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Influences on Diet, Health Behaviours and Their Outcome in Select Ethnocultural and Religious Groups

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ABSTRACT

Diverse cultural components of behavior may have significant impacts on patterns of eating, drinking, and social interaction, irrespective of socioeconomic status. For example, the major world religions prescribe or proscribe specific dietary behaviors; some of these are rooted in historical or geographical origins as well as group folklore; and they have integral roles as expressions of religious piety and group cohesiveness. The literature is replete with ecological observations of between-country differences in disease trends, some of which have been associated with dietary practices. The study of distinct cultural and religious groups (especially migrants acculturating to new environments) and the extent to which they adhere to culturally-based dietary precepts, has advanced our knowledge of psychosocial influences on food habits, nutritional adequacy, and overall health. However, a relatively small proportion of culturally-based research studies conducted to date have explored cross-cultural, ethnic, or religious variables. This paper reviews some population-based differences in dietary habits and other behaviors by ethnocultural group or religious denomination; health consequences and suggestions for future research are discussed. *Nutrition* 1998;14:223–230.

Key words: diet, culture, religion, ethnic groups, health behaviors

INTRODUCTION

Food behavior has social and cultural connotations resulting from acquired knowledge as well as carefully selected and maintained traditions,[1–4] so that food has historically been intimately woven into the life fabric of a society.[5] Despite difficulties associated with precise and accurate assessment of dietary determinants and outcome,[1] it is important to consider the symbolic value of foods when studying eating behaviors because foods reflect and are influenced by the cultural categories expressed by a society.[6–7]

North American dietary studies have only recently begun to systematically explore dietary attributes of minority groups such as blacks, Hispanics, or Native Americans.[8–12] These data are becoming essential for addressing minority health issues. In both North America and Europe, accelerated waves of migration have occurred in the last 20 to 25 years, with cultural groups from countries in Africa, Southeast Asia, the Near East, and the Far East, among others, migrating to western countries. Since 1990, striking political changes in Europe have seen many move from East to West. Few dietary studies have been conducted among these groups in their new environments, although there is ample historical—as well as current—evidence of dietary acculturation among the children of migrants.[13–15] The proliferation and consumption of "ethnic" foods alongside the more traditional fare in most North American cities should be seen as clear testimony to the culinary influence of numerous cultures in western society today.

The present overview aims to encourage health professionals to be more aware of cultural influences on their clients' health, and to stimulate further research in the area of cross-cultural determinants of dietary and other health behaviors. Concepts from two complementary disciplines—nutritional anthropology and nutritional epidemiology—will be explored, using selected historical and current research sources. A sampling of studies spanning the last two decades will illustrate some of the issues discussed and address implications for future research which seeks to diminish risk for chronic diseases.

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FOOD HABITS AND HEALTH

While the specific reasons for widespread and persistent social differences in health and disease are unknown, they are believed to result from differing socio-environmental factors between populations, as well as individual genetic and lifestyle differences within populations. Cultural influences on behavior may affect dietary patterns and social relationships, independent of material conditions.[16] Indeed, a contributory nutritional etiology has been suggested for most chronic diseases.[17] For example, coronary heart disease has been related to a diet high in energy, total fat, and animal fat, contributing an excess of saturated fats and cholesterol.[18] Hypertension may be influenced by an overconsumption of salt in susceptible individuals.[19] On the other hand, risk of osteoporosis, particularly in white postmenopausal women, may be exacerbated by insufficient consumption of calcium-rich foods during childhood and adolescence.[20] While diet-cancer relationships are less well-defined, excesses or insufficiencies of various nutrients have a purported role in the etiology of various cancers. However, while promising research consistently stresses the importance of fruit, vegetables, and dietary fiber in cancer prevention,[21] it is not yet known what constituent(s) in these foods are singly or synergistically responsible for the observed effects.[22–25]

For some years, investigators have attested to the relationship between food habits and cardiovascular diseases in different national groups; case-control and cohort studies on the epidemiology of circulatory diseases have shown that disease prevalence, incidence, and mortality may differ greatly from one population to another.[26] It is thought that the differences observed are partially due to aspects of lifestyle (such as dietary habits), as well as other characteristics specific to the groups studied.[27–31] Environmental change favoring higher levels of consumption of saturated fat, along with decreased physical activity, may also have consequences for incidence rates in colorectal cancer or other cancers.[32–34]

