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Barriers to Lifestyle Behavioral Change in Migrant South Asian Populations

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Abstract

The purpose of this literature review is to describe and assess the cultural barriers to behavior change in migrant South Asians, given the high morbidity and mortality associated with cardiovascular disease in this population. We reviewed studies that explored the relationship between South Asian culture in the Diaspora and lifestyle behaviors. Our review produced 91 studies, of which 25 discussed the relationship between various aspects of South Asians' belief system and their approach to modifying lifestyle habits. We identify 6 specific categories of beliefs which play the largest role in the difficulties South Asians describe with behavior change: gender roles, body image, physical activity misconceptions, cultural priorities, cultural identity, and explanatory model of disease. Future research and interventions should account for these cultural factors to successfully improve dietary habits and physical activity levels in migrant South Asian populations.

Keywords

South Asian; Diet; Exercise; Cardiovascular disease; Cultural barriers

Introduction

The last century and a half has seen a great deal of South Asian (people with ancestry from India, Pakistan, Bangladesh, or Sri Lanka) migration to developed countries such as the United Kingdom (UK), Canada, Australia, and the United States (US). As a result, South Asians make up a significant and growing portion of the population in many of these

countries [1]. For instance, in the United Kingdom, South Asians comprise the largest ethnic group [2]. According to the 2009 American Community Survey 1 year estimates, the Asian Indian population had a 55% growth rate in the last decade, surpassing that of Hispanics (37%), Chinese (28%), and Filipinos (34%), and have become the second most populous Asian ethnic group in the US. Among Asian ethnic groups in the US, only the Chinese (population 3,106,005) outnumber South Asians (population 3,077,599) [3, 4]. Since South Asians represent a substantial proportion of these nations' populations, medical conditions that are prevalent among South Asians are increasingly important to their societies and public health.

Cardiovascular disease (CVD) is one of the most prevalent health problems facing South Asians today. Regardless of location, South Asians exhibit the highest rates of cardiovascular disease among all ethnic groups [5–8]. The earliest reports of the higher prevalence of CVD originated in Singapore in 1957. In a series of nearly 1,000 autopsies, coronary heart disease (CHD) was seven times higher in Indian males than in Chinese males [9]. The more recent Singapore Cardiovascular Cohort study, a longitudinal study following 5,920 individuals also found a much higher risk of CHD in Asian Indians, compared to Chinese and Malays [10]. Data from the UK's Health Survey of England found that the prevalence of CVD was at least 30–40% higher in South Asians compared to Caucasians [11–13]. In the UK, it has been shown that second generation South Asians also have a higher risk for CVD [14]. Additionally, the SHARE study in Canada found the prevalence of CAD in South Asians to be more than twice that of Caucasians and Chinese [15]. Other countries such as, South Africa, Uganda, and Trinidad have also found higher rates of CVD in their South Asian populations [5, 16, 17]. Although US data on South Asian health is sparse, the disparity here is also clear. A Kaiser study in the 1980s revealed that Asian Indians had a 4 times higher hospitalization rate for cardiovascular disease compared to Caucasians [18]. Additionally, the Coronary Artery Disease Study in Indians (CADI), which studied Asian Indian physicians in the US, found that the age adjusted prevalence of CAD was 10.5% in Asian Indian physicians compared to 2.5% in the Framingham offspring Cohort [5]. Furthermore, in a cross-sectional study conducted from 1990 to 2000 in California conducted by the Stanford Research Prevention Center, Asian Indians had the highest proportional mortality ratio (PMR) due to coronary heart disease (ratio of the number of deaths attributed to a specific cause to the total number of deaths occurring in the population during a time period) compared to Caucasians, African Americans, Hispanics, Chinese Americans and Japanese Americans [19]. In India itself, comparison of various epidemiological studies have revealed that the prevalence of CAD has increased from 1% in 1960 to 10.5% in 1998 in the urban population [20]. It is felt that the South Asian region contributes more than any other region to the global burden of CVD [21–24].

The disparity between South Asians and other ethnic groups is most prevalent at younger age groups. The average age of first MI on the South Asian subcontinent is 53 compared to 60–65 for Caucasians in North America and Western Europe [20, 24]. Studies undertaken at Calicut Medical College in India have revealed that 25% of heart attacks in India occurred in individuals under the age of 40, compared to 4–6% in Western Europe and North America [25]. This disparity exists when comparing migrant South Asian populations to other ethnic groups as well. In the UK, the rate of MIs for men under the age of 40 in South Asians was 4

times that in Caucasians [25, 26]. In the above mentioned Stanford University study, the PMR for CHD was highest in Asian Indian men in the 24–44 age group [19].

