more (%)	77
Employment	
Not employed (%)	68
Religion	
Hindu (%)	47
Muslim (%)	40
Country of birth	
India (%)	77
Pakistan (%)	16
Other (%)	7

\*Seven focus group discussions, 13 individual interviews

Three Hindi focus groups and four English focus groups were conducted. Of the 13 individual interviews, eight were in Hindi and five in English based on participants' language preferences.

### Targeted Impact Message and Perceived Susceptibility

The introductory module of the PEP opened with a targeted impact statement, "Heart attack is the number one killer of Asian Indians and Pakistanis." This statement was designed to capture the audience's attention and increase their perceived susceptibility to CHD. Community members had a vigorous and mostly negative reaction to this statement (Table 2, Theme 1 Quotes). For example, one Hindi-speaking man said: "Is this a bold attack? That is how it looks if we target a community and say this. Unless it is fully based on statistical data then its fine, but maybe you want to mild it a little bit, (Male, 71 years)." Others agreed, saying that the statement was too strong and direct, and that it would turn people off from the rest of the message.

Several respondents also said that the statement lacked credibility because it was not supported by any statistics. Participants said that they did not understand why the video was targeting South Asians because people from all communities have heart disease (Table 2, Theme 1 Quotes). One participant suggested using the phrase, "Heart attack is the number killer for everyone, (Female, 38 years)." Participants' feedback prompted us to modify the opening statement (Table 2 Theme 1, Modifications). In subsequent focus groups, participants had a much more positive response to the modified opening statement. Specifically, they said that the statement seemed more factual and captured their attention, without "scaring them too much" or "offending" them.

### Community Heterogeneity and Perceived Risk

In our prior research, South Asian women were less likely to perceive themselves at risk for CHD compared to men.<sup>16</sup> To increase women's perception of CHD risk, the original PEP opened with an image of an older South Asian woman with her daughter and granddaughter (Fig. 1). Participants said this picture was too personal and disconnected from the narration. Even more important, participants felt strongly that the images in the video should capture the heterogeneity of the community, with regards to gender, age, and body type (Table 2, Theme 2 Quotes). Several said that the message of the picture and the narration should be, "A heart attack can happen to any one of us." Based on these suggestions, a diverse montage of Asian Indians and Pakistanis was added as the opening image (Fig. 2). The modified picture and statement were received much more positively in subsequent focus groups and interviews, where participants said, "You can establish a connection. There are many people here of different age groups, and it says that anybody can get a heart attack, does not matter young or old, man or woman, (Male, 71 years)."

### Stress and Explanatory Models of CHD

Previously, we found that South Asians believed that chronic stress or stressful events cause heart disease and heart attacks.<sup>15,16</sup> Many described experiences where a family member received bad news and then had a heart attack. Because these beliefs may impact perceived behavioral control related to CHD prevention, the PEP included messages to change these beliefs. The PEP showed a picture of blood vessels clogging and the narration, "Many people believe that stress or bad news cause heart attacks. The truth is that heart attacks are caused by the blood vessels getting clogged, slowly, over time." After viewing the PEP, participants were unconvinced and confirmed our prior findings that the beliefs about stress causing CHD are widespread (Table 2, Theme 3 Quotes). For example, one participant said, "You are trying to address the myth here, but it is deeply rooted in people's mind. Just one sentence is not going to take it away, (Male, 71 years)." People also spoke about how these beliefs were rooted in their experiences and were reinforced by physicians back in India (Table 2, Theme 3 Quotes).