Immigrants' mortality patterns are influenced both by their native country and adopted nation, where the social environment may contribute to host resistance. Assessment of determinants of dietary and other health behaviors in cultural and religious groups can thus provide clues to the interactive consequences of social, environmental, and biological influences on disease prevalence and outcome. The study of waves of migration in populations has underscored the impact of secular change on the risk of developing certain chronic illnesses.[35] Among Japanese living in Hawaii, their initially low colorectal cancer risk has increased in conjunction with the population's dietary transition from a typical Japanese diet to a more western one.[35] A recent report on the effect of migration on blood pressure among the Yi people, an ethnic group in China, examined differences in lifestyle attributable to migration.[36] The authors found that migration had contributed to dietary changes among men, with a resultant weight gain and alteration of their dietary sodium/potassium ratio. These changes were associated with increased blood pressure among the migrant men. Such findings support the argument that environmental factors—often dietary in nature—are of major importance as causes of variation in disease rates.[26]

Dietary and nutritional factors underlie many conditions that contribute to other health disparities between societies. While the ability to clarify these findings is still limited, because relatively few nutritional epidemiologic studies have compared distinct groups on similar attributes,[37] such studies would increase our understanding of the importance and interaction of factors leading to heightened disease risk.[26] Moreover, to assure successful health education programs, it is important to have identified local cultural practices and beliefs.[38] In Hawaii, researchers have begun to draw on the traditional, culturally-accepted diet to redress the impact of westerners on native Hawaiian society.[39] These authors stress the potential of intervention programs that draw on traditional diet as a means for preventing diseases such as cancer. Others see this application as a means of limiting obesity and other chronic diseases.[40] A similar culturally-based approach has been explored to encourage Pima Indians in the southwestern United States to return to their traditional diet to help decrease the dramatically high incidence of noninsulin dependent diabetes.[41]

Assessing dietary intake in heterogeneous populations in national surveys poses many methodologic, statistical, and interpretive issues.[37,42] Nonetheless, health professionals in any multicultural society must be aware of population demographics, cultural influences on food consumption patterns, and health care usage by ethnic groups, a subject of escalating importance in the western world.[43]

ANTHROPOLOGICAL BACKGROUND

A clarification of common, but sometimes confusing, concepts in social anthropology should emphasize the importance of cultural orientation and adherence to belief systems, and their collective influence on attitudes and behavior that may ultimately affect health interventions. A 'world view' (socially-shared values and concepts about the universe, and people's place in it) is defined as the first universal component of ideology. As its public manifestation, *culture* encompasses a complex and dynamic set of social norms, values, beliefs, cosmology, knowledge, and experience that describe the workings of the world to the culture.[44] As the expression of public, standardized values of a community, culture mediates the experience of individuals, and it provides basic categories for the creation of a positive pattern in which ideas and values are tidily ordered. An *ethnic group,* on the other hand, implies a hereditary component. It has a common culture that is also firmly rooted in a communal familial, economic, and social structure; and it generally originates in a particular geographic area. Cultural authority, often mediated through peer pressure, induces assent via the assent of others. While individuals who identify with a common set of cultural attributes may be of different ethnic or religious origins, a common ethnic background (which generally implies a common religious affiliation) further underscores the impact of cultural authority on its adherents.

Religion has been considered as the second universal component of ideology.[45] It has traditionally been firmly rooted in the ethical values of community life, functioning on personal and social levels to provide a stable niche in a predictable environment;[46] this ultimately provides its adherents with an understanding of the world and the relationships that exist between individuals.[45] Individuals may choose to practice their faith communally or in solitude, and their form of worship may vary according to personal spiritual needs or by occasion. Thus, religion should be viewed not only as a haphazard relation of a single individual to a supernatural power, but also as a manifestation of the relationship of the whole community—as a collective entity of individuals—to a power that has the good of the community at heart. Although it might appear that active religious practice has declined in recent years, religions still provide networks of social and emotional support to many millions, often comprising behavior-monitoring structures that advise and influence adherents on activities considered acceptable to the group.[47] Furthermore, the major world religions have experienced a resurgence in fundamentalist practice that has had far-reaching effects in some sectors of western society.