In searching for an explanation for the high prevalence of CAD in South Asians, the CADI study found that there was a higher prevalence of diabetes, higher triglyceride levels, and lower HDL levels in Asian Indians compared to Caucasians [16, 25]. Additionally, data from the UK and India have shown that South Asians have more total and central adiposity compared to Caucasians, contributing to higher rates of insulin resistance and diabetes [27–34]. The INTER-HEART study, a multinational cross-sectional study which enrolled 15,152 cases of first AMI and 14,820 age-matched controls in 262 centers in 52 countries, examined CVD risk factors across many different ethnic groups. The 9 risk factors listed in Table 1 are felt to explain 86% of the risk in South Asians. The low consumption of fruits and vegetables in South Asians, the lack of regular exercise, and the high waist:hip ratio were felt to contribute the most to higher rates of CHD seen in South Asians [24]. Studies in the UK and Canada also have consistently found lower levels of physical activity among South Asians compared to other ethnic groups [35–38]. In the US, a study conducted in Texas where participants were recruited from health fairs revealed not only a higher prevalence of the metabolic syndrome in South Asians, but also low physical activity levels [39]. In examining dietary habits, data from the SHARE study and the CADI study have shown that South Asian diets are high in carbohydrates and fat and contribute to low HDL and high triglyceride levels [40, 41]. Studies have shown that low physical activity levels, low fruit and vegetable intake, and high carbohydrate intake are common in South Asian children and adolescents, leading to acquisition of central obesity, insulin resistance, diabetes, and low HDL levels at younger ages (in their 30 s) compared to other ethnic groups, thus leading to CVD at young ages [20, 37, 42, 43]. Therefore, addressing the lifestyle behaviors of diet modification and physical activity levels can have a tremendous impact on CVD prevalence in South Asians. However, an understanding of how social factors and cultural beliefs relate to diet and exercise behaviors in migrant South Asian communities is crucial to addressing these lifestyle behaviors.

Purpose and Objectives

The purpose of this review is to describe and assess the literature that addresses the difficulties migrant South Asians face in modifying diet and exercise behaviors. We evaluated literature that examined immigrant South Asian's experiences with behavior change and identified 6 categories of beliefs affected by South Asian culture which influence approaches to these lifestyle behaviors: gender roles, body image, physical activity misconceptions, cultural priorities, cultural identity, and explanatory model of disease.

This review will guide clinicians and providers on how to navigate cultural issues when caring for South Asian patients, provide a basis for future investigations regarding barriers to behavior change, and direct researchers and community organizations on how to design interventions for this rapidly growing population.

Methods

Search Strategies

We reviewed recent and past literature using OVID Med-line, OVID Embase, OVID Social Work Abstracts, Pub Med, Google Scholar, and Web of Science. Key search terms included South Asian, Asian Indian, Pakistan, Bangladesh, Sri Lanka, cardiovascular disease, diabetes, lifestyle modification, behavior change, education, and attitudes and beliefs. We also reviewed the references to capture articles missed in our search.

Inclusion and Exclusion Criteria

Articles were included if they met the following inclusion criteria: (a) written in English (b) focused on South Asian populations outside of the Indian subcontinent (c) explored diet and exercise behavior modification (d) explored cultural barriers to behavior change. We focused on diet and exercise behaviors because of their importance in the prevention and treatment of cardiovascular disease and diabetes. In our search, we found 91 articles that studied diet and exercise behavior in migrant South Asians. Of these, 24 discussed South Asian customs and belief systems and their relation to lifestyle behavior change. Preference was given to articles using qualitative methods as these gave more in-depth information regarding cultural beliefs and perceptions regarding lifestyle behavior change. These articles are outlined in Table 2.

Results

Gender Roles

Men and women have distinct roles in the typical South Asian household. The male (husband or father) is traditionally the head of the household and the decision maker, whereas the female (wife or mother) is responsible for food preparation and raising children. Although these responsibilities have become more shared in many Caucasian families, migrant South Asians have maintained these distinctions within their own households. A study conducted in West Yorkshire, UK, comparing family support of Caucasian and South Asian patients undergoing cardiac rehab found that in South Asian families, it is the male head of the household that exerts influence over dietary decisions, and hence is from where much of the resistance to dietary modification emanates. Although this study only involved patients undergoing cardiac rehab, patients and their caregivers were interviewed, specifically generating rich qualitative data on gender roles within families. Frequently, even if the female spouse seeks to make dietary changes to accommodate her husband's health needs, she is unable to do so because her husband refuses to sacrifice taste. Women also are less likely to make dietary changes even if they are the family member with the health issue requiring diet modification. The entire family is expected to make modifications for the male's medical condition, but not vice versa. In these instances, some females have described preparing a separate dish for themselves. However, the extra time and labor required to do this have caused these women to revert to their previous cooking methods [44].

