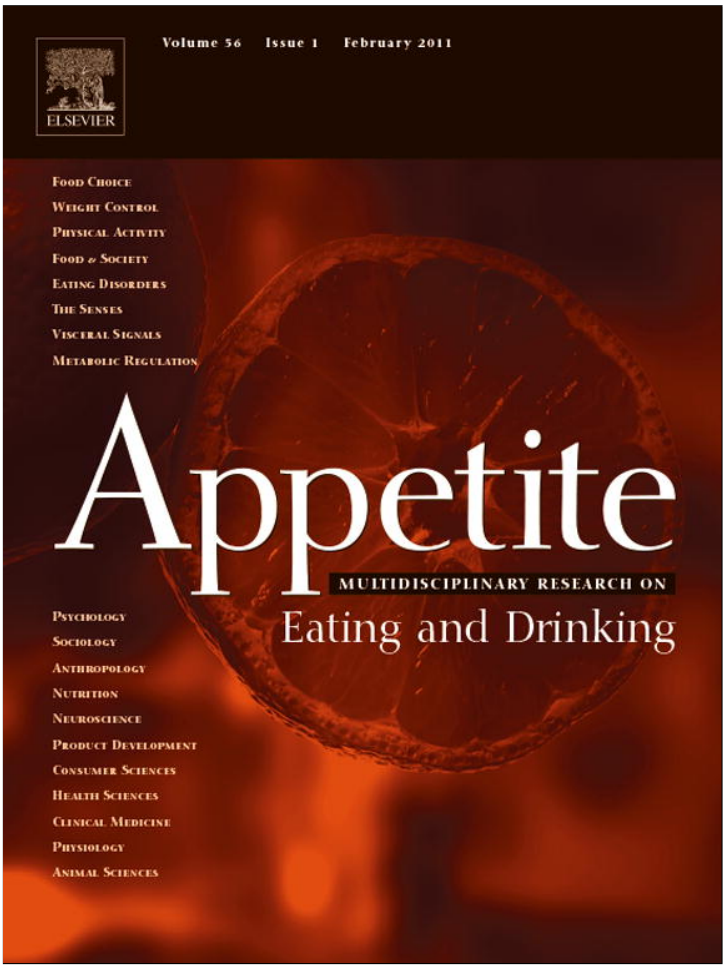

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Research report

Medical doctors' attitudes and beliefs about diet and health are more like those of their lay countrymen (France, Germany, Italy, UK and USA) than those of doctors in other countries☆

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ABSTRACT

The relation between diet and health has become a public health concern in Western/developed countries. Physicians are influenced in their views about health by their medical training and membership in a particular culture/nation to one extent or another. Their medical training is itself influenced by both a common body of accepted formal knowledge and practice and culture- or nation-specific influences on medical education. In this study, we compared physicians from different countries and physicians and lay individuals from the same country with regard to beliefs and attitudes about the relation between diet and health and other health-related issues. Telephone interviews about diet and health conducted with randomly sampled physicians and laypersons in France, Germany, Italy, the United Kingdom, and the USA revealed substantial cultural/national differences and few differences between physicians and laypersons of the same country. Three different measures of similarity converged in supporting the claim that in the areas of diet and health, physicians resemble their countrymen more than they resemble physicians from other Western countries. The degree to which differences in culture- and nation-mediated medical education influence these results is to be determined.

Introduction

In recent times, in Western/developed countries, food has become less expensive, more abundant, varied, available, palatable and caloric. One consequence of these changes is an increase in obesity (e.g., Charles, Eschwège, & Basdevant, 2008; Ogden et al., 2006), which is an important public health concern. Knowledge about food and diet held by lay members of any country or culture is transmitted by physicians, medical information in the media, cultural or national culinary traditions and health attitudes. Influences on lay beliefs regarding the relation between diet and health are now an issue of concern in psychology as well.