CULTURE AND DIET

Since foods have symbolic potential as ethnic identifiers, dietary patterns of members of a related group tend to be conservative; the specific identifying foods are likely to remain as the

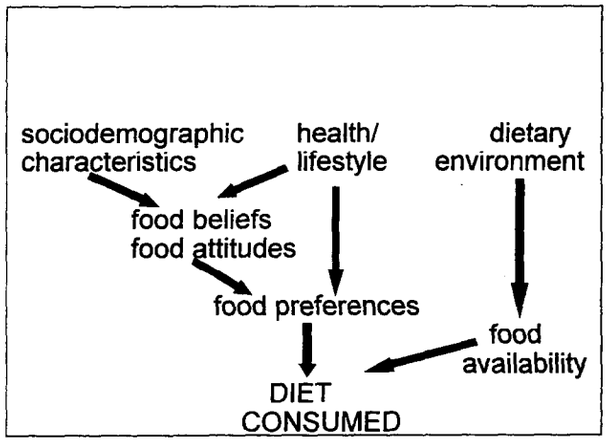

FIG. 1. Determinants of food intake.

last vestige of a cultural identity.[48] When ethnic groups are relatively closed to out-migration or intermarriage with nonmembers, the transmission and reinforcement of the food system continue via social interactions.[49] Diet can thus be construed as a cultural construct influenced by multiple factors that operate alone or together,[50,51] reflecting progressive lifelong development according to acquired experience. Specific food habits result from the combined sources of influence exerted by attitudes, beliefs, and experience on the food practices of a group or community, as well as economic factors in conjunction with local market resources. Historically, each culture has had its particular "superfoods." Within a given cultural context, they fostered a common identity via their prestige value, magical properties, and relationship to body image, sometimes performing a special role, particularly in stages of the lifecycle.[52] There is evidence to show that cultural identity and food habits have long supported and reinforced one another.[44] In most societies, *foodways* (traditional foods and ways of eating) are passed on through the children of a society, so that each subsequent generation knows what is properly considered as "food."[53]

Therefore, determinants of dietary action may be found on an individual and collective scale. These influences can entail (*1*) personal status and economic resources; (*2*) social, professional, or familial milieu; and (*3*) ethnic origin, age, and sex of the individual. These work synergistically to affect a range of behaviors and lifestyle factors that may ultimately determine health practices and disease outcome.[54] Even in modern society, the foods people prefer and select from their environment are dependent on factors that interact in a complex and dynamic cultural, social, and economic milieu.[55–57] Such foods often reinforce both ethnic identity and religious beliefs,[44] and they reflect their acceptability and availability to the consumer.[1] In summary, psychosocial, cultural, and situational factors interact to determine food purchasing habits, as well as methods of preparation and consumption of these foods. These factors may lead to marked geographic, cultural, and ethnic differences, even when the food distribution network is well-developed and the same foods are available country-wide. Figure 1 depicts these determinants of dietary behaviour.

RELIGION, HEALTH, AND DIET

It has been observed that cultural-religious beliefs and practices can have a significant impact on health risks. The following section thus draws on religion as the cultural focal point, because religions often have health and dietary "rules" that are clearly-defined to adherents in written (usually holy) texts. Unfortunately, little data exist on the prevalence of observance of dietary rules within religious groups. Numerous studies have described differential overall mortality, and age- and sex-specific mortality, in religious or ethnic groupings. Morbidity and mortality outcome have been related to country of birth and ethnicity,[58,59] religious affiliation and migrant status,[60] or socioeconomic status;[61] different morbidity rates have been observed for cardiovascular diseases, hypertension and stroke, some cancers, inflammatory bowel diseases, and general health status in religious groups. Significant associations have also been found for morbidity and mortality by subjective religiosity and religious attendance.[62] Major religious denomination (Catholic, Jewish, Protestant) has been linked with longevity,[63] mortality due to all causes, all neoplasms and specific cancer sites,[58,61,64–71] as well as diabetes, respiratory diseases, and circulatory diseases.[71,72]

Research on religion and well-being indicates that *religiosity*—the degree of adherence to a set of religious beliefs—may reduce stress, symptom prevalence, prolong survival, and contribute to, or even produce, a healthier lifestyle.[73–76] Its absence may aggravate poor health in the elderly, while death may be postponed until after occasions of major importance to religious ill persons.[77,78] Religiosity was found to be important for the maintenance of morale and coping attitudes among both healthy and sick aging individuals.[79] Furthermore, Hannay[74] determined that active religious allegiance was associated with significantly fewer symptoms (particularly mental, but also social and physical) in a mixed, mostly Christian community in Glasgow.