Some households, for example, in which extended families live together, are dominated instead by the most senior or eldest persons living in the home. The dietary decisions in these households are made by the eldest female in the household. Younger women have expressed difficulties making healthy dietary changes due to the resistance they encounter by their parents or grandparents [44–46].

Further, the expected roles of women in the South Asian household are often a deterrent to starting an exercise regimen as well. Numerous qualitative studies conducted in South Asian communities in the UK have discussed how the majority of household and familial responsibilities fall on women, leaving little time to exercise. Although these studies had small sample sizes, they were able to recruit patients with various subethnic and religious backgrounds, and were able to successfully engage South Asian patients by conducting interviews in native languages. In many South Asian families, it was felt that women should not even designate time in one's daily schedule to exercise [45, 47–50]. In a study where one on one individual interviews were conducted with South Asian women with CHD or diabetes from 3 primary care practices in the UK, subjects discussed how devoting time to exercise is viewed as taking time away from caring for the family, cooking, and tending to children's needs, and therefore is felt to be culturally inappropriate in their families and communities. This view was more commonly held among older women [48]. Another study which explored barriers to physical activity using one on one interviews in South Asian diabetic patients in Edinburgh, UK found that for many women in South Asian families, any spare time is expected to be utilized to help benefit the family, such as by helping with the family business or by finding other ways to bring in more income [49]. In certain households, male members do not want their wives to go outside and exercise [47–49, 51]. For instance, the female figure in the home is expected to be available in order to provide food for the male when he wants it, making it hard or even unacceptable for women to leave the home [49, 52]. These views are often upheld by others in the community. As a result, a woman who is seen exercising or even going for a walk outside may be looked down upon, as is her family [53].

Although it is changing, traditionally, South Asian culture has emphasized physical separation between men and women. Hence, in regards to physical activity, many women only feel comfortable in female specific facilities and feel that it is culturally inappropriate to exercise around men. The absence of separation in most exercise facilities and gyms often dissuades South Asian females from taking advantage of exercise programs or joining a health club [48, 53]. Muslim South Asian women encounter additional cultural barriers to exercise related to the clothing they wear. The amount of traditional clothing worn by women on a day to day basis after immigrating varies. While many South Asian women wear western clothing daily, a substantial number wear traditional clothing every day. Maintaining these codes creates uncertainties about if and how to assimilate into society or utilize available services in one's new community. For instance, many women are uncertain how they will be viewed by others, particularly those unfamiliar with their cultural practices, if they wear their hijab or traditional clothing while exercising outdoors or at an exercise facility. The fear that others will stare or talk about them, and thus make them feel uncomfortable, discourages many women from starting any form of physical activity [54].

Body Image

In western societies, much of the motivation to eat well and to be physically active stems from body images that favor being slim. However, for many South Asian immigrants, larger body types are associated with sound health, which affects the motivation to engage in healthy lifestyle behaviors. Among South Asians, attitudes towards body image depend on the context of the outcome. One cross-sectional study compared body image perceptions among migrant South Asians, Italians, and the general population of women 20–40 years of age in the UK. The study did recruit immigrant and British-born South Asians and Italians, but was not able to delve deeply into body image perceptions since it was a survey-based study asking subjects to choose preferred body types designated by silhouettes. Nevertheless, all 3 groups overwhelmingly felt that the thinnest body types were beneficial for finding a spouse, a good job, and longevity. However, when asked to choose which silhouettes were most likely to have eaten healthy foods, give birth to healthy children, and be a healthy woman, 42% of migrant South Asians chose a silhouette depicting a woman with a BMI over 28, whereas only 8% of migrant Italians and 4% of the general population chose that silhouette [55]. The reason for this is that a thin body type is preferred when looking for a husband. However, a woman is expected to gain weight and “fill out” after marriage and not doing so is seen as a sign of a stressful marriage [56]. Furthermore, South Asians were less likely to have attempted to lose weight in the past and less likely to feel external pressure to lose weight, reflecting how, to a certain extent, women with higher BMIs are accepted and preferred in South Asian culture [55]. These beliefs concerning healthy weight and body image are obstacles that mitigate the motivation towards exercise and diet control.

