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Assessing the Cultural in Culturally Sensitive Printed Patient Education Materials for Chinese Americans with Type 2 Diabetes

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Abstract

Type 2 diabetes affects Chinese Americans at an alarming rate. To address this health disparity, research in the area of cultural sensitivity and health literacy provide useful guidelines for creating culturally appropriate health education. In this article, we use discourse analysis to examine a group of locally-available, Chinese and English language diabetes print documents from a surface and deep structure level of culture. First, we compared these documents to research findings about printed health information to determine if and how these documents apply current best practices for health literacy and culturally appropriate health communication. Second, we examined how diabetes as a disease and diabetes management is being constructed. The printed materials addressed surface level culture through the use of Chinese language, pictures, foods and exercises. From a deeper cultural level, the materials constructed diabetes management as a matter of measurement and control that contrasted with previous research suggesting an alternative construction of balance. A nuanced assessment of both surface and deeper levels of culture is essential for creating health education materials that are more culturally appropriate and can lead to increase health literacy and improved health outcomes.

Keywords

type 2 diabetes; Chinese Americans; culturally appropriate health education; printed health information; health communication; health literacy

Asian Americans are the fastest growing racial immigrant group in the United States and Chinese Americans (CAs) are the largest Asian ethnic group at 4 million people (U.S. Department of Commerce, 2013). After adjusting for body mass index (BMI), the odds of type 2 diabetes prevalence in Asian Americans are 60% higher than Whites (King et al., 2012). However, studies find heterogeneity among Asian Americans regarding diabetes

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prevalence with Native Hawaiians (King et al., 2012), South Asians and Filipinos having higher prevalence than CAs (Lee, Brancati, & Yeh, 2011). In addition, CAs with low BMIs and large waist circumferences have a higher risk for diabetes than similar Whites (Rajpathak & Wylie-Rosen, 2010). Given these health inequities, in this article, we examine to what extent printed health communication materials are designed to address the culture-specific needs of Chinese Americans with type 2 diabetes to reduce health disparities for this particular group.

Cultural Appropriateness, Health Literacy, and Health Disparities

Originally introduced in the U.S. in 2000 by the Office of Minority Health, the National Standards for Culturally and Linguistically Appropriate Services (CLAS) were created to guide the nation's health providers and healthcare organizations toward reducing healthcare disparities (USDHHS, 2001). Recognizing the increasing diversity in the U.S., the importance of culturally competent healthcare, and long-standing health disparities, the CLAS was recently enhanced and updated (in 2013), adopting a more complex definition of culture that moves beyond just race, ethnicity and language and also focuses on geography, religion, spirituality, biological and sociological characteristics (OMH, 2013). The enhanced CLAS now has as its principal standard, to "provide effective, equitable, understandable, and respectful quality care and services that are responsive to diverse cultural health beliefs and practices, preferred languages, health literacy, and other communication needs" (OMH, 2013, p. 13). The continued evolution of CLAS standards demonstrates that healthcare and health communication in the U.S. can still be improved regarding the needs of culturally diverse people.

One reason for the difficulty in improving culturally-appropriate care may stem from the different ways culture is conceptualized and studied in health communication research. Resnicow et al. (2000) distinguish between surface and deep levels assessments of culture. Surface level structure "involves matching intervention materials and messages to observable social and behavioral characteristics of a target population" (p. 273) such as using pictures of people or familiar music, language, foods, brand names or locations. These surface level indicators of cultural sensitivity are treated as static traits that act as predictable variables for developing health communication strategies. On the other hand, a deeper analysis examines cultural dimensions of healthcare such as "how members of the target population perceive the cause, course, and treatment of illnesses as well as perceptions regarding the determinants of specific health behaviors" (Resnicow, et al., 2000, p. 274). As Resnicow et al. conclude, attention to surface structure culture is useful for receptivity and comprehension, while a focus on deep structure should lead to salience and increased impact. Therefore, assessments of cultural appropriateness should examine culture on both levels.