It must be remembered that religions evolved within existing cultures, whereby established environmental and magical food habits were simply incorporated into emerging faiths. While all religions serve many of the same functions, striving to make sense of the inexplicable and to decrease anxieties associated with the unknown,[13] religious adherence can enhance a feeling of unity and social solidarity within a group, where practicing members participate in common activities in an atmosphere often charged with emotion.[45] However, to unite a people, they must at times be defined, even to themselves.[80] Food prescriptions or avoidances as practiced by a (religious) group foster a sense of security within that community. For example, in praying for good weather and an abundant harvest, North American Christian fundamentalist farmers, such as the Amish, attempt to "enlist the cooperation" of the supernatural forces and ensure a successful outcome of planting.[45]

Food taboos, common to all religions, illustrate the concept of *pollution* and reflect moral issues.[81] The "taboo" (from a Polynesian language, meaning "restraint imposed by social usage or as a protective measure") was originally intended as a sacred prohibition enacted upon certain objects (in this case, foods), which rendered them untouchable, outcast by the culture. We now interpret food taboos as prohibitions on foods that are forbidden because of tradition or convention.[82–83] Food taboos may have an adaptive value; production of milk or eggs has the potential to feed far more people than the flesh of one individual cow or hen.[83] In the Hindu doctrine, the religious reason for holding cattle sacred derives from the belief that the cow was created by *Brahma* on the same day as the *Brahmin*.[53] However, the practical value of using cattle to provide manure for fertilizer or work pulling plows, and considering milk and ghee (clarified butter) to be holy, as products of a sacred creature, may have economic and nutritional value for the community.

Overall, food restrictions result from numerous influences, such as magical and religious beliefs, fear of contamination, health concepts, and social structure.[82] In some cases, these influences have become intertwined with highly varied, culture-specific food superstitions. Food taboos may have originated in cultural unfa-

miliarity with a food, or its opposite—the rejection of possible foods that stem from creatures too familiar to a group (not eating certain domesticated animals, for example). It is noteworthy that many of the foods prohibited by religions on a temporary or permanent basis, are of animal origin. Devout Hindus and Buddhists eat no meat at all; Judaism and Islam forbid the consumption of pork; Orthodox Christianity restricts meat intake on fasting days, and the Catholic church used to prohibit meat on Fridays.[13]

Most religions advocate religious fasting, perceived as a votive, penitential act that is practiced in order to gain spiritual merit.[84] Fasting is usually associated with particular religious observances: as a way to increase introspection, remember a mournful event in the history of the religion, pay homage to the hungry, and bring the individual to a plane closer to God. Most instances of religious fasting are brief and, depending on the religion and occasion, may take one of two forms: (*1*) total abstinence from food and drink, or (*2*) abstaining from certain dietary items (usually of animal origin). Fasts represent a departure from secular time, when people merge with the myths and sacred history; fasting can also be seen as an expression of religious piety, shared identity, and the community bond of a shared past and present.[14] Health consequences of intermittent, short-term religious fasting are unknown. However, fasting is medically contraindicated in pregnant women, those with renal problems, or those with a psychosis in remission; insufficient fluid intake will lead to electrolyte imbalance, and prolonged fasting causes reduction in circulating blood glucose concentrations, stimulating lipolysis, with the release of free fatty acids and ketogenesis.[86,87]

As a means of reinforcing ethnic identity and religious beliefs, food traditions are conducive to psychological well-being.[44] Because religion strives to make sense of the inexplicable, it is not surprising that guidelines, rules, standards of behavior, and activities exist within religions to ward off sickness and death.[45] Historically, religious restrictions on particular foods were meant to prevent moral, psychological, and physical harm;[56] the observance of religious dietary regulations, preserved in texts holy to their respective groups, has been encouraged since early times. Such behaviors and attitudes may have either beneficial or harmful effects.[76] However, cultural mores are transmitted from one generation to another; and, as a learned phenomenon, tradition may be differentially applied by individuals within the cultural subgroup.[88] For example, some of the observances and taboos of the Jewish dietary laws (*kashruth*) are very deeply rooted in the historical background of Judaism, whereas others arose in the diverse environments where Jewish communities had become established and whence their varied culinary habits evolved.[83,89,90]

DIET, LIFESTYLE, AND HEALTH OUTCOME AMONG SELECTED RELIGIOUS GROUPS

Particular groups with clearly defined, unusual, or unique, practices (often related to religious aspects of their cultural precepts) have been studied in order to better understand the nature of such habits in relation to health outcome. A sampling of studies published in the last 20 years exploring associations between religion, diet, and health may be found in Table I.