Efforts to improve eating and other health habits are based on the implicit assumption that providing scientific, medical, "rational" information to the public will help people make healthier choices. General practitioners and the medical profession would seem to be well-positioned to convey nutrition-related information to patients, given their professional standing and role to provide medical and health advice. There is some question about the quality of empirically based nutrition information available to medical professionals, though. Indeed, the history of advice concerning food choice in the United States during the 20th century consisted largely of diet "fads" that typically last the order of a decade, were supported by selected empirical evidence and were promoted by physician "entrepreneurs" (Levenstein, in press). Despite this degree of confusion, some nutrition-related practices are well supported empirically. Examples include the cardiovascular benefits of limiting intake of trans-fatty acids (Mozaffarian & Clarke, 2009) and the utility of whole grains and dietary fiber consumption in limiting risk of diabetes (American Diabetes Association, 2006). This type of information could be incorporated readily into medical education. The amount of attention paid in medical education to nutrition and the relation between diet and long-term effects on health has been found to be lacking though (e.g., in the United States [Adams, Lindell, Kohlmeier, & Zeisel, 2006]). This is despite evidence that improper nutrition (both under- and over-eating) is a risk factor for several

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degenerative diseases (Jaron & Galal, 2009). Thus, medical education has not caught up fully to the myriad health problems associated with unhealthy eating. The aforementioned limitations and inconsistencies in empirical evidence about nutrition and the lack of attention in medical education to topics for which empirical evidence is relatively strong may allow medical professionals' advice to be influenced largely by cultural/national beliefs. It is also possible that culturally based beliefs are so strong that the education medical professionals receive is filtered through the long-standing influences of their culture/nation.

"Traditional" medical beliefs and practices were often the focus of anthropologists' attention and have been contrasted with "scientific medicine" (Good, 1994; Horton, 1997). Only a few studies have dealt in a systematic way with variability within and among Western cultures/nations and within the medical profession itself (DeVries & Lemmens, 2006; Helman 1984/2001; Pouchelle, 1999). In her book *Medicine and Culture*, based on a consideration of medical practice in the United States and three European countries, journalist Lynn Payer (1996) reported large cultural/national differences in health practices and related attitudes: "the differences are so great that one country's treatment of choice may be considered malpractice across the border" (p. 24). Payer supports her ideas with relevant evidence, but there is no direct and explicit assessment of her claim that given their shared cultural/national background, physicians and lay people from the same country will bear a stronger resemblance in attitudes and beliefs than physicians from different countries. Of course, this claim presumes that there *are* substantial cultural/national differences.

Payer presents substantial evidence for differences in medical practice among four Western countries (France, Germany, United Kingdom, United States). For example, Payer (1996) identified American culture as being oriented toward aggressive medical intervention. Accordingly, in the USA, rates of several types of surgical procedures are far above average, compared to other countries in the Organization for Economic Cooperation and Development (OECD) (Pearson, 2009). There is also some evidence for lay differences in these same countries in beliefs concerning the link between diet and long-term health. The focus of attention has been France versus the United States. Historical analyses (Stearns, 1997), questionnaire studies of contemporary French and Americans (Fischler & Masson, 2008; Rozin, 2005; Rozin, Fischler, Imada, Sarubin, & Wrzesniewski, 1999; Rozin, Fischler, Shields, & Masson, 2006), and analyses of the food environment (Rozin, Kabnick, Pete, Fischler, & Shields, 2003) all suggest distinct French-American differences. Overall, in terms of representations, French focus more on food, including its freshness, quality, and taste; think of food more as an experience and less as a health risk; view healthiness as a natural feature of good food; embody more collective food values; associate food with conviviality; eat smaller portions; eat less food modified to be "healthier;" snack less and tend to eat meals at more regular hours (de Saint Pol, 2006; Lerner, 1956). More generally, French are governed more in their eating and food decisions by optimizing pleasure, following tradition, being moderate, valuing quality over quantity, and joys over comforts (Rozin, Remick, & Fischler, submitted for publication). Cross-cultural/national differences in attitudes regarding the relationship between diet and health are of particular relevance to the present study.

The present study sets out to document differences between countries in attitudes and beliefs about the relation between diet and health, as well as other health-related issues, and then to assess the claim that in this area, at least, physician attitudes and beliefs are more similar to those of their lay countrymen than to physicians in other countries. We presented our respondents with questions pertaining to diet and health but not directly on "textbook," core medical issues in nutrition. This data collection was part of a general survey on attitudes toward diet and other aspects of health that included specific subsamples of randomly sampled physicians and lay persons in five countries: France, Germany, Italy, the United Kingdom, and the United States.

