Chapter 9
Diabetes in Culturally Diverse Populations: From Biology to Culture

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Introduction

The constantly evolving nature of modern societies has made many health-care professionals around the world face the challenge of providing optimal health care to people from various racial, ethnic, and cultural backgrounds. In the area of diabetes care, this is of particular relevance due to multiple reasons. First of all, racial and ethnic minorities continue to grow in many countries around the globe. In addition, diabetes affects populations at different rates. Furthermore, the quality of diabetes care provided to minority groups often lags behind that provided to the mainstream group.

Whereas it is true that diabetes care encompasses general guidelines and strategies that may be applicable to most patients, there is an increasing need to understand and tailor approaches at an individual level by considering factors such as race, ethnicity, socioeconomics, culture, education, health literacy level, and lifestyle preferences among many others. The lack of routine assessment and integration of these factors into the development and implementation of a comprehensive diabetes care plan may contribute to suboptimal patient outcomes.

Scientific knowledge in the field of diabetes has grown steadily for a long time. Progress in our understanding of the pathophysiology of the disease, its relationship to other comorbidities, the mechanisms that lead to the development of acute and chronic complications, and how to better treat this condition should be seen as a great accomplishment. However, the translation of this great scientific knowledge into effective and sustained patient self-care practices is far from ideal. Real-world clinical practice is full of challenges. In a general sense, a triad of elements participate in this conundrum.

First, the structure of most health-care systems limits the time and quality of clinical encounters between health-care providers and physicians who also have limited resources of all types to integrate a comprehensive diabetes care team. Second, there is a general lack of skills among us as health-care providers on how to effectively assess and integrate this complex level of non-biological factors into an effective treatment plan. In addition, patients are ultimately responsible for improving self-care practices and many personal and social challenges limit their ability to do so.

This chapter aims at providing the reader with general information on the multiple biological, psychological, social, and cultural factors that may influence the development and course of diabetes in culturally diverse populations. Identifying these elements is the first step toward developing effective clinical care and education strategies.

Race and Ethnicity

Race primarily alludes to shared genetically transmitted physical characteristics by large groups, whereas ethnicity relates to people classed according to common racial, national, tribal, religious, linguistic, or cultural origin or

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background.[1] Therefore, ethnicity alludes to a perceived cultural distinctiveness, expressed in language, music, values, art, styles, literature, family life, religion, ritual, food, naming, public life, and material culture.

A good example to distinguish race from ethnicity is the nature of the Latino or the Hispanic population. The term *Latino* or *Hispanic* relates to ethnicity, not race. Racially speaking, Latinos have three possible genetic backgrounds: white, African-American, and/or Native Indians. These genetic backgrounds are seen in any possible combination among Latinos, creating a very heterogeneous group. However, Latinos have multiple shared linguistic, traditional, and cultural values.

Culturally Diverse Populations in the United States

Although white Americans account for three-quarters of the US population, increasing numbers of other racial and ethnic groups contribute to making many cities a true mosaic of heterogeneous cultures. The minority groups with the highest numbers of people in the United States are Latinos/Hispanics, African-Americans, American Indians, Alaska natives, Asian and Pacific Islanders, Southeast Asians, and Arabs. Most of these groups will continue to increase at a higher rate than the non-Hispanic white population. Table 9.1 shows the current and projected increase in the distribution of the US population by race and ethnicity according to the US census data.[2]

Table 9.1 Current and projected percentage of the US population by race and ethnicity from the year 2000 to 2050

Population or percent and race or Hispanic origin	2000	2010	2020	2030	2040	2050
Total	100.0	100.0	100.0	100.0	100.0	100.0
White alone	81.0	79.3	77.6	75.8	73.9	72.1
Black alone	12.7	13.1	13.5	13.9	14.3	14.6
Asian alone	3.8	4.6	5.4	6.2	7.1	8.0
All other races	2.5	3.0	3.5	4.1	4.7	5.3
Hispanic (of any race)	12.6	15.5	17.8	20.1	22.3	24.4
White alone, not Hispanic	69.4	65.1	61.3	57.5	53.7	50.1

Health-Care Disparities

Unfortunately, minority groups have lagged behind in their health care when compared to the predominant group in the United States, as it may happen in other areas around the world. The Institute of Medicine, a private, nonprofit organization that provides health policy advice under a congressional charter granted to the National Academy of Sciences, clearly demonstrated that racial/ethnic minorities have a lower quality of health care than do the mainstream white population. Some of the evaluated outcomes are pertinent to the area of diabetes care.[3] These disparities persist after controlling for level of access to care, socioeconomic status, age, stage of presentation, or existing comorbidities and can be found in multiple health-care settings (e.g., managed care, public, private, teaching, and community centers).[3] This is a complex phenomenon with multiple elements. Two different worlds, that of the patient and that of the health-care provider, usually collide in clinical encounters in a health-care system that is often not conducive to recognize and address cultural differences. Limited cultural awareness on both the health-care provider side and the patient side interferes with an effective clinical encounter. It is highly possible that health-care disparities are not the result of intentional discrimination but due to the lack of effective skills and strategies to interact with people from a different cultural background from our own. In addition, there seem to be some biological differences among culturally diverse populations that may influence the development and course of type 2 diabetes.