Physical Activity Misconceptions

In general, South Asians immigrants tend to have lower levels of physical activity than other ethnic groups [57]. Much of this stems from culture and attitudes on the subcontinent itself. Within South Asian countries, there is not much emphasis on physical activity for health reasons (such as cardiovascular health, obesity, decreasing risk of type 2 Diabetes, bone and muscle strength, improved mood and mental health, maintaining ability to do daily activities upon aging) and as a result, many South Asians have not been brought up to exercise or participate in organized sports [49]. As South Asians immigrate to new communities, this unfamiliarity with the concept of physical activity hinders them from starting an exercise program when advised to do so by providers in their new communities. However, this apprehension often decreases with time. A Canadian study evaluating different immigrant groups revealed that physical activity increases with time since immigration. The largest difference was found in South Asian immigrant groups. South Asians that had lived in Canada longer tended to be more physically active compared to more recent immigrants [38]. Nevertheless, this unfamiliarity with physical activity has led to a variety of perceptions that further impede behavior change for migrant South Asians. Among some, there is anxiety concerning the physical effects of exercise, particularly that feelings of breathlessness and a rapid heart rate are signs of illness rather than normal physiological responses to exercise [49]. There is a fear of having these symptoms and not knowing what they mean, which discourages one to exercise on his or her own, particularly among those who do not speak English and are not able to ask for assistance [48].

Cultural Priorities

Despite the apprehension of exercising, the social priorities inherent among immigrant South Asians often makes it difficult to routinely exercise. The constraints felt by family responsibilities are not only limited to women of South Asian descent. In the previously mentioned qualitative study in Yorkshire, UK, men, in different ways, also expressed that there was not enough time to engage in physical activity. Although not primarily responsible for taking care of the household, immigrant South Asian men place much emphasis on spending the majority of their time providing for or helping their family. Although this is not uniquely a South Asian phenomenon, it is a barrier that many South Asian men identify with [49, 52, 58]. It is believed that time outside of work should not be spent on 'leisure' activities for oneself such as exercising, but instead should be used to help or care for other relatives or for spending time with their children. Even for men, exercising is looked upon as taking time out for oneself and is deemed culturally inappropriate. This belief is particularly strong among migrant South Asians, most of whom have sacrificed a great deal to leave their homelands and to provide better lives for their family and children. As a result of immigration, many South Asians rely on starting, managing, or working in businesses that open early and close late, such as shops or restaurants [49]. In fact, in a study of Asian Indians in the US, it was found that engaging in health promoting behaviors, such as exercise, was negatively related to the number of hours worked [59]. Many South Asians who have emigrated share the belief that South Asians have a strong work ethic and they take pride in the fact that this is part of their belief system and believe that it distinguishes them in their new communities. As a result, it has become almost expected to sacrifice health and physical activity for one's work and family [49, 60].

Maintaining Cultural Identity

For many migrant South Asians, reconciling advice on lifestyle behavior with their own cultural practices is very challenging, particularly when it regards dietary change. Unique customs that immigrants have brought with them are a great source of pride and identity, and holding onto these customs is a high priority. A central component of South Asian culture revolves around food and the unique qualities and blend of ingredients, oils, and spices that are part of the traditional South Asian diet. The fundamental role that food plays in South Asian culture affects attitudes toward dietary modification. One qualitative study in Leicester, UK utilized 6 different focus groups of South Asians of various religious backgrounds and purposely sampled individuals above the age of 40 in order to gain in-depth perspectives on culturally specific attitudes from those at higher risk of heart disease. A common belief among South Asians was that since their diet had been passed down for generations and because it is perceived that the earlier ancestors did not struggle with CVD, the traditional South Asian diet cannot be unhealthy or linked to heart disease [45]. Another common perception among vegetarian South Asians is that the absence of meat in their diet is healthy and a protective factor for CVD [46]. Additionally, many South Asians exhibit a resistance to change their cooking practices. Many hold the belief that their foods and vegetables are meant to be fried and not baked or broiled and changing their cooking method would require a sacrifice in taste and signify a transition away from their traditional diet [45, 61].