Methods

Participants

Stratified random samples were solicited for each of five countries: the United States, the United Kingdom, Germany, Italy and France. In each country, approximately 60 lay people and 50 physicians were recruited. Respondent selection and telephone interviews were carried out by a professional survey organization in France. The sample for each country (both lay and physician) was assembled by random selection from the phone book, weighting for regions and the population size of communities. Among those agreeing to an interview, quotas by sex, age and socioeconomic status were then applied to select the final respondents. Physicians in the sample were either general practitioners or pediatricians. The physician sample was drawn from the phone book and, in the US, from the American Medical Association directory. The cooperation rate (i.e., the percentage of telephone contacts that led to an interview [Keeter, Kennedy, Dimock, Best, & Craighill, 2006]) for the survey overall was 20.3%. Cooperation rates for lay people (29%) and physicians (9.7%) differed substantially. The interest in including a wide range of questions led to interviews being somewhat lengthy (about 45 min on average). Also, no compensation was provided to interview participants. These factors probably limited cooperation rates. The lack of compensation was cited frequently by physicians who refused to participate, particularly in the United States and the United Kingdom.

Procedures

A general description of the survey and a book summarizing many of the findings (but not those reported here) is available (Fischler & Masson, 2008). The interview questions were drafted on the basis of results from preliminary, exploratory focus groups conducted in all countries included in the survey and in the four languages represented. The file of telephone contacts amassed from the stratified, random sampling procedure was then connected to the electronic interview items in the Computer Assisted Telephone Interview (CATI) system. Numbers were called sequentially. Interviews were carried out in the native language of the respondent, by an interviewer very fluent in that language (in most cases a native speaker). After greeting potential participants and introducing themselves, interviewers requested participation by stating the following: "We are carrying out an international research project in conjunction with the University of Pennsylvania and the CNRS in Paris and would like to ask you a few questions about your views on the relationship between food and the body. Could you spare me a few minutes of your time?" CNRS is the French National Center for Scientific Research. The name of the participating institution from the respondent's home country was substituted for the University of Pennsylvania. Other participating institutions were Loughborough University (UK), the Social Science Research Center (Germany) and University of Bologna (Italy).

Measures

A subset of 34 items from the survey was selected for inclusion in the present report *before* examination of the results. Only items assessing health and diet-related attitudes potentially influenced

by physicians' specialized medical knowledge were selected. Complete text for all of these items is presented in the left hand column of Table 1. There were four types of items included in the set of 34.

1 Attitudes toward factors involved in the maintenance of good health (e.g., dieting, medicines), rated on a 0–10 scale.
2 Statements related to diet and health (e.g., "Most foods are either good or bad for health") to which participants were asked to agree or disagree on a four-point scale (disagree strongly to agree strongly, with no neutral point).
3 Ratings on a 0–10 scale of the healthiness of categories of food products such as meats and vegetables.
4 Attitudes related to the value of taking vitamin supplements. High scores were indicative of attitudes in support of the benefits of vitamin supplements.

Results

The sample ($N = 558$) was slightly skewed toward females (54%) due to slight over-sampling of females in Germany and Italy. The majority of physicians sampled were male (60%). The mean age for the entire sample was 49.9 ($SD = 12.7$). Males in the sample (mean age = 51.58, $SD = 13.3$) were slightly older than females ($M = 48.6$, $SD = 12.0$). Lay people and physicians did not differ significantly by age.

Partial data reduction for the items included in the survey was possible, as a result of principal component analysis, with varimax rotation. Strong internal consistency reliability was found for five items on the use and value of vitamin supplements (Cronbach *alpha* = .73), which were averaged to form a single score. The five items are listed in Table 1. Ratings of the healthiness of six dairy items also emerged as a factor, and were averaged (Cronbach

Table 1
Summary of findings concerning 25 items pertaining to attitudes toward food and health.