The Development of Type 2 Diabetes: Biology and/or Culture?

The prevalence of type 2 diabetes in racial/ethnic minorities has consistently been reported as higher than that in non-Hispanic whites.[4–7] The incidence of type 2 diabetes has also been reported as higher in racial/ethnic minorities in a 20-year follow-up of the Nurses' Health Study.[8] The prevalence of type 1 diabetes is usually about the same or even lower in some of these groups when compared to mainstream groups.

Type 2 diabetes is a heterogeneous disease that results from the combination of genetic predisposition and environmental factors (Fig. 9.1).

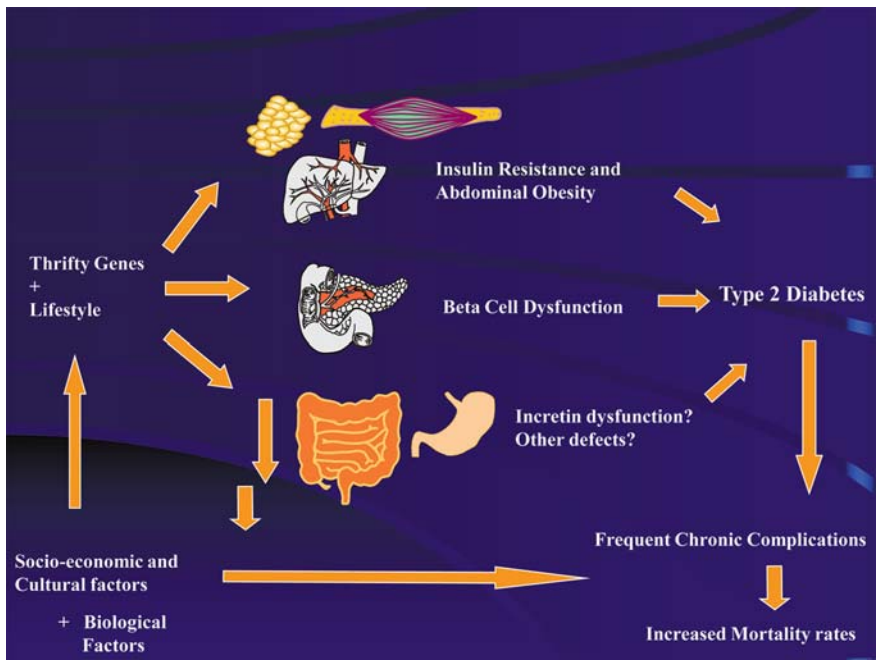

Fig. 9.1 Genes, environment, and social/cultural factors in the development and course of diabetes in culturally diverse populations

The Influence of Biology

Many studies have shown that the minority groups have a strong genetic predisposition for the development of type 2 diabetes. The "thrifty gene" theory has emerged as a possible explanation for this genetic tendency to diabetes. This theory, first proposed by J.V. Neel in 1962, suggests that populations of indigenous people who experienced alternating periods of feast and famine gradually adapted by developing a way to store fat more efficiently during periods of plenty to better survive famine.[9] It is postulated that this genetic adaptation has now become detrimental since food supplies are more constant and abundant, leading to an increased prevalence of obesity and type 2 diabetes in certain populations. Despite the significant amount of research aiming at identifying the precise nature of the "thrifty gene or genes," no uniform genes across ethnic groups have been identified to fully support this theory.[10] It is possible that the genetic basis of the thrifty genotype derives from the multiplicative effects of polymorphisms in multiple pathways such as those involved in insulin signaling, leptin activity, intermediary fat metabolism, and even peroxisome proliferator-activated receptors.[10]

Insulin Resistance/Insulin Secretion

A study in young, healthy Mexican Americans, African-Americans, and Asian-Americans showed that insulin sensitivity was lower in these groups than in whites.[11] None of these people had diabetes and had a similar body

weight, reducing the influence of potential factors that could influence the data.[11] In addition, these differences have been shown in youngsters from some of these racial and ethnic minorities, such as Hispanic American and African-American children, even after adjustment for differences in body fat.[12] Furthermore, the associated compensatory responses to increased insulin resistance may differ across these ethnic groups, suggesting that the underlying pathology of diabetes may indeed vary in high-risk ethnic subpopulations.[12] It is postulated that most racial/ethnic minority groups in the United States, such as Latinos or Hispanics, African-Americans, Asian-Americans, South East Asians, American Indian, and Alaska Natives as well as Arab Americans have higher rates of insulin resistance than do the general white population.[13] In addition, it is highly possible that β-cell function in all these groups is more likely to fail over time, which, in conjunction with insulin resistance, leads to type 2 diabetes.[14–18] However, more research is required in this area to identify the precise mechanisms that account for these potential differences.