Several community members suggested that the PEP should acknowledge that stress can influence the development of CHD, while also discussing the importance of other risk factors. Participants also said the PEP should include information on stress management as part of CHD



Table 2. Thematic Analysis of Qualitative Data and Modifications to the Patient Education Program

Theme	Related Quotes	Modifications to the PEP
1) Targeted impact message: Opening impact message was too direct and an "attack."	<p>"Why particularly South Asian people? The people, other than Asians, use oils, even they smoke, even they are busy with their works and stuff and do not exercise regularly. But why basically for Asian people?" (Female, 27 years)</p> <p>"You are being too hard on Indians. "This is like it's nailed towards Indians" (Female, 24 years).</p> <p>"Why is this video especially for Indians and Pakistanis? In the USA, I have seen many. Heart disease is a common disease." (Male, 56 years)</p>	<p>Original narration: "Heart attack is the number one killer of Asian Indians and Pakistanis."</p> <p>Modified narration: "Heart attack is the number one killer of people all around the world. Studies show that Asian Indians and Pakistanis are more likely to have heart attacks than people from other communities."</p>
2) Community heterogeneity: Images and messages not speaking to the whole community.	<p>"Some people might think that only women are more susceptible to heart attack, by putting a man in the picture it shows both are susceptible, balancing I mean." (Female, 26 years)</p> <p>"The picture shows a mother daughter relationship, but not everybody who knows someone who had a heart attack has a mother. (Female, 32 years)</p> <p>"I don't see any connection here between narration and the picture." (Female, 68 years)</p>	<p>Original opening picture: see Figure 1</p> <p>Modified opening picture: see Figure 2</p>
3) Stress and explanatory models of CHD: Community's belief that stress causes CHD should not be negated. Community's explanatory model should be incorporated into messages.	<p>"Few things missing in this video. Even if heart disease does not run in your family, even then you could get it if you are facing some sorrow or a big problem in life." (Female, 70 years).</p> <p>"You say that stress and tension do not cause heart attack, but doctors in India say don't take stress or tension or probably you could have a heart attack. Why this conflicting recommendation? What's the true relationship?" (27 years old female)"</p> <p>"You should add some information on controlling stress as part of prevention (Female, 38 years).</p>	<p>Original narration: "Many people believe that sudden shock or bad news can cause a heart attack. It may look like a heart attack happens suddenly, but the truth is that heart attacks are caused by blood vessels getting clogged, slowly over many years."</p> <p>Modified narration: "Many people know someone who had a heart attack suddenly after getting bad news or having a lot of stress. It may look like a heart attack happens suddenly. But bad news or stress by themselves do not cause a heart attack. If someone already has clogged blood vessels in their heart, stress can make this worse."</p>
4) Perceived behavioral control: PEP was effective at changing perceptions and beliefs, but PEP should also address structural barriers to screening.	<p>"I like the awareness towards prevention. Being a young healthy person, I never thought about it. Even youngsters should get checked regularly and talk to your doctor about heart disease. I always thought this cholesterol and diabetes could only happen to older people. It was new to me." (Male, 29 years)</p> <p>"Insurance is a problem. Those who don't have it cannot get too many tests done. Getting check-up is very hard for us." (Female, 38 years)</p>	<p>Original PEP: Did not address structural barriers to screening.</p> <p>Modified PEP: Provides information on federally qualified health centers where people that are underinsured or uninsured can get screened.</p>

prevention (Table 2, Theme 3 Quotes). In addition to changing the message in the introductory module (Table 2, Theme 3 Modifications), we developed a separate module on how stress can affect cardiovascular health, along with strategies for stress management.

### Perceived Benefits of Screening and Behavioral Control

In our formative research, a majority of South Asians said that heart attacks are not preventable and very few talked about CHD prevention through screening and treatment for clinical risk factors such as high cholesterol, blood pressure, and diabetes.<sup>15,16</sup> There was also a common belief that vegetarians cannot have high cholesterol.<sup>16</sup> This is particularly salient in a

community with a large number of Hindus who traditionally do not eat meat. In order to increase the community's knowledge and perceived behavioral control related to cholesterol, the narration said, "Everyone's body makes cholesterol and your body can make too much cholesterol. Even if you are a vegetarian you can still have high cholesterol because your body can make too much cholesterol." Participants had a positive response to this message, saying it made them realize that they should get screened (Table 2, Theme 4 Quotes). A typical reaction was, "Your body makes cholesterol? Oh my God, I am producing my own junk. I didn't realize that the body can make it (Female, 65 years)." Participants said that the messages did make them want to get screened; however, several participants also mentioned that in this community, lack of health insurance