Among Seventh-Day Adventists,[91] Mormons,[73] or Jews,[71,89–94] some dietary and other lifestyle attributes related to religious beliefs, ethnicity, and birthplace (Kark JD, personal communication, 1994) appear to be expressed in differential—generally advantageous—incidence and mortality rates for a range of diseases.

Other population groups follow religious dietary rules dominated by humoral concepts, such that particular foods are ordained or proscribed at critical periods in the life cycle.[38,95–100] Though these humoral concepts clearly have philosophical and social value, they may place young children, pubescent girls, and pregnant and lactating women at nutritional risk during physiologically critical times.

Both Islam and the Baha'i faith have religious dietary rules; those of the former group resemble some aspects of the Jewish dietary laws; the latter group's dietary recommendations, while not obligatory to followers, resemble both the healthy eating principles of Mormons and the reverence for life of the Buddhists. However, we are unaware of published dietary studies among these groups.

On the other hand, the Buddhist doctrine stipulates that it is forbidden to kill living beings. Ogata et al.[101] have observed lower mortality from all causes in Zen Buddhist priests consuming traditional Japanese diets with little Western influence (fewer than 10% ate meat and fish on a daily basis), and having low rates of smoking but similar alcohol intakes, compared to other Japanese men. In a study of diet and hemostatic factors associated with high risk of coronary heart disease, Pan et al.[102] found that young Buddhist vegetarians had significantly lower concentrations of plasma cholesterol, glucose, and uric acid; and they consumed 7% less fat, 10% more carbohydrate, and 3% less protein, compared to omnivores. The polyunsaturated to saturated fat (P:S) ratios of these vegetarians were more than three times higher than those of the omnivorous group.

Perhaps the most widely-studied of modern religious groups, Seventh-Day Adventists are noted for their health-promoting lifestyle. Phillips et al.[103] have examined the contribution of *selection* versus *lifestyle* on the risk of cancer and cardiovascular disease among American Seventh-Day Adventists. Though they were unable to clearly distinguish between these two hypotheses, it would appear that the Adventists' lifestyle afforded them the greater measure of protection from cancer and cardiovascular-disease mortality. In fact, these authors suggested that protective influences act even among converts who vigorously adopt Church principles; consequently, in spite of their often lower socioeconomic status at conversion into the faith, they enjoy the protection afforded by adherence to the healthy living principles recommended by the Church. These principles espouse lacto-ovo vegetarianism, with little consumption of animal food, high intakes of vegetables and fruits, little caffeine, no alcohol, and no tobacco use. The impact of these recommendations has been carefully studied among Adventists in California in relation to their degree of adherence to these religious dietary recommendations. Findings indicate that intakes of meat and eggs are related to increased mortality from coronary heart disease, diabetes, and some neoplasms; while consumption of leafy green vegetables has had the opposite impact in this population.[91,104] In another large cohort of American Adventists followed since 1974 for determinants of coronary heart disease, frequent consumption of nuts and whole wheat bread has been observed to be protective.[105] While it was suggested that the unique fatty acid composition of the nuts and the high fiber content of both food groups might be chiefly responsible for this effect, it has also been speculated that these foods could merely be markers of other causal factors, although no evidence of confounding was identified. Danish and Japanese Adventists have demonstrated lower risks for tobacco and alcohol-related cancers as well, not only due to their lesser use of these substances but also because of their low-meat, low-fat, and high-fiber dietary habits.[100,106] In other Adventist populations, low frequencies of consumption of broiled meat or fish (consequently contributing little benzo[α]pyrene and nitrosomines to the diet) are likely to be responsible for their low risk for cancers of the digestive tract.[107,108] In addition, their greater intakes of foods furnishing vitamins A and C may also protect against many of the major sites of cancer.[107]

Members of the Church of Jesus Christ of Latter-day Saints (Mormons) experience lower mortality from the "diseases of

TABLE I.