Obesity/Fat Distribution

Another interesting biological difference among racial/ethnic groups is that related to obesity and in particular, the tendency to accumulate intra-abdominal fat. Abdominal obesity plays a major role in the development of type 2 diabetes and cardiovascular disease. In particular, visceral fat is related to insulin resistance and endothelial dysfunction.[19] Abdominal obesity contributes to insulin resistance and thus to type 2 diabetes and may also impair beta cell function (Fig. 9.1).[20,21]

Obesity continues to be on the rise. The age-adjusted prevalence of obesity was 30.5% in 1999–2000 compared with 22.9% in 1988–1994 in the National Health and Nutrition Examination Survey (NHANES III) ($P < 0.001$). The prevalence of overweight also increased during this period from 55.9 to 64.5% ($P < 0.001$). Extreme obesity (BMI $\geq$ 40) also increased significantly in the population, from 2.9 to 4.7% ($P = 0.002$).[22] An increased rate of obesity was appreciated for non-Hispanic whites, non-Hispanic blacks, and Mexican Americans. Racial/ethnic groups did not differ significantly in the prevalence of obesity or overweight for men. However, among women, the prevalence of obesity and overweight was highest among non-Hispanic black women. More than half of non-Hispanic black women aged 40 years or older were obese and more than 80% were overweight.[22] The proportion of African-Americans and Non-Hispanic whites with abdominal obesity is higher than in whites.[23]

In addition, most minority groups in the United States tend to accumulate more visceral fat than do whites, at any degree of obesity.[13] In African-Americans, there seems to be a reduced content of visceral fat when compared to whites of the same BMI.[24] However, it is still unclear as to whether there is truly a consistent reduction in visceral fat content in this group. In other groups such as South East Asians, visceral fat content has been shown to be higher than that in Caucasians of similar BMI.[25] Therefore, a common clinical picture can be an individual that is not necessarily obese according to usual standards but due to the tendency to accumulate abdominal and visceral fat, insulin resistance and increased risk for type 2 diabetes and cardiovascular disease may exist.[19,20] In fact, the definition of abdominal obesity is race/ethnicity dependent. Different cutoff levels are required in each population around the world.[26]

Furthermore, obesity is also increasing among youngsters in many areas of the world. We recently reported that normoglycemic overweight Hispanic/Latino children have profound endothelial dysfunction and subclinical vascular inflammation in association with body fat and insulin resistance (Table 9.2).[27] Therefore, this high-risk group has not only a significant risk for type 2 diabetes but perhaps for cardiovascular disease as well.

Environmental or Acquired Factors

Environmental factors have undoubtedly contributed to increase in the risk for obesity and diabetes in racial/ethnic minorities (Fig. 9.1). Many of these groups are immigrants to the United States and other countries. Immigrants may have higher rate of type 2 diabetes than do mainstream groups, with multiple lifestyle

Table 9.2 Comparative metabolic and vascular function parameters in overweight vs. lean Hispanic children and adolescents. Constructed from reference[27]

Variable	Controls ($n = 17$)	At risk ($n = 21$)	P value
Age	14.18 ± 2.3	13.33 ± 2.7	0.31
Gender F/M	9/8	10/11	0.746
Percentile BMI	34.8 ± 15.4	97.1 ± 3.5	< 0.0001
Trunk fat	19 ± 5	42 ± 9	< 0.0001
Triglycerides	58.82	108.29	0.004
FPG (mg/dl)	89 ± 4	91 ± 6	0.334
HOMA-IR	2.30 ± 1.1	6.23 ± 3.9	< 0.0001
sICAM (ng/ml)	259.5 ± 60	223.2 ± 47.5	0.047
TNF-α (pg/ml)	2.57 ± 1.1	1.74 ± 0.6	0.008
hs-CRP (mg/l)	2.0	0.13	< 0.0001
PAI-1 (ng/ml)	47 ± 35.7	12 ± 5.2	< 0.0001
tPA (ng/ml)	6.1 ± 1.9	4.1 ± 0.8	0.001
Adiponectin (μg/ml)	8.7 ± 3.3	12.6 ± 5.2	0.022
WBC count ($\times 10^3$)	6.9	5.3	0.031

issues contributing to this phenomenon.[28–31] The common elements of "westernization" that increase the risk for obesity, diabetes, and related diseases include a diet higher in total calories and fat but lower in fiber and a reduced need to expend energy because of labor-saving devices. In addition, particular aspects of preferred foods and lifestyle practices in each of these groups certainly play a role in the development of diabetes and its treatment.[28–31] Cultural factors that influence some of these lifestyle aspects will be discussed in more detail in other sections of this chapter (Table 9.3).