**Figure 1.** Opening picture in prototype PEP. Narrator: “Heart attack is the number one killer of Asian Indians and Pakistanis. Almost everyone knows someone who has had a heart attack. Have you ever wondered why they had a heart attack?” (*Video zooms onto the older woman behind the swing.*)

was the main barrier to screening (Table 2, Theme 4 Quotes). To address this barrier and increase perceived behavioral control, the revised PEP included an information screen on neighborhood FQHCs and other low-cost health centers.

## DISCUSSION

Although there is a growing literature on culturally targeted health interventions for African American and Latino communities,<sup>4,42–44</sup> far less is known about the development process and how diverse communities react to such interventions.<sup>45</sup> We used a community and culture-centered approach to develop and revise a multimedia, culturally



**Figure 2.** Modified opening picture in PEP. Narrator: “Heart attack is the number one killer of people around the world. Studies show that Asian Indians and Pakistanis are more likely to have heart attacks than people from other communities. Almost everyone knows someone who has had a heart attack. Have you ever wondered why they had a heart attack?” (*Video pans across montage and stops on woman in front.*)

targeted CHD PEP for medically underserved U.S. South Asians. The user perspectives in this study highlight the ways in which a community’s EMs, daily lived experiences, and socio-economic context can influence responses to culturally targeted CHD prevention messages. There are several key lessons that can be applied across diverse settings and to other conditions.

This study uncovered the tension that often exists between the biomedical model and a community’s EMs. Because the research team felt it was critical for South Asians to understand that screening for and controlling clinical risk factors are central to CHD prevention, the initial version of the PEP emphasized clinical risk factors and downplayed the community’s EMs of stress causing CHD. This approach was not effective at engaging community members, who said that if the messages tried to negate their EMs about stress and CHD, the messages would be less credible. The focus groups revealed that EMs are deeply-ingrained and often reflect the psychosocial and experiential factors that influence health and behavior change. A recent study found that a narrative-based intervention, utilizing a Health Belief Model and delivered via an interactive DVD, improved blood pressure control in African-American patients with uncontrolled hypertension.<sup>44</sup> Although ours is not a story-telling intervention, the PEP was developed using formative data on EMs and incorporated South Asians’ beliefs about CHD. Health education interventions that explicitly incorporate patients’ EMs, delivered via narratives or other sources, may be more effective at initiating health behavior change because the messages are perceived as more credible and because they acknowledge the multiple causal pathways that influence the health of the target community.

Many studies have found that patients, especially those from vulnerable populations, implicate stress as an underlying cause of CHD<sup>46,47</sup> and risk factors, such as hypertension<sup>48,49</sup> and diabetes.<sup>43,50,51</sup> In some cases, these beliefs influence behavioral control and behaviors, such as adherence to medication.<sup>52,53</sup> Based on the community’s feedback, the revised PEP incorporated South Asians’ EMs about stress and CHD, while also provided clear and actionable information about the importance of controlling clinical and lifestyle risk factors. This strategy can be used for addressing the disconnect that exists between lay EMs and the biomedical model that underlies most health promotion messages. We also developed an additional module, “Take Care of Your Stress and Tension,” that talks about the inter-connectedness between stress, diet, and physical activity and provides advice on coping strategies. Our findings, and others, suggest that culturally targeted health communication must not only engage the biomedical model, but must also engage the EMs that facilitate or inhibit behavior change in the target community.<sup>54</sup> Studies are needed to answer the questions of whether CHD

interventions that incorporate community members' EMs about stress are more effective than interventions based solely on a biomedical model and whether the effect varies across settings and conditions.