Culturally competent health communication and health literacy are integrally related and both research areas are concerned with decreasing health disparities (Lie, Carter-Pokras, Braun, & Coleman, 2012). Health literacy has been defined in many ways (Cameron, Wolf, & Baker, 2011) with some definitions focusing on health literacy as a clinical risk and others conceptualizing health literacy as a personal asset or outcome of health education (Nutbeam,

2008). In this article we will use the latter understanding focusing on health literacy as “an outcome to health education and communication that supports greater empowerment in health decision-making” (Nutbeam, 2008, p. 2074). Instead of a barrier to health communication, tailored health communication and education can lead to improved health literacy which can lead to better health decision-making and outcomes.

Many scales and measurement devices exist to assess the health literacy of any given print communication and are typically designed to allow for a relatively quick assessment (see Cameron et al. (2011) for one overview). One widely used measure specifically designed for testing printed materials that takes into account culture, is the Suitability Assessment of Materials (SAM) instrument (Doak, Doak, & Root, 1996). One of the six dimensions of the SAM instrument related specifically to culture is *cultural appropriateness* and includes two scores: 1) match in logic, language, and experience, and 2) cultural image and examples. While both of these scores can be used to evaluate surface and deeper structures, the instructions for SAM focus more on surface level attributes. For example, the first score mentions that including vegetables such as asparagus and romaine lettuce may not be culturally matched if those in the target audience do not eat those vegetables. The SAM instrument is designed to allow a scorer to assess a print health document and obtain a numerical score of suitability in about 30 minutes. Its strengths are its systematic assessment criteria, speed, and relative ease of use. However, such quick assessments may fail to uncover any deeper structure cultural assumptions/constructions and both are important for evaluating a document’s receptivity and salience.

Despite efforts to improve health literacy, unfortunately, national studies indicate that only 12% of Americans are proficient in health literacy and as many as 14% fall in the *below basic* category of health literacy (Kutner, Greenberg, Jin, & Paulsen, 2006). Low health literacy (LHL) is often associated with cultural/ethnic/racial differences in health interactions (Lie, et al., 2012) and lower overall health status (Sentell & Braun, 2012). These associations may be exacerbated by limited English proficiency (LEP). In a study of California residents, Sentell and Braun (2012) found that individuals with LEP and LHL had the highest prevalence of poor health. Specifically, Chinese Americans with LEP showed the highest rates of LHL (68.3%) compared to 18.8% of Whites with LEP, 17.9% of Latinos and only 8.1% of Vietnamese. The authors conclude that these discrepancies may align with differences in some groups’ access to and use of translators or in-language materials. This is especially troubling given that nationwide 75% of Chinese Americans speak a language other than English in the home and 42% have LEP (APALC & AAJC, 2011). At a minimum, as a surface level consideration, printed health education materials need to be created in Chinese for LEP CAs.

While spoken Chinese has hundreds of dialects, there are two common written scripts – traditional and simplified. Mainland China adopted simplified characters in the 1950s-60s to be used as their standardized writing system, whereas Taiwan, Hong Kong, and Macau are still using traditional characters (Kane, 2006). Knowing traditional characters enables readers to learn simplified characters because simplified are derived from traditional characters with reduced strokes and simplified radicals. However, moving from simplified to traditional is more difficult. In healthcare increased attention is paid to the varied literacy

needs of Chinese throughout the world and numerous scales that were previously available only in English or traditional Chinese are being translated and validated into simplified Chinese.¹

There is a small but growing body of work examining type 2 diabetes specifically among CAs. Research has described Chinese Americans' health beliefs (Chesla, Chun, & Kwan, 2009) and practices (Xu, Pan, & Liu, 2010), and tested culturally tailored diabetes self-management education programs (Wang & Chan, 2005). A recent review established best practice guidelines for overall health communication with CAs about type 2 diabetes (Ho, Chesla, & Chun, 2012). Especially relevant for printed health materials, Ho et al.'s (2012) review concluded that health messages should focus on both the social and physical consequences of diabetes, address patients' beliefs and practices regarding Chinese medicine, foods, and eating, and engage family members as part of the diabetes self-care. However, research has not yet examined (from both a surface and deep structure level) the cultural appropriateness of available health documents.