Table 9.3 Main factors to be considered in a culturally oriented clinical encounter and/or education program in patients with diabetes mellitus from diverse racial and ethnic groups

Acculturation
Body image
Cultural awareness
Depression
Educational level
Fears
General family integration and support
Health literacy
Individual and social interaction
Judgment about the disease
Knowledge about the disease
Language
Myths
Nutritional preferences
Other forms of medicine (alternative)
Physical activity preferences
Quality of life
Religion and faith
Socioeconomic status

Diabetes-Related Complications

Unfortunately, minority populations not only develop type 2 diabetes more frequently but also exhibit higher rates of diabetes-related complications than do their white counterparts. Consistent data have emerged from multiple studies showing higher rates of retinopathy, nephropathy, peripheral vascular disease, leg amputations, and cardiovascular disease among many of these groups.[13] For some complications, like chronic kidney disease,

some specific factors, such as very high rates of hypertension in African-Americans, partially explain these differences. It is still unclear whether certain biological factors consistently increase the risk of complications in minorities. However, some recent data suggest that glycemic control is particularly poor in some of these groups. The National Health and Nutrition Examination Survey study has shown higher hemoglobin A1c levels among Hispanics, represented by Mexican Americans, and in African-Americans when compared to the white population.[32] Clearly, poor glycemic control contributes to the increased risk of diabetes-related complications.

Social and Cultural Factors

Some of the most relevant social and cultural factors that influence the development and/or the course of type 2 diabetes in culturally diverse populations are listed in Table 9.3. These factors have been arranged in alphabetical order, not in order of importance. Some important factors may therefore be included in another category for simplicity. The primary purpose of the list is to guide the reader as to the multiple factors that may need to be addressed in the day-to-day management of patients with type 2 diabetes.

Acculturation

Culture refers to the behavior patterns, beliefs, arts, and all other products of human work and thought, as expressed in a particular community.[1] *Acculturation* refers to the adoption of some specific elements of one culture by a different cultural group.[1] For immigrants to the United States, it relates to the integration of multiple preferences and behaviors from mainstream culture. No uniform instrument to assess acculturation exists. Self-identification, behavior, and language skills are common elements that may allow classification of individuals into the above categories. Many reports consider language preference as a good estimate of the degree of acculturation of any given individual.[33] Whereas conflicting results exist in the literature as to whether high acculturation translates into better or worse health-care behaviors, some reports point to the fact that groups with low acculturation are more likely to be without a routine place for health care, have no health insurance, and have low levels of education.[34–37] These factors are clearly related to health-care outcomes. At the same time, a high acculturation level can also be associated with higher rates of DM, perhaps through the adoption of a more "diabetogenic" lifestyle, that is, by eating larger portions of foods rich in carbohydrates and fats and by becoming more sedentary.[33–37] It is also true that the acculturation process can lead to the adoption of a healthier lifestyle. Ultimately, individuals choose what behaviors and preferences to adopt. Health-care providers should openly ask patients about behaviors that they have adopted from mainstream culture.

Body Image

The concept of ideal body weight may vary among individuals within and across racial and ethnic groups. Although it would be erroneous to assume that some people prefer to be overweight, the ideal weight that people have conceptualized may be different. In some groups, like Hispanics, African-Americans, some American Indian tribes, and some Arab groups, being robust and slightly overweight has been considered equivalent to being well nourished and financially successful.[13] Children are often encouraged to "eat well" and finish their entire meal. For some groups, achieving a higher socioeconomic status translates into the possibility of eating more, not necessarily eating better. As an example, a study in African-American women with type 2 DM showed that most participants preferred a middle-to-small body size but indicated that a middle-to-large body size was healthier.[38] They also said that a large body size did result in some untoward social consequences. In a recent study in overweight African-American girls, the findings imply that perceptions of weight and healthy lifestyle behaviors are largely determined by environmental and personal influences.[39] When discussing weight-loss strategies, it is therefore crucial that clinicians ask patients about their personal goals.

Cultural Awareness

This element applies to both the patient and the health-care provider. Being aware of how our own culture influences our thoughts, beliefs, and behaviors and respects the fact that others may see the world in a completely different way is the first step toward efficient personal interactions. Cultural competence is defined by the American Medical Association as the knowledge and interpersonal skills that allow health-care providers to understand, appreciate, and work with individuals from cultures other than their own. It involves an awareness and acceptance of cultural differences, self-awareness, knowledge of the patient's culture, and adaptation of skills.

Although no randomized clinical trial has been conducted to demonstrate that diabetes control and/or complication rate are improved by a group of health-care providers with higher cultural competence compared with a group with a lower level, it seems clear that cultural competence can lead to a much more pleasant and productive health-care provider–patient interaction.[40] In the field of DM, it may be particularly relevant because disease control is greatly determined by effective lifestyle and behavior modification. The need to improve the skills of health-care providers in the area of cultural competency has been recognized more than ever before and some interesting studies are starting to emerge.[41] Several states in the United States now require physicians to obtain some annual continuing medical education credits in programs addressing cultural aspects in health care. It is anticipated that more states will join the effort to disseminate accurate information on how to improve the lives of people with DM from various cultures.