We also found that there may be unintended consequences to fear appeals that use targeted impact statements. Others have suggested that culturally targeted impact messages are more likely to increase the target audience's attentiveness and receptivity compared to non-targeted health promotion messages because they send the message that, "this problem affects people like you."<sup>37,55</sup> However, in the present study, the opening message elicited a strong, negative affective response from community members and diverted their attention from the remainder of the PEP. South Asians said they felt that they were being unfairly targeted since heart disease is prevalent in many communities; they also said the language in the message was too direct and felt like a "bold attack." Another study also found that African Americans had negative reactions to targeted colon cancer screening messages,<sup>55</sup> and that they rejected health risk messages that were perceived as "too threatening." African Americans had a more positive affective response to messages that emphasized progress in disparities compared to messages that solely emphasize the disparity.<sup>55</sup> Some minority communities may be wary of targeted health messages due to prior experiences with discrimination<sup>56</sup> or stigma.<sup>57</sup> In our formative work, South Asians described feelings of social isolation and difficulties associated with immigration,<sup>58</sup> and these factors could have contributed to the feeling that their community was being 'singled-out.' Another possible explanation is that South Asian societies and languages are less direct than many Western societies and languages.<sup>59</sup> This difference in communication style should be considered when designing messages for South Asians and other communities where social interactions and language are less direct.<sup>45,60</sup> Future studies should explore how framing,<sup>61</sup> affective strategies,<sup>35</sup> and language influence responses to health messages across diverse populations and cultures.

Another important theme that emerged during the discussions was that the PEP did not capture the target populations' heterogeneity. Community members said that the messages were not speaking to all of them. In health research, data aggregation often leads to a loss of the heterogeneity within racial/ethnic groups.<sup>62,63</sup> A similar situation can occur when culturally targeted health message segment their audience based on race/ethnicity.<sup>45</sup> There is significant socio-demographic and behavioral heterogeneity within these racial/ethnic segments, and health communication interventions need to identify messaging strategies that speak to the diversity within any given group. Community members' input also highlighted the importance of economic barriers on their perceived behavioral control related to screening for CHD risk factors. Even though participants found the messages about getting screened for cholesterol, high blood pressure, and diabetes to

be effective at changing their knowledge and attitudes, they said that lack of insurance and access to health care were key barriers to getting screened. Numerous studies have shown that lack of insurance and access to health care are barriers to preventive and screening services.<sup>64,65</sup> In addition to addressing health beliefs, knowledge, and attitudes, health communication messages for medically underserved communities may have more of an influence on perceived behavioral control if the messages also address the economic and structural barriers to healthy behaviors.

This study has several strengths, including the use of multiple focus groups and individual interviews in English and Hindi and the use of a bilingual and bicultural research assistant with prior experience conducting qualitative research in this community. The study also has important limitations. First, these findings cannot be generalized beyond the population examined in this study. This was a convenience sample of Asian Indians and Pakistanis from one medically underserved, urban community with a high proportion of recent immigrants. These findings were not intended to capture the perceptions of all U.S. South Asians, but are useful in generating hypotheses that can be tested in future research. The majority of participants were also women, and we may not have captured important differences between South Asian men's and women's reactions to the CHD messages. In addition, despite the moderator's effort to ensure that everyone in the focus groups had a chance to speak, the group setting could have led to bias related to social desirability and outspoken participants dominating the conversation. Therefore, the focus groups may not have captured the full range of opinions among all participants.

The key lessons that emerged in this process can be used to guide the development of effective health promotion messages in partnership with diverse communities. First, formative research should be done to understand the EMs that may be influencing health and disease prevention within a particular community; second, health promotion interventions can navigate the tensions that may exist between the community's EM and the biomedical model by incorporating the community's EMs into targeted messages; third, communities and cultures are not monolithic, and messages must reflect the heterogeneity within a target community; fourth, culturally targeted interventions should also address the economic and structural barriers that impact health behaviors; and finally, it is hard to predict how communities will react to culturally targeted health messages, and thus, full engagement of the community in every phase of message design is critical and ideally, should be an iterative process.

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