Item	*F* value for CULTURE/NATION ($df = 4$)	*F* value for LAY/DOCTOR STATUS ($df = 1$)	*F* value for interactions ($df = 4$)	Comments[f]
Attitudes about and personal use of vitamins				
1. Five combined items on vitamins and their importance (*z*-score)[a]	13.779**	34.491**	1.524	USA highest; doctors lower
2. Do you, personally, take vitamins or other such products?[b]	18.834**	1.443	2.613	USA highest; true in both doctors and lay
3. Vitamins are products that should not be taken in excess[c]	12.772**	2.937	1.392	UK lowest
Healthiness of different foods (0–10 scale)				
4. Fruits	2.119	2.539	1.550	
5. Vegetables	3.729*	.010	.371	No large effect; USA highest, France lowest
6. Fish	.580	.089	.754	
7. Meats	3.255	.130	3.389*	French lay think meat healthier than French docs
8. Cereal like wheat, corn, barley	8.152**	2.440	.929	French lowest
9. Wine	3.949*	3.845	1.189	USA lowest
10. Dairy (6 combined examples)[d]	21.209**	2.858	.732	UK, USA lowest
Importance of practices for maintaining good health[e]				
11. Food	8.997**	.209	.529	USA, UK highest
12. Exercise	5.195**	.408	2.004	France lowest
13. Medicines	5.275**	.000	3.275	USA highest, Germany lowest
14. Dieting	18.743**	10.433**	2.593	Italy highest; doctors higher
15. Fasting	12.315**	1.805	1.013	Germany highest
Food-health beliefs and practices[c]				
16. Keeping regular meal times is essential	24.749**	4.001	1.316	France highest, UK, USA lowest
17. Good tasting food is good for you	38.172**	.904	3.669*	France lowest, Germany highest; Italian doctors lower than lay
18. Ultimately, I alone am responsible for my food choices, so it is important that I make the right choices.	3.385*	1.579	2.740	Largest difference between Germany and Italy (Germany higher)
19. When choosing my foods, I listen to my body, it knows what I need	4.414*	37.806**	2.038	Lay higher
20. It is important to keep informed regarding new findings in medicine and nutrition	10.307**	2.388	1.832	UK lowest
21. Moderation in eating pretty much ensures a healthy diet	16.888**	5.464	.667	France lowest
22. Diversity in eating pretty much ensures a healthy diet	21.749**	.800	1.418	USA, UK lowest
23. Most foods are either good or bad for health	24.527**	1.340	2.077	Italy highest
24. Foods and medicines are fundamentally different	38.029**	.793	1.588	USA, UK lowest
25. The tastes of food affects how you feel	13.500**	.340	.092	Germany, Italy highest

[a] Five vitamin items: "Vitamins help the body build up its defenses so that we don't have to take medicines;" "Vitamins supply nutrients that are no longer in our foods because of processing or poor quality;" "Vitamins supply nutrients that we are not getting because of our poor eating habits;" "Vitamins supply nutrients that we need in addition to a balanced diet" (these 4 items rated on response scale indicated under footnote b) and importance of vitamin supplements for maintaining good health (rated on scale indicated under footnote e) (Cronbach's *alpha* = .73).
[b] Responses rated as: 1 daily, 2 once in a while, seasonally – for example, to prevent colds, 3 never.
[c] Response choice: 1 strongly agree, 2 agree, 3 disagree, 4 strongly disagree.
[d] Dairy products rated on 0–10 healthiness scale: dairy products, milk straight from the cow, yogurt because it has active cultures, cheese made from unpasteurized milk, pasteurized cheese, organic milk (Cronbach *alpha* = .76).
[e] Rated on a scale of 0–10 in relation to importance for maintaining good health.
[f] Differences noted were significant at $p < .01$ by Scheffé tests. No other comparisons were significant at this level.
* $p < .01$, two tailed.
** $p < .001$, two tailed.

alpha = .76; listed in Table 1). The remaining 23 items from the set of 34 selected items were treated individually, resulting in scores for 25 variables. All variables were converted to 0–10 scales. We adopted a criterion for significance of $p < .01$, two tailed.