Unfortunately, many health-care providers blame the patient for not following a treatment plan. It is disappointing to hear many professionals refer to patients as *noncompliant.* Although it is true that some patients may not adhere to their treatment plan, perhaps it is more helpful to say: "I have not found the best way to interact with my patient so that some specific behavioral changes occur."

It is common to create stereotypes in clinical encounters. However, creating a stereotype about a patient based on his or her racial/ethnic or cultural background is likely to endanger the clinical encounter. It is helpful to be aware of the most common cultural aspects that may influence DM care in any group, but a productive clinical encounter must focus on a particular patient's characteristics and preferences.

On the other hand, patients also need to raise their cultural awareness. In the same way that providers need to understand patients' values and beliefs, so do patients. Although this may be a more challenging task, it may happen naturally as the result of a better and more culturally oriented interaction with health-care providers.

We all have a culture. Therefore, it is important to be able to interact with people within the same and other cultures in a respectful and efficient way. Being aware and sensitive to the impact of culture on diabetes care is the first step. Cultural competence/awareness is highly needed in diabetes care.[42]

Depression

Depression is frequently associated with diabetes. In addition, it is a powerful predictor of poor diabetes-related health outcomes.[43] Multiple factors may account for this association, including low socioeconomic status, lack of family and social support, and sense of isolation, many of which are more common in some ethnic groups, particularly those that have immigrated to the United States.[33–37] In addition, ethnicity is also related to poor glycemic control, which is related to poor clinical outcomes that may exacerbate depression.[32,44] Therefore, a vicious cycle that includes diabetes and depression is very common among patients with diabetes from culturally diverse populations. The presence of depression also influences adherence to any DM treatment plan.[44] Some immigrants to the United States may be more likely to develop stress and depression because of the need to live in, and adapt to, a completely different social and cultural environment. A recent study showed that Puerto Rican elders in Massachusetts are significantly more likely to have physical disability, depression, cognitive impairment, DM, and other chronic health conditions than are non-Hispanic white elders living in the same neighborhoods.[45] Depression is one of the most frequently missed diagnoses in clinical practice.[46] Health-care providers should become familiar with various ways of assessing the presence of depression in their patients.

Although specific scales are useful in assessing depression in specific cultural groups, some general approaches may also be useful in regular clinical encounters.[47] For instance, specific questions such as "Have you felt depressed or sad much of the time this past year?" may provide insight into whether a patient may be depressed.

The evaluation of emotional distress in the patient with diabetes is also crucial for today's effective clinical care.[48]

Educational Level

Some data show that a higher educational level may be related to better diabetes-related outcomes.[49] For instance, the association of educational level with either type 2 DM or CVD was examined in a sample of second-generation Japanese-American men living in King County, Washington. Men with a technical school education showed higher frequencies of both diseases compared with men with any college education or high-school diplomas. The association of educational level with risk of type 2 DM was not explained by other factors, such as occupation, income, diet, physical activity, weight, insulin, lipids, and lipoproteins, whereas the association with CVD was explained in part by the larger average body mass index (BMI), higher total and very-low-density lipoprotein, triglycerides, and lower high-density lipoprotein (HDL) and HDL-2 cholesterol observed in men with technical school educations compared with the other men.[49] Therefore, a low educational level may not be the direct cause of poor outcomes in patients with type 2 DM, but rather a "marker" of multiple socioeconomic and cultural factors that may influence adherence to treatment and the course of the disease.

Another study showed that lower socioeconomic and educational levels are strongly associated with being overweight or obese.[50] However, not all studies have identified educational level as a crucial element to determine responses to lifestyle modification interventions.[51]

It is recommended that health-care providers take into consideration patients' educational level when implementing any educational activity, whether in a regular clinical encounter or through a group DM education program, since it may lead to the identification of other important social and cultural factors that may influence diabetes care.

Fears

Patients may have multiple fears that may influence their adherence to a DM treatment plan. Many patients fear the presence of type 2 DM and its complications. This fear, expressed by a sense of hopelessness, may be due to lack of adequate information about the disease. On the other hand, in some patients, a sense of fear may lead to a more responsible attitude toward the disease and improve self-management behavior.[52]

Another common fear in patients with type 2 DM, particularly in some ethnic groups, is related to the consequences of medications. For instance, insulin use is considered by many as a treatment of last resort that equals the development of severe diabetes-related complications, such as going blind and ultimately dying of the disease. It is perceived as basically a death sentence and reduces patients' likelihood of following a good treatment plan.[53] This concept may be more prevalent in some groups. Our own experience in the Latino Diabetes Initiative at the Joslin Diabetes Center, Boston, Massachusetts, confirms that this fear is common among Latinos. In a recent analysis of our data, approximately, 43% of new patients to our program thought that insulin causes blindness and 25% were not sure whether this was true or not.[54] The basic implication of fear for DM care is quite obvious. Before prescribing medicine, health-care providers should openly ask patients if they have any particular fears about taking insulin or any other diabetes medication. As an anecdotal experience, a few years ago I saw a patient who, according to notes by his primary care physician, had been taking insulin for several years. When referred to us for uncontrolled DM, one of my first questions to him was: "Are you taking your insulin injections?" He openly said to me: "Claro que no, doctor!" (Of course not, doctor!) "No quiero quedarme ciego por usar la insulina" (I don't want to get blind from taking insulin!) Unfortunately, and as happens frequently with many patients, he had already developed severe complications. Both his legs were amputated within