Food is a central component of South Asian social gatherings and is another manner in which South Asians preserve cultural ties to their homeland [62]. At these gatherings, it is considered unacceptable to turn down certain foods, increasing the struggle to maintain dietary change [58, 61]. In large communities, there are frequent social functions where the patient cannot control how the food was prepared [44, 46, 63, 64]. On the same token, in a number of communities, it is also considered inhospitable and shameful to serve curries with reduced oil and spices [54]. In a study exploring perceptions regarding cardiovascular risk from 8 focus groups involving Asian Indians from urban, suburban, and rural communities in Northern California, participants discussed how food was a central part of the family unit. They felt that giving food, particularly food that contains butter and milk, is a nurturing act, one given from the wife or mother to the rest of the family. Reducing butter and milk content is felt like depriving, oneself, one's family, or one's guests. However, there were some generational differences in opinions as well. Younger women would want to give children low fat or skim milk. However, the older generation of women resisted this change, asserting that giving low fat milk would be taking nutrients away from them [46].

Nevertheless, in the qualitative study investigating the food practices of South Asians in Edinburgh, UK, the majority of the respondents expressed that the South Asian diet was at least partially responsible for the high prevalence of type 2 diabetes in their communities. However, even among these respondents, there's a stringent defense of the cultural importance of their diet. Even though many felt that foods such roti (a type of flat bread), rice and foods prepared using ghee (a form of clarified butter) can be "dangerous" for their health, they strongly felt that these were staples, considering them the foundation of their diet and who they are as a people. There is significant pride in the flavor and flare of South Asian foods compared to British or American foods which are thought to be bland [61]. Regardless of how much one believes the South Asian diet contributes to disease, the overarching theme is that the diet is of central importance to their identity. Suggestions from physicians or dieticians often challenge some of the core principles of the South Asian diet, and it is felt that following these suggestions, would make one less Indian, Pakistani, Bangladeshi, or Sri Lankan, and more American or British, and therefore are met with a great deal of resistance [61]. These responses appear to reflect misconceptions regarding dietary change. Many do not believe it is possible to modify their dietary habits or cooking practices while still maintaining the inherent cultural and ethnic qualities of their diet. Some families, however, have started to make the necessary changes such as baking foods and using less oil [46]. Additionally, immigrants that have lived in the US longer have been more flexible in making changes to their diet, reducing the amount of ghee that is used or decreasing carbohydrate intake [65]. Much of the data regarding difficulty with dietary change has been generated from interviews with middle-aged to older South Asians and may not consistently apply to second generation South Asian immigrants. Nevertheless, reconciling dietary modification with maintenance of cultural identity is one of the most challenging barriers to healthy lifestyle modification in South Asians.

Explanatory Model of Disease

Unique qualities of an ethnic group's belief structure and explanatory model of illness also affect attitudes towards lifestyle behaviors. Perceptions regarding self-control over disease

causation are an important determinant in behavior change; individuals who do not believe their lifestyle factors contribute to acquiring disease are less likely to engage in healthy lifestyle behaviors [66]. The belief that acquiring diseases such as diabetes or CVD is not under one's own control is prevalent among South Asians. This can partially be explained by a heavy spiritual foundation found in South Asian culture. There is the belief that much of life is in a higher power's control and therefore not under one's own control. Along the same lines, many migrant South Asians believe that acquiring diabetes or CVD is due to fate [58, 67, 68]. One underlying factor which perpetuates these beliefs is difficulty in explaining disease causation between close friends and families. Even though many South Asians are able to reiterate that diet and exercise are important to reduce the occurrence of diabetes or CVD, they still do not feel like this offers sufficient explanation to why their husband, wife, mother, father, or sibling developed CVD or diabetes. Many have observed that their family members have adopted healthy lifestyles and still acquired disease [46]. Additionally, one can trace this view of disease causation to access to care on the South Asian subcontinent itself. In resource limited areas, such as the South Asian subcontinent, access to western medicine is expensive and limited. Most of the population in Bangladesh, for instance, uses traditional healers and thus, diseases are often understood in terms of humoral imbalances or supernatural factors, rather than environmental or lifestyle factors [69].

Nevertheless, it is not only this perspective that makes up the South Asians' belief structure, but also the concept that other uncontrollable external factors are mostly to blame for acquiring conditions like diabetes or CVD. A comparative qualitative study in Edinburgh, UK using individual, in-depth interviews to explore illness perceptions among 32 Caucasian and 32 South Asian diabetics revealed a marked difference in beliefs regarding responsibility for diabetes and was able to deeply delve into perceptions regarding disease causation. The sense of individual responsibility was a central theme to Caucasians' responses to disease causation but was notably lacking in the South Asians' responses. South Asians more frequently attributed disease to external factors and rarely to their own habits [67]. One of those external factors involves psychological stress [68]. Additionally, in a study which used open-ended interviews to examine views on heart disease etiology and prevention among South Asians in Chicago 20–75 years of age, psychosocial factors were often mentioned as contributing to disease [70]. Stress is one of the most frequently mentioned contributors to heart disease and diabetes among South Asians, regardless of age or generation [58, 67, 70, 71]. Many migrant South Asians feel that their immigrant status—living and adjusting to life in another country—adds to the regular stressors of life [58, 72]. The struggle to maintain one's ethnic and cultural identity often augments the stresses of finding work and raising children. Yet, data from the INTER-HEART study found that stress was less of a contributor to heart disease in South Asians than in other ethnic groups [24, 70]. Overly attributing the development of CVD to stress has led to a de-emphasis on diet and exercise behavior among South Asians.