Printed health information is just one source of health education materials. However, given how pervasively these materials are used, they constitute an extremely important source of potentially culturally and linguistically appropriate health information for those with diabetes – one that patients can repeatedly come back to for reference outside medical establishments. Scholars recognize the importance of health communication outside the clinical encounter and print materials are one way of increasing the amount of material that a clinician can communicate with a patient (Cameron, et al., 2011). Because they are written in Chinese they also serve as a linguistically appropriate form of health communication for those whose preferred language is Chinese. In a study of Chinese Americans with diabetes, Hsu et al (2006) found that participants preferred using diabetes health information from health providers or newspapers as opposed to using printed health information. The authors explain that this may have been caused by a lack of suitable Chinese language health education materials. In Chinese Americans, as in the general public, print materials are an important resource for affecting health behavior. More recent studies are not available about preferred sources of health information for CAs, but as more printed health information for this population is developed, it is important to assess the cultural relevancy of such materials. Therefore, the research questions that guided this work were:

1. What is cultural about printed type 2 diabetes health information for Chinese Americans?
 - a. What surface-structure markers of culture are used?
 - b. What deep-structure markers of culture are used?
2. Are the materials culturally appropriate for Chinese Americans with type 2 diabetes?

¹Numerous very specific examples abound ranging in scope from the Iowa Infant Feeding Attitude Scale (Chen et al., 2013) to the Core Outcome Measures Index (COMI) for low back pain (Qiao et al., 2013).

Method

Documents and Data Collection

Data consisted of 16 fliers, pamphlets and booklets collected from five different organizations. The documents were printed in either separate Chinese or English versions or a combined bilingual version presenting Chinese and English side-by-side. These handouts were chosen because these were the print resources available in many health clinics serving CAs in the San Francisco area. Many of these documents were distributed in print as patient education material and/or were accessible as downloadable documents on local health agencies' websites. We decided to include these diabetes materials because these were the documents available to the community with whom we work.

In San Francisco, Asian Americans constitute 33% of the city's population, and CAs are the largest Asian American group, representing one out of every five residents (152,000 individuals). The majority of CA adults in San Francisco (81%) are immigrants, 50% report speaking English poorly or not at all, and they are more likely to have lower household incomes than whites (NICOS, 2004). Despite the presence of several health agencies that cater to monolingual CA immigrants, access to formal diabetes education programs in Cantonese or Mandarin are limited. Although these services are increasing, in one recent study, the majority of CA patients (60%) obtained their diabetes knowledge from primary care providers rather than within formal classes (Chesla et al., 2013).

The texts ranged in size from a 1-page handout to a 67-page booklet. Because some organizations had different versions of the same material, some of the documents were redundant. See Table 1 for more detailed information about each of the texts.

Some of the documents were created by local health agencies including those from Chinese Community Health Resource Center (CCHRC), California Pacific Medical Center (CPMC), and Northeast Medical Services (NEMS). The other documents were created by national organizations/corporations (Merck, The National Diabetes Education Project). Some of the documents were used specifically in diabetes education programs (see Sun, Tsoh, Saw, Chan, & Cheng, 2012), and all were available to providers to distribute to patients with diabetes. We included all materials that were available in health clinics catering to CA populations.