1 year, and he died of a cardiovascular event within 2 years. A very simple question before starting a patient on insulin can be the first step to overcome this common fear to insulin.[55,56] Among Asian-Americans, the effect of substances in the body may be referred as "cold" or "hot." Sometimes, medications that produce "hot" reactions may not be well accepted. For instance, some patients may associate these reactions to those of hypoglycemia, due to the accompanying adrenergic burst. It is then imperative to ask and address these issues with the patients.

General Family Integration and Support

Although family is important for virtually all human beings, the level of closeness and dependence between family members may differ in various populations. In general, some groups such as Latinos, Arabs, Asian Indians, and others often exhibit a collective loyalty to the extended family or the group that supersedes the needs of the individual.[57] This loyalty may provide pros and cons in diabetes care. The benefit is that more members in any given family may provide support to the patient. Some reports suggest that structural togetherness in families is positively related to DM quality of life and satisfaction among patients with DM.[58,59]

The downside is that it is more difficult for some patients to make their own decisions. Nevertheless, openly offering the patient to bring along family members to the clinical encounters may be a good start to address this factor. Inviting relatives to group education activities has been reported as a successful strategy in several groups.[59]

Health Literacy

Health literacy is defined as the degree to which individuals have the capacity to obtain, process, and understand the basic health information and services they need to make appropriate health decisions. Knowing a language is not a guarantee of high health literacy, although it certainly plays a role.

Limited health literacy, common in patients with both type 1 and type 2 DM, has been associated with worse DM outcomes.[60] A particular association that may influence the development of specific DM outcomes is that of health literacy with DM self-management behaviors, as assessed in a population of patients with type 2 DM.[61] Self-management behaviors can be improved in people with low as well as high health literacy.[62] Furthermore, a recent study showed that self-efficacy was associated with self-management behaviors across Asian/Pacific Islanders, African-Americans, Latinos, and white Americans with various degrees of health literacy.[63]

Ideally, specific low-health-literacy patient education programs and materials should be developed for each racial and ethnic group.[64] Health-care providers should evaluate their patients' health literacy levels when implementing a DM education program or even when providing regular patient education materials.[65] There are various ways to evaluate health literacy. A common instrument used for this purpose is the test of functional literacy in adults.[66] The reader may want to become familiar with this instrument as a starting point to formally evaluate patients' health literacy.

Individual and Social Interaction

Every individual has a unique character and personality and different approaches to interacting with other people. There is no right or wrong about how various cultures approach this issue. Each group may just be different. For instance, many Latino patients expect to develop a warm and personal relationship with their physicians.[67] This type of patient–physician relationship would be characterized by interactions that occur at close distances and emphasize physical contact, such as handshakes, a hand on the shoulder, and even hugging under certain circumstances. Some Latino patients with DM may erroneously think that their health-care provider does not care about them if they do not experience this type of interaction. Even though health-care providers cannot easily switch behaviors as they interact with patients with diverse backgrounds and cultures, keeping in mind

that certain groups prefer particular approaches may facilitate clinical encounters and help establish a more trusting and effective relationship with patients.

Judgment and Beliefs About the Disease

Every social group shares beliefs about health and illness. Groups and individuals may have a particular DM explanatory model of illness. Knowledge and understanding of these health beliefs and explanatory models are essential for effective clinical encounters and education programs. Some beliefs related to the development of DM include heredity, eating sweets, stress, emotional instability, and, sometimes, even an acute episode of fear or anxiety.

A recent study explored some health-related beliefs and experiences of African-American, Hispanic/Latino, American Indian, and among people with DM.[68] The investigators found that many participants attributed their loss of health to the modern American lifestyle, lack of confidence in the medical system, and the general lack of spirituality in modern life. Interestingly, participants recommended improvements in the areas of health care, DM education, social support, and community action that emphasized respectful and knowledgeable health-care providers, culturally responsive DM education for patients and their families, and broad-based community action as ways to improve DM care and education programs.[68]

Health-care providers should explore beliefs about the development and course of DM with their patients. A simple question to start with is: "Why in your opinion, did you develop DM?" This initial evaluation may guide the clinician on what important factors to address with that patient.[67]

Knowledge About the Disease

Patients' knowledge of DM is usually associated with self-management behaviors but not necessarily or directly associated with DM-related outcomes.[61] However, because improving self-management behaviors is likely to lead to better DM control and, hence, a lower risk of DM complications, general knowledge of DM will continue to be an important aspect of DM education programs.[69–71] Culturally oriented programs should focus on improving patients' knowledge of DM that can specifically help them improve those self-care management behaviors that may be more problematic in specific population groups.[69–71] Specific culturally oriented programs to improve self-management behaviors are necessary.