We examined the case for both cultural/national differences and greater resemblance of doctors to their countrymen than to other-country doctors using three different types of analyses. We first examined the scores by culture/nation and status for each of the 25 items. Results of 2-way *ANOVA*s (*F*s for country effect, medical status effect, and interaction) are in Table 1. There was a significant country effect ($p < .01$ or better) for 22 out of the 25 questions, and a significant medical status effect on only 3 of 25 items. A chi square analysis indicated a highly significant difference between the number of significant effects for country and for medical status, X^2 (1, $N = 25$) = 28.88, $p < .001$. There were only two significant interactions. Fig. 1 presents illustrative results by country and status for agreement with the statement "Diversity in eating pretty much ensures a healthy diet."

The only significant effects at $p < .01$ for medical status concerned the importance of vitamins (lower for doctors), importance of dieting for health (higher for doctors) and listening to one's body as a guide to food choice (lower for doctors). These three items also showed significant culture/nation effects (Table 1). The only three items for which there was not a significant difference by country at $p < .01$ were healthiness of fruit, fish, and meat.

Our second measure was the pattern of responses across all 25 items. The results of the study can be summarized in terms of mean scores on each of 25 items for five countries by medical versus lay status. Thus, there were ten columns of data (5×2), each containing the mean scores for each of the 25 items. We calculated Pearson correlations across the paired scores for the 25 items for each possible pairing of groups. All of these correlations were positive and high, because there was general agreement about many of the items (for example, the healthiness of vegetables). The five correlations between doctors and lay persons of the same country averaged .92 (range: .87–.95). The ten correlations of doctors in each country with doctors in each other country averaged .79 (range: .72–.91), and the corresponding ten correlations of lay persons averaged .78 (range: .67–.88). There was almost no overlap in the range of correlations observed between doctors and lay from the same country and the ranges of correlations observed in the other two groupings (i.e., doctor–doctor and lay–lay) (Fig. 2). A one-way *ANOVA* showed a significant effect of grouping, $F(2,22) = 8.895$, $p = .001$; squared multiple $r = .45$. Post hoc Scheffé tests indicated that the doctor–lay (same country) set of correlations was significantly higher than either of the lay–lay or doctor–doctor sets ($p < .01$).

A high correlation could result from a similar pattern between two groups, but a marked across-the-board difference in absolute level of endorsement of the set of items. To control for this possibility, for our third analysis, we computed the absolute difference between the 25 pairs of scores for each pairing of groups, and calculated the mean of these 25 differences for each pair of groups. Higher values here, unlike the case for correlations, indicate lower resemblance. The five mean differences between doctors and lay persons of the same country averaged .58 (range: .45–.74). The ten mean differences of doctors in each country with doctors in each other country averaged 1.00 (range: .71–1.19), and the corresponding ten differences of lay persons averaged .93 (range: .58–1.12). Similar to the prior analysis, there was little overlap in the range of differences observed between doctors and lay from the same country and the ranges of differences observed in the other two groupings (i.e., doctor–doctor and lay–lay) (Fig. 3). A one-way *ANOVA* showed a significant effect of grouping, $F(2,22) = 13.043$, $p < .001$, squared multiple $r = .54$, with the doctor–lay-same-country group significantly lower than the doctor–doctor group ($p < .001$, Scheffé test) and the lay–lay group ($p < .01$, Scheffé test).

There was a common cultural/national pattern in which the United Kingdom and United States were similar to one another and different from France, Germany and Italy. The highest score for lay–lay groups for pattern correlations was between USA and UK, and also the lowest absolute difference was between USA and UK laypersons. The segregation of USA and UK was also apparent in the

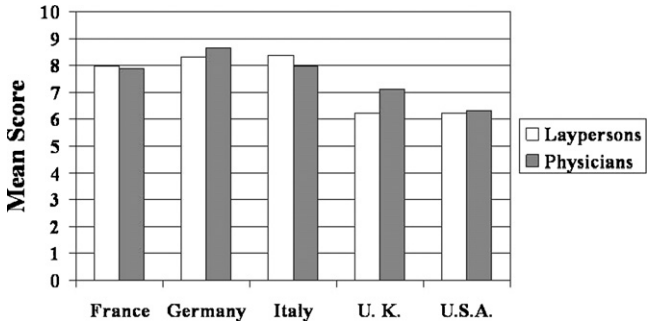

Fig. 1. Results by country and medical status for agreement with the item: "Diversity in eating pretty much ensures a healthy diet." The original 4-point agreement scale, like all other scales in this study, was converted to a 0–10 scale.