DIET, LIFESTYLE AND HEALTH OUTCOME IN SELECTED RELIGIOUS GROUPS

Reference	Population/religious group	Country	Dietary characteristics studied	Other variables examined	Outcome
Jarvis, 1977 [73]	Mormons	Canada	"Balanced diet": whole grains, plant protein, fruits and vegetables, little meat	Cohesive community lifestyle, church life	Low mortality from "diseases of affluence"
Phillips and Kuzma, 1977 [107]	Seventh-Day Adventists	Japan	Low intakes of broiled foods; antioxidant vitamins	Benzo[α]pyrenes, nitrosamines	Low cancers of digestive tract
Phillips et al., 1980 [103]	Seventh-Day Adventists	United States	Lacto-ovo vegetarianism; low animal food intake	Selection versus lifestyle	Low mortality; low CHD, cancer, diabetes
Jensen, 1983 [106]	Seventh-Day Adventists	Denmark	Lacto-ovo vegetarianism; fat, fiber	Smoking; alcohol intake	Low tobacco and alcohol-related cancers
Kahn et al., 1984 [104]	Seventh-Day Adventists	United States	Lacto-ovo vegetarianism; animal food intake	Health history; smoking; age at exposure to Adventist Church	Mortality higher with meat/egg intakes; lower with salad consumption
Ogata et al., 1984 [101]	Zen Buddhist priests	Japan	Traditional Japanese diet	Smoking, alcohol	Low all-cause mortality
Kuratsune et al., 1986 [108]	Seventh-Day Adventists	Japan	Lacto-ovo vegetarianism; broiled fish consumption	Mutagenic pyrolyzates in foods	Overall reduced mortality
Snowdon, 1988 [91]	Seventh-Day Adventists	United States	Lacto-ovo vegetarianism; low animal products intake	Mortality from major chronic diseases and all causes	Low meat and egg intake, higher milk; low all-cause mortality and chronic disease mortality
Fuchs et al., 1990 [109]	Old Order Amish	United States	Food and eating	Stress, obesity, physical activity, parity	Low hypertension, low stress, low circulatory disease mortality
Kapil et al., 1990 [38]	Jat Hindus	India	Humoral theory ("hot" vs. "cold"; "light vs. "heavy")	Maternal beliefs on diet and childhood illnesses	Identification of local cultural practices for nutrition education
Bitterman et al., 1991 [110]	Jews and non-Jews	Israel	Fluid intake, olives and olive oil, cumin, pepper	Exposure to sun, chemical products, smoking habits	Differences in urologic cancers related to different dietary patterns
Fraser et al., 1992 [105]	Seventh-Day Adventists	United States	Dietary determinants of CHD risk factors	Lifestyle habits related to CHD risk	Low risk of coronary heart disease in frequent consumers of nuts and whole wheat bread
Pan et al., 1993 [102]	Buddhists	Taiwan	Buddhist vegetarian diet	Plasma lipids, apolipoproteins, glucose, uric acid	Low plasma cholesterol, glucose, uric acid, apolipoproteinA-1:B
Shatenstein et al., 1993a, 1993b [89,90]	ultra-Orthodox Jews	Canada	Kosher diet	Jewish religious law; Jewish lifestyle	Low animal protein, low relative fat intake, high P:S ratio

CHD, coronary heart disease.

affluence" than the general population.[73] Adherents to this religious philosophy follow a lifestyle prescribed by their Church, in the belief that the human body is the temple of God and should be preserved in fit condition, by abstaining from caffeine, alcohol, and tobacco, while eating a balanced diet that emphasizes whole grains, plant proteins, fruits, and vegetables and discourages excess intake of meat. A cohesive community lifestyle is advocated, stressing strong family ties and social activities revolving around Church life.

Among the Old Order Amish in rural Ohio, Fuchs et al.[109] found differences in self-reports of behavioral risk factors as compared to non-Amish rural Ohio residents. Lower rates of hypertension, smoking, alcohol consumption, and stress were reported in this Amish community. Some of these factors could contribute to their lower mortality due to circulatory and cardiovascular diseases. Although obesity was more prevalent (probably related to the great importance attached by the Amish to food and eating, and possibly associated with high parity in the women, and

decreased physical activity among middle-aged and older men, whose sons did much of the farm work), it appeared to be more tolerated or less stigmatized in Amish culture.