Language

The most obvious "cultural" barrier in a clinical and educational encounter is the inability to communicate in the same language. It may limit the patient's ability to ask questions, to verbalize important information and concerns, and to establish a natural and spontaneous relationship with the health-care provider. Language has been shown to affect clinical outcomes and may be a serious barrier to effective patient care.[72]

In general, patients prefer health-care providers who have a similar ethnic background. It may improve compliance and follow-up.[72] However, there is currently a pronounced discrepancy between the number of physicians who can communicate in both English and an additional language and the number of non-English-speaking patients. For instance, in 1999, Latino physicians accounted for ~3.3% of practicing physicians in the United States; however, 13.9% of the patient population is of Latino origin.[73] Therefore, the proper use of interpreters is necessary.[74] A word of caution is necessary concerning the common circumstance in which a family member acts as an interpreter during routine clinical encounters. The advantage to this scenario is that the family member may be able to provide additional helpful information to the health-care provider. The disadvantage is that the family member may not be objective about translating all information, may not put aside his or her emotional attachment to the patient, and may communicate only what he or she considers important.

Health-care providers should find the best translating option(s) for their patients. Although speaking the same language facilitates the clinician–patient interaction, other elements (e.g., trust, genuine interest, and honesty) have no language barriers.

Myths

Myths, which are generally not explicit and are usually interwoven with values and beliefs, are common in patients with DM. Such myths include those related to why DM has occurred or why it has taken a specific course. In some groups, a clear link with faith and religion is present.[67] There are many possible myths about the origin of diabetes: – that DM occurs from eating a lot of sweets, is the result of destiny, is caused by lack of faith, or is punishment for a particular action.[75] Certain myths and fears have developed in relation to insulin use, as discussed above.[67,75]

Health-care providers should ask patients about possible myths and be respectful of patients' answers. Understanding what myths patients believe can help clinicians develop specific strategies to dispel them.

Nutritional Preferences

Humans are biologically adapted to their ancestral food environment, in which foods were dispersed and energy expenditure was required to obtain them.[9,10] The modern developed world has a surplus of very accessible, inexpensive food. Unfortunately, this food is usually rich in carbohydrates and saturated fats. Minority populations in the United States have a high risk of developing type 2 DM, partly due to a strong genetic predisposition.[4–8,13] Because more people are incorporating unhealthy foods in their regular meals, eating continuously larger portions, and not engaging in regular physical activity, rates of obesity, type 2 DM, and CVD are rising.[7]

Although similarities between racial and ethnic groups exist, different groups have different food and nutritional preferences. In fact, foods may be so diverse that considerable discrepancies may exist in subgroups in each general racial/ethnic group, such as in Asians (i.e., Japanese, Chinese, Korean, Hawaiian) or Hispanics/Latinos (i.e., Caribbean, Mexican American, Central American, and South American). Food preferences even vary by country or region in each of these subgroups. For instance, food preferences in Venezuela may differ from those in Colombia, and those in the Dominican Republic may differ from those in Puerto Rico.[67]

Food is usually at the core of family and social interaction. It is certainly worthwhile addressing this aspect in detail with the patient with diabetes. Clinicians must identify local educational resources to help their patients receive culturally oriented medical nutrition therapy. Bicultural dieticians are an excellent resource for physicians. In addition, patient education materials in this important area of nutrition may be identified through national organizations such as the American Diabetes Association, the National Institutes of Health, and the National Diabetes Education Program. Some specific programs, such as the Latino Diabetes Initiative and the Asian American Initiative at Joslin Diabetes Center, can also provide some helpful information.

Other Types of Medicines (Alternative)

Many patients with DM combine alternative and traditional medicine. Alternative medicine has long been part of most cultures throughout the world. The most common forms of alternative medicine are herbs, chiropractic care, yoga, relaxation, acupuncture, ayurveda, biofeedback, chelation, energy healing, Reiki therapy, hypnosis, massage, naturopathy, and homeopathy. A recent report showed that of 2472 adults with DM included in the study, 48% used some form of alternative medicine.[76] Interestingly, this study found that the use of alternative medicine was associated with increased likelihood of receiving preventive care services and increased emergency department and primary care visits.[76] This association does not necessarily represent causality. In other words, alternative medicine use may represent a factor that leads to a more proactive health-care behavior and use of

conventional medical services in adults with DM; conversely, high use of conventional medical services may lead to increased use of alternative medicine.[77] It is estimated that at least a third of patients with diabetes use some dietary supplements.[78] Information on the effect of alternative medicine on diabetes care is starting to emerge. For instance, a recent study showed that yoga may have a positive influence on BG and lipid levels after a short period of practice in some patients with diabetes.[79] Obviously, more research on alternative medicine use in patients with DM is needed. Health-care providers should not forget to ask patients if they are using any form of alternative medicine. This question should be asked in a sensitive and respectful manner so that patients do not feel threatened or embarrassed.