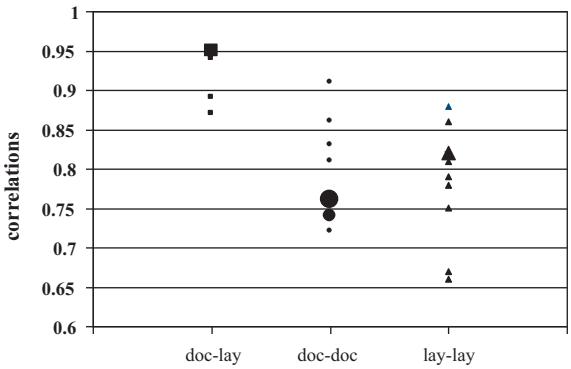

Fig. 2. Distribution of correlations across 25 items between pairs of groups. First column: doctors and laymen from same country; second column: doctors from different countries; third column: laypersons from different countries. A middle sized symbol indicates two scores at the same value, and a large symbol indicates three scores at the same value.

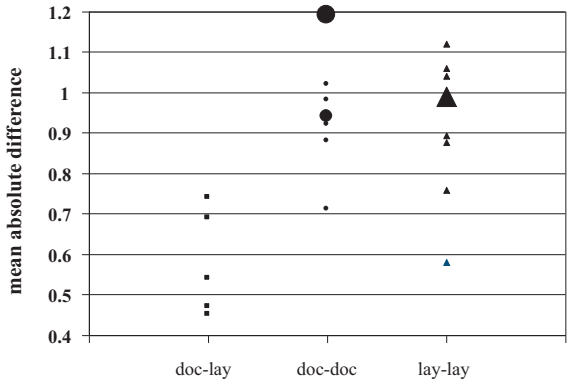

Fig. 3. Distribution of absolute mean differences across 25 items between pairs of groups. First column: doctors and laymen from same country, second column: doctors from different countries; third column: laypersons from different countries. A middle sized symbol indicates two scores at the same value, and a large symbol indicates three scores at the same value.

results plotted by country and medical status for many of the items.

Discussion

Results from this study indicated broad agreement on many matters related to diet and health across five countries and the doctor–lay comparison. However, when we focused on the differences, three different analyses yielded the same clear results: a high within-culture/nation doctor–lay resemblance, and a substantially lower resemblance between either lay individuals or doctors across cultures/nations. As Payer suggested, there were many country differences (22 out of 25 variables showed a significant country difference).

There was some evidence suggesting that France, Italy and to a lesser extent, Germany all hold an orientation toward food as an experience to be enjoyed rather than as a health behavior with the opposite orientation among the USA and UK. This divergence between France and the USA is in accordance with prior findings (Fischler & Masson, 2008; Rozin et al., 1999) and the division between the English and non-English speaking countries is clearly supported by other findings from the larger project this survey was a part of, including a second survey of 6000 individuals from six countries (Fischler & Masson, 2008; Rozin et al., 2006). Overall, our pattern of results here and in other reports from this survey and its successor (Fischler & Masson, 2008) support a more interventionist attitude among Americans, in accordance with Payer's (1996) observations. The USA stood out in the present study as most convinced of the health value of vitamin supplements and the importance of medicine for good health.

In the domain of diet and health, cultural/national effects may be particularly strong, because a great deal of attention is paid to food and its consequences in most cultures/nations. Also, while there is strong empirical evidence to support some recommendations regarding diet and health (American Diabetes Association, 2006; Mozaffarian & Clarke, 2009), the veracity of other recommendations has been disputed medically (Levenstein, in press). This degree of ambiguity may allow cultural/national beliefs to have a particularly strong impact. Further, medical education, both in the United States (Adams et al., 2006) and in France (the two countries with which we are most familiar), has traditionally paid relatively little attention to the issue of diet and health, and the epidemiological fundamentals that form the basis for most evidence on diet and health. We suspect that the same is true to some extent in the other three countries. We attempted to allow medical training to assert itself in the findings by selecting beforehand 34 out of over 100 questions, which could have been influenced by the sophistication of one's medical knowledge. There is no widely used and accepted scale of beliefs on the relation between diet and health. As such, we created almost all the items we used, often taking them from our prior research. There was no systematic attempt to create a scale or to cover the full domain of diet-health beliefs.