In the Acre district in Israel, a high incidence of urinary tract cancers has been observed among Jews compared to non-Jews: Bitterman et al.[110] have attributed this to lower intakes of fluids, olives and olive oil, and the spices cumin and pepper by the Jewish group. And, while ultra-Orthodox Jews in Montreal are more likely to be culturally homogeneous than the various Seventh-Day Adventist groups studied worldwide, an interesting parallel may be drawn between Adventist converts who enthusiastically adopt Church doctrine, and those non-traditional or secular Jews who embrace fundamentalist Judaism; many of the latter wholeheartedly adopt dietary and lifestyle practices (eating a kosher, sometimes vegetarian, diet, or giving up smoking) upon becoming religious, which may decrease their former levels of risk for some chronic diseases. Most noteworthy is their low mean relative fat intake (30% of energy) and high P:S ratio (0.9).[89,90] It has been observed that Montreal Jews overall have low all-cause mortality, principally due to their strikingly low rates of death due to circulatory system diseases.[71] The Jewish motivation in health-related issues has a religious origin, where the Bible refers to disease as a "manifestation of the anger of God," who will heal if his commandments are heeded. Jewish religious law (*halachah*) ordains that anything potentially injurious to well-being must be avoided, and lifestyle must be conducive to good health. Decades ago, it was postulated that low Jewish mortality rates might result from adherence to "a traditional way of life, customs and rules of living."[111]

Findings such as these have contributed to the highly controversial literature on associations between diet and the major chronic diseases of developed nations.[99] However, recent dietary data and their determinants are largely unavailable for many minority ethnic groups in North America and Europe or elsewhere, hampering our ability to estimate relative risks of diet and disease.[37] Cultural, ethnic, and religious dietary habits are in constant evolution from their place of origin, incorporating environmental adaptation and changes in societal mores, while forming an integral part of the individual's self-perception. The primary importance of family, community maintenance, and solidarity among certain religious groups, along with their philosophy and tradition, may well exert a salutary role. Surveys of cultural or religious practices as determinants of health behaviors and outcome appear to have strengthened this view, and certain types of community affiliation and cohesiveness seem to mediate life stressors.[112,113] For example, a recent study of mortality differences in two Jewish populations appears to indicate that community cohesiveness, socioeconomic status, and ethnic origin (possibly reflecting genetic differences as well) may play a major role in determining mortality patterns.[71]

IMPLICATIONS FOR RESEARCHERS AND CLINICIANS

Some investigators have undertaken specific evaluations of dietary attributes and other health behaviours according to established cultural practices, including religion and degree of religiosity.[73,76,91–93,114,115] However, comparative studies must be pursued in the changing multicultural environments of North America, Europe, and elsewhere. This will provide valuable empirical information to add to our understanding of the interwoven influences of cultural attributes on health-related behaviors, and it will raise the potential for improving health through culture-based effective nutrition interventions.[39,40,116]

While the suggestion of a differential impact on health related to active versus passive religious allegiance might provide some insight into this issue,[74] others have indicated that the absence of a clearly defined notion of the perceived meanings of religion or religiosity, and inconsistencies in the way in which these variables are handled, have blocked progress.[115] The challenge lies in distinguishing between membership and participation, defining extent of observance or compliance, and separating the effects of religious injunctions from other variables (socioeconomic status, social support, ethnicity, dietary regimens, lifestyle, and others) that confound the issue.[76,117]

Adherence to particular beliefs within a cultural context may be indicative of favorable or harmful health attributes. Health professionals must seek to understand the contribution of these various religious or culturally-mediated behaviors and work to clarify their potential nutritional and overall health benefits. Dietary assessment should, therefore, integrate markers of the cultural determinants of food consumption and other behaviors into routine nutritional evaluation and health-assessment strategies. This approach will aid in evaluating dietary adequacy and related health practices within the context of the consumer's sociocultural value system. It should result in improved counselling practices, in order to meet the ultimate goal of diminishing risk for chronic diseases.

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(For an additional perspective see editorial comments on page 238.)