Physical Activity

The nationwide prevalence of leisure-time physical inactivity for adults in the United States has declined on an average of 0.6% per year during an 11-year period. Many adults continue to have minimal or no physical activity.[80] Among racial/ethnic groups, prevalence of physical inactivity was 18.4% for non-Hispanic white men, 27% for non-Hispanic black men, and 32% in Hispanic men. In women, corresponding figures were 33.9% for non-Hispanic black women, 39.6% in Hispanic women, and 21.6% in white women.[80]

Physical activity preferences may vary among racial and ethnic groups. For instance, older white Americans may prefer jogging or going to the gym; older Latinos may prefer activities such as walking or dancing.[67,81,82] When prescribing an exercise program, physicians and patients should discuss preferred physical activities to enhance continuity.

Further research is needed to identify attitudes toward, and barriers to, physical activity in specific ethnic and racial groups. This type of research may help the development of community culturally oriented programs that, in combination with the availability of accessible facilities and transportation options, may motivate people from certain racial/ethnic populations to engage in regular physical activity.

Quality of Life

Type 2 DM has significant adverse effects on health-related quality of life. The effect of DM on reducing health-related quality of life has also been evaluated and confirmed in multiethnic populations.[83,84] Some factors, such as family structure and support, may improve quality of life in patients with DM, as shown in a study of African-Americans.[59]

Although a patient's quality of life is difficult to routinely assess in clinical practice, health-care providers should try to explore how DM and its complications have affected a patient's quality of life. Quality of life clearly influences patients' behavior, receptiveness to treatment, and adherence to a treatment plan.

Religion and Faith

Religion and faith influence daily life. Religious traditions are expressions of faith in, and reverence for, specific conceptions of ultimate reality. They express one's place in, and relation to, this reality. Ultimate reality may be known as God, Allah, Atman, or Nirvana or by many other names, and it is understood and experienced differently by each religious tradition. The forms of faith and the reverence of a tradition may be expressed and experienced through sacred stories; sacred symbols and objects; sacred music, art, and dance; devotion; meditation; rituals; sacred laws; philosophy; ethics; calls to social transformation; relationship with spirits; and healing.[85]

Some of these expressions may affect the health-care arena. In DM care, a clear example of one important influence is the fasting during the daylight hours that Muslims practice during 1 month each year. This practice requires the health-care provider to show cultural sensitivity and understanding by adjusting any treatment strategies during this time.[86]

For a health-care provider to address the topic of religion and faith, two sets of skills are indispensable. The first involves cultivating self-awareness and reflecting on the components of one's own identity. The second involves learning strategies for talking with patients about this topic and for responding to what patients say.

Socioeconomic Status

Poverty influences not only the development of type 2 DM but also complications of DM.[87–89] A recent study showed that family poverty accounts for differences in diabetic amputation rates of African-Americans, Hispanic Americans, and other persons aged ≥50 years.[88] Place of birth and time in the United States are factors closely related to socioeconomic status, and these two factors may have a direct effect on specific diseases.

For instance, The Multi-Ethnic Study of Atherosclerosis, a population-based study of coronary calcification assessed through a CT scan in a large number of non-Hispanic white Americans, non-Hispanic blacks, Hispanics, and Chinese residing in the United States, found that not being born in the United States was associated with a lower prevalence of calcification in blacks and Hispanics after adjustment for age, sex, income, and education.[89] Years in the United States was positively associated with prevalence of calcification in non-US-born Chinese and non-US-born blacks. Low education was associated with a higher prevalence of calcification in white Americans but a lower prevalence of calcification in Hispanics. US birth and time in the United States were also positively associated with the extent of calcification in persons with detectable calcium.

These differences did not appear to be accounted for by smoking, BMI, LDL and HDL cholesterol, hypertension, and DM.[89] Therefore, multiple socioeconomic and acculturation factors in various racial and ethnic groups seem to be related to the development and progression of various metabolic and vascular conditions. From a practical perspective, health-care providers should always consider their patients' socioeconomic status when understanding the presence of various disease processes and when implementing any treatment plan.

Conclusions/Summary

Many clinicians around the world currently face the challenge of providing care to patients from diverse racial/ethnic populations. The main aspects of diabetes care, including general guidelines and therapeutic approaches, do not need to be distinguished by race and ethnicity. However, as we learn more about biological, medical, social, and cultural differences among patients from different populations, an increasing need to consider them into the development of a comprehensive and culturally oriented treatment plan is evident. Such an approach may result in more effective strategies to improve diabetes care to the most vulnerable populations.

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