In the above mentioned qualitative studies exploring beliefs regarding diet and exercise habits, most South Asians are able to express the link between these factors and disease. However, in the comparative qualitative study examining illness perceptions between Caucasians and South Asians in Edinburgh, deeper analysis uncovered how South Asians' cultural belief system influences views on these lifestyle factors. Many feel that they are not

able to control habits such as their diet. They attribute causality of unhealthy lifestyle habits to external factors, and not internal ones. For example, immigration to a new country, lack of food options, and long work hours were blamed for unhealthy dietary practices [67]. Perceptions regarding individual responsibility and causation of a disease are significant hurdles clinicians and researchers face in influencing lifestyle behavior change in migrant South Asians.

Discussion

Some of the most difficult and frustrating tasks for clinicians involve inspiring their patients to employ healthy lifestyle behaviors involving food intake and physical activity. A number of barriers exist for the general population, including access to healthier and cheaper food, access to markets, knowledge about healthy eating practices, and a means to be physically active. However, for certain ethnic groups, certain aspects of their culture impart additional barriers to behavior change. These cultural mores can conflict with western concepts of healthy lifestyle practices. For migrant South Asians, culture takes on even more importance than it did in their homeland. Immigrant groups in general, due to the sheer nature of not being immersed in a society that shares their customs, often hold on to certain beliefs and cultural practices more rigidly than their friends who have remained at home. As a result, influencing behavior change, particularly when the changes are perceived to clash with one's own customs is particularly difficult in these groups.

The aspects of South Asian culture outlined above are all inter-related, although some beliefs may be more important in some families and communities than in others. However, they are all issues that must be considered when caring for migrant South Asian populations. Due to the interplay between South Asian culture and behavior change, providers may need to spend additional time discussing difficulties with dietary improvements and physical activity with their South Asian patients. Additionally, physicians and dieticians should discuss lifestyle factors with the entire family when caring for a diabetic patient or a patient at risk for diabetes or CVD. It has been shown that interventions that have recruited husbands to participate can overcome the traditional resistance to dietary change from male family members [73]. Providers must gain an understanding of the cultural importance of the South Asian diet as well as the cultural barriers to physical activity in order to suggest feasible ways to make changes to these lifestyle factors.

There have been a number of interventions that have targeted diet and exercise behavior change in the migrant South Asian communities. As mentioned above, educational programs, as well as programs that have involved active participation of male family members, have shown some success in dietary improvements. Other efforts have shown modest benefit or have not been evaluated for their long term performance. However, to achieve more consistent and enduring improvements, researchers must take cultural beliefs and practices into account when addressing diet and exercise behaviors. Addressing these cultural barriers as part of behavior change interventions can potentially produce great strides in convincing migrant South Asians to alter their approach to lifestyle behaviors. These approaches will most likely be successful if studied and implemented at the community level. This enables researchers and community leaders to assess and work with

the customs their community strongly adheres to. Certainly it is not feasible to change customs, but when researchers work with migrant South Asian communities, how these issues will be dealt with must play a significant role in the planning process.

Conclusion

With the growing size and steady migration of this population, South Asian health issues will play an increasing role in many western nations' overall health. Advice from health care providers that appears to contradict with cultural beliefs tends to disengage migrant South Asian communities from the medical community. Less contact between health providers and the South Asian community decreases the opportunities to encourage preventative lifestyle behaviors. Policy makers must grant more opportunities to ideas that work with South Asian community members and account for cultural factors when studying behavior change interventions. A greater emphasis on prevention of diabetes and CVD in this population will not only be beneficial to researchers and communities in creating innovative community based solutions, but make clinicians more cognizant of the health issues facing the South Asian patients they treat.