It is possible that in other domains, including beliefs and attitudes about infectious diseases and the role of genetics in longevity, there would be weaker cultural/national effects. This is probably the case because of stronger medical consensus related to these topics. Accordingly, these topics are probably addressed more thoroughly in medical education, thus leaving less room for cultural/national effects to have an impact. Despite the lack of attention in medical education, improper diet is a risk factor for multiple degenerative diseases (Jaron & Galal, 2009). While the empirical evidence supporting principles of diet and health is probably not as strong as in some other areas of medicine, those practices that are well supported empirically should be given greater attention in medical education.

The present study had limitations. The cooperation rate for the survey was low, especially for the physician subsample. Response rates for telephone surveys have been declining over time, at least since the 1990s (Curtin, Presser, & Singer, 2005; Davern et al., 2010; Keeter et al., 2006; Steeh, Kirgis, Cannon, & DeWitt, 2001). Accordingly, the rate for the lay subsample was comparable to recent telephone surveys. Keeter et al. (2006) reported a cooperation rate of 34% in a national survey on political issues in the United States, in which they utilized telephone survey methods. Though not directly comparable to the present survey, response rates (i.e., the percentage of those sampled who completed an interview [Keeter et al., 2006]) with a maximum of five contact attempts per household in three recent, health-related surveys conducted in Minnesota and Oklahoma, USA (i.e., 26%, 30% and 37% [Davern et al., 2010]) are also indicative of reduced telephone interview completion rates during the past several years. Given widespread, reduced response rates, a number of investigators have addressed the question of whether lower response rates tend to be associated with biased responses. While response rate may affect the demographic breakdown of a sample, actual survey responses have been found not to be biased noticeably (Keeter et al., 2006). These findings suggest that the cooperation rate in the lay subsample in the present survey was comparable to other surveys conducted in the past several years and that response bias was probably avoided. At the same time, we acknowledge that the response rate in the physician subsample was lower than common rates in general population surveys. As a result, we cannot claim that the physician subsample in this survey was representative of physicians in the five countries involved. The length of the survey and lack of compensation probably precluded obtaining a representative sample of physicians. At the same time, we can think of no reason why the physician subsample in this survey would differ substantially from a randomly selected group of physicians in their diet and health-related attitudes. Despite the lack of representativeness for the physician subsample, we feel that this survey nonetheless represents a unique opportunity to address a number of interesting and important questions about attitudes toward diet and health, given its inclusion of participants from five countries and given the inclusion of both lay and physician respondents.

Another limitation concerns translation issues. While the telephone survey was translated into the common language in each country, and was carried out by highly fluent, typically native speakers, it is difficult to make allowance fully for differing connotations of terms. An additional limitation was that relatively few items were included to probe our prediction of greater interventionist tendencies among Americans.

Despite these limitations, findings from the present study speak convincingly to the substantial overlap between beliefs of physicians and their countrymen in the area of diet and its effects on health. Countries show substantial differences in these domains, and physicians' views were found to be similar to those of their countrymen. There are two possible accounts for the similarity of physician and lay beliefs. One is simply that both groups are heavily influenced directly by culture/nation-wide beliefs and attitudes in the areas of food, diet and health. The second is that these same culture/nation-wide beliefs and attitudes actually shape medical education in the countries in question, which in turn then influences physicians beliefs and attitudes and potentially, the advice they provide to patients. The present study provides no evidence as to the relative importance of these two pathways, though this would make a valuable topic for future research. Seemingly the best way to address this issue is to examine closely the content of medical education with regard to diet and health in multiple countries. If the information provided is as limited as has been reported previously and as we have

supposed, this would support the notion that cultural/national influences affect lay and physician attitudes directly. If, however, considerable attention is now paid to these topics in medical education and the information provided dovetails with commonly held cultural/national beliefs, this would support the interpretation that medical education acts as a mechanism underlying the strong relationships between lay and physician attitudes toward diet and health.

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