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Table 1
Risk factors associated With acute myocardial infarction in South Asians compared with other participants in INTERHEART Study

Risk Factor	Cases, %	Controls, %	Odds Ratio (95% CI)	PAR, % (95% CI)
Apolipoprotein B₁₀₀/Apolipoprotein A-I Ratio*				
Other Countries	48.3	31.8	3.01 (2.77 to 3.26)	45.9 (43.0 to 48.7)
South Asia	61.5	43.8	2.57 (2.03 to 3.26)	46.8 (36.7 to 57.0)
Current and Former Smoking				
Other Countries	65.7	49.4	2.22 (2.09 to 2.36)	36.2 (34.1 to 38.3)
South Asia	61.6	40.8	2.57 (2.22 to 2.96)	37.5 (33.1 to 42.1)
Hypertension				
Other Countries	40.5	23.6	2.44 (2.30 to 2.60)	23.9 (22.5 to 25.4)
South Asia	29.6	12.7	2.92 (2.46 to 3.48)	19.3 (16.6 to 22.4)
Diabetes				
Other Countries	18.2	7.2	3.20 (2.93 to 3.50)	12.5 (11.6 to 13.4)
South Asia	20.2	9.5	2.52 (2.07 to 3.07)	11.8 (9.6 to 14.5)
High Waist-to-Hip Ratio*				
Other Countries	46.7	34.0	2.21 (2.06 to 2.38)	33.3 (30.3 to 36.3)
South Asia	44.0	29.6	2.44 (2.05 to 2.91)	37.7 (30.9 to 45.2)
Psychosocial Factors (Stress or Depression)				
Other Countries	84.2	82.0	1.83 (1.58 to 2.13)	19.6 (15.4 to 23.7)
South Asia	86.0	82.6	2.62 (1.76 to 3.90)	16.1 (4.1 to 28.2)
Moderate- or High-Intensity Exercise				
Other Countries	15.8	21.6	0.70 (0.65 to 0.76)	25.2 (20.7 to 29.7) ^a
South Asia	4.6	6.1	0.72 (0.53 to 0.97)	27.4 (11.7 to 51.8) ^a
Alcohol Consumption ≥Once/wk				
Other Countries	25.7	26.9	0.79 (0.74 to 0.85)	15.8 (11.7 to 19.9) ^a
South Asia	13.3	10.7	1.06 (0.85 to 1.30)	-4.6 (-24.1 to 14.7) ^a
Consumption of Fruits and Vegetables >1/d				
Other Countries	38.3	45.2	0.70 (0.65 to 0.76)	12.2 (9.6 to 14.8) ^a
South Asia	20.0	26.5	0.65 (0.53 to 0.81)	21.4 (13.2 to 32.7) ^a

Source: Joshi et al. [24]

^aIndicates that the population attributable risk (PAR) related to South Asia versus the rest of the world is significantly different at the 0.05 level

Table 2

Cited primary articles examining migrant South Asians cultural influences on behaviour change

Author	Methods	Summary	Issues discussed
Tremblay [38]	Sample: 171,513 individuals across 8 ethnic groups who participated in the Canadian Community Health Survey. Method: Cross-sectional questionnaire.	Examined the change in physical activity after immigration in immigrant groups in Canada	Physical activity misconceptions
Astin [44]	Sample: 45 South Asian patients, 37 South Asian care givers, 20 White-European patients, 17 White-European care givers. Qualitative study in the UK using semi-structured individual interviews.	Explored the differences between South Asian and Caucasian patients' family support and family members' roles	Gender roles, cultural identity
Farooqi [45]	Sample: 6 focus groups of 12 South Asians over 40. Qualitative study in UK using focus group analysis.	Explored attitudes towards lifestyle risk factors to identify cultural barriers to behavior change	Gender roles, cultural identity
Kalra [46]	Sample: 8 focus groups of Asian Indians in Northern California. Qualitative study using focus group analysis.	Identified community and cultural factors that influenced approach to CVD prevention by using focus groups to evaluate perceptions regarding CVD risk	Gender roles, cultural identity
Visram [47]	Sample: Individual and focus group interviews with 9 South Asian women participating in a cardiac rehab exercise intervention in a UK community. Qualitative study using semi-structured interviews.	Examined how cultural factors and lack of confidence are barriers to starting cardiac rehab by interviewing staff and clients of a cardiac rehabilitation program	Gender roles
Sriskantharajah [48]	Sample: 15 South Asian women with CHD or diabetes in a UK community. Exploratory qualitative study with semi-structured interviews.	Identified cultural barriers to exercise in interviews with South Asian women	Gender roles, physical activity misconceptions
Lawton [49]	Sample: 32 South Asian patients with diabetes in a UK community. Qualitative study with individual semi-structured interviews.	Explored social and cultural issues that contributed to low physical activity levels in South Asian patients	Gender roles, physical activity misconceptions, cultural priorities
Netto [50]	Sample: 6 focus groups of South Asian men and women in a UK community. Qualitative study with longitudinal action research approach: focus group interviews before and after an action research project.	Discussed the need to address cultural, social, historical, environmental and psychological forces in designing an intervention through focus group interviews	Gender roles, cultural identity
Khanam [51]	Sample: 25 Bangladeshi in East London felt to be overweight by their GPs and referred to a gym. Method: Questionnaire with additional open-ended questions.	Identified cultural beliefs and attitudes that affected approach to physical activity in Bangladeshi women	Gender roles
Abbott [52]	Sample: 6 focus groups of providers who have many Bangladeshi patients. Method: Focus group interviews using semi-structured interviews.	Examined primary care providers' perceptions on how language, religion, and a lack of knowledge impede behavior change	Cultural priorities
Carroll [53]	Sample: South Asian Muslim women in 5 different districts in England and Wales. Method: Qualitative interviews in response to an exercise by prescription intervention.	Identified barriers to exercise in a pilot intervention to promote physical activity in South Asian Muslim women	Gender roles
Grace [54]	Sample: 17 focus groups in a community outside of London. Bangladeshi without diabetes, religious leaders and scholars, and health professionals were interviewed. Method: Qualitative focus group semi-structured interviews.	Explored beliefs and attitudes toward healthy lifestyle choices in British Bangladeshi	Gender roles, cultural identity
Bush [55]	Sample: 259 UK South Asian, Italian, and general population of women. Method:	Explored body image perceptions in South Asian, Italian, and	Body image

Author	Methods	Summary	Issues discussed
Darr [58]	Cross-sectional study using silhouettes to assess perceptions of body image. Sample: 45 South Asians and 20 Caucasians in West Yorkshire, UK admitted to hospital for angina. Qualitative study in UK using semi-structured interviews.	general population of women in the UK Discussed difficulties with behavior change in South Asian and Caucasian patients	Gender roles, cultural priorities, cultural identity, explanatory model of disease
Lawton [61]	Sample: 23 Pakistanis and 9 Asian Indians with type 2 diabetes in Edinburgh, UK Method: Qualitative study using individual semi-structured interviews.	Explored South Asian patients' attitudes toward their traditional diet	Cultural identity
Vallianatos [62]	Sample: Arabic and South Asian women in a small Canadian community. Method: Focus group semi-structured interviews.	Explored the meaning of food to South Asian women and their experiences maintaining ethnic cuisine in a new country	Cultural identity
Stone [63]	Sample: 15 South Asian and 5 Caucasian patients in Leicester, UK Method: Individual semi-structured interviews with diabetic patients.	Examined attitudes and experiences that promote and hinder behavior change in South Asians	Cultural identity
Keval [64]	Sample: 18 Asian Indian type 2 diabetic patients in 3 UK communities. Method: Qualitative study using individual semi-structured interviews.	Explored how South Asians use their life experiences, history, and social and cultural community to manage their medical conditions	Cultural identity
Lawton [67]	Sample: 32 Caucasian and 32 South Asian diabetic patients in Edinburgh, UK Method: Qualitative study using individual, in-depth interviews.	Explored beliefs regarding disease management and self responsibility in Caucasians and South Asians	Explanatory model of disease
Grewal [68]	Sample: 53 South Asians and 509 Caucasians from 2 hospitals in Ontario, Canada. Method: Cross-sectional study using Medical Outcomes Study Social Support Scale and Illness Perception Questionnaire.	Examined perceptions regarding CAD causation in Caucasians and South Asians	Explanatory model of disease
Rhodes [69]	Sample: 12 Bangladeshi diabetic patients in Bradford, UK Method: Qualitative study using individual in-depth interviews	Examined Bangladeshi patients' experiences and struggles interacting with healthcare providers	Explanatory model of disease
Kandula [71]	Sample: 270 South Asians recruited from health centers in the Chicago area. Method: Cross-sectional study using surveys to assess perceptions of CHD.	Explored knowledge and perception of CVD Risk among South Asian immigrants	Explanatory model of disease
Tirodkar [70]	Sample: 75 South Asian patients from a federally qualified health center and community center in Chicago. Method: Qualitative study using individual semi-structured interviews.	Identified cultural, spiritual, physical, and psychosocial influences on beliefs regarding disease causation in South Asian immigrants	Explanatory model of disease