Data Analysis

Most of the documents were printed in both English and Chinese. The second author is fluent in English and Cantonese and is able to read both traditional and simplified Chinese characters. She compared document translations and noted any places where translations were not exact either because of colloquial phrasing used in English and Chinese or just a difference in translation. She then translated these sections into English for analysis.² Generally speaking, there were very few places of difference, around 1–2% of the

²We did not use a professional translation service in reading the Chinese documents. However, to confirm the work of the second author, we gave a sample of the materials (one full document and a selection of translation differences) to a Chinese language and linguistics professor who has done professional translation work. He confirmed the points made by the second author.

documents had these discrepancies and the translation quality and clarity in both languages were very high and easily understandable. Discrepancies, although rare, did occur in two forms. First, some Chinese and English sections had different wording. This is to be expected as not everything in English has a literal translation into Chinese (and vice versa) and strong translations should not have exact equivalents. One example is an English document that states, “With the support of your family and friends, your healthcare team, and your community, you can *take charge of* your diabetes” (emphasis added). In the Chinese document, the phrase used for *take charge* is: “積極面對” which could literally be translated as “assertively face” instead of “take charge.” However, the meaning in this sentence (about facing your diabetes in a positive/assertive fashion), while not literally equivalent, is semantically equivalent. Second, the Chinese and English documents may have had similar wording when it should not have. For example, in a sentence about creating an “exercise program” in English, the Chinese document used the term “運動” which means exercise, but in the sports/training sense of the term. A better translation/phrase could have been “鍛煉計劃” meaning an exercise program. We noted each of these discrepancies to see what if any effect they had on the overall readability of the documents. Because they did not affect the overall meaning, we felt comfortable analyzing the English versions of the documents and English translations of any discrepant sections.

We analyzed the texts using discourse analysis focusing on how meanings – especially of health and culture – are socially constructed (Tracy, 2001). First, we read the documents for how they delivered health messages in light of the best practices presented earlier (Ho, et al., 2012) using a relatively surface structure examination of culture such as language and cultural images. The first two authors agreed on these instances. Second, the documents were further analyzed for its deeper structure from a discourse analytic perspective (Gee, 2011) paying attention to how the texts construct, maintain, or contest particular cultural understandings of diabetes and diabetes treatment and downplay or ignore other understandings (Dutta, 2007). In this analysis, we examined culture both in terms of what might be labeled Chinese specific understandings, worldviews, or health practices and in terms of cultural practices and understanding of diabetes management itself. We also examined the translation discrepancies to see if these pointed to important cultural differences. We conducted this analysis iteratively going back and forth from initial analysis back to texts to refine our analysis until we settled on the themes of management, control and balance. The first two authors then went back through all texts to look for examples of diabetes management, control and balance and reached agreement on exemplary quotations. In the next sections we present our findings.

Surface Structure Markers of Culture

The four most obvious surface level cultural markers were their printing in Chinese, pictures of Asian people, inclusion of Chinese foods, and reference to Chinese exercises. Using the criteria of *match in language* and *use of cultural image and examples*, these documents were overall very strong, and at times, these sections showed glimpses of deeper level culture. In the following sections, we discuss in more detail how each aspect worked to increase or decrease the cultural competency of the documents.

Language

At the most basic level, health messages need to be disseminated in appropriate and preferred languages, and the widespread availability of these health materials in Chinese and English meets established baseline best practices. As mentioned earlier, the Chinese language versions of materials were well written and were equivalent in meaning to the English documents. The example presented earlier of the translation discrepancy of the Chinese “assertively face” versus the English “take charge” demonstrates that the documents were well-crafted in a linguistically appropriate manner for Chinese readers. However, the documents that we collected were all printed using traditional characters. For that reason, these documents may not be as culturally sensitive to the literacy needs of more recent Chinese immigrants from mainland China who use simplified characters.

Pictures

All the Chinese language documents that used pictures of people included only Asian models. On the other hand, many of the English equivalent documents included a multicultural motif including many different non-White models. For example, in the “4 Steps to Control your Diabetes for Life” brochure, the English cover had five photos only two of which used noticeably Asian people. The Chinese version of the same brochure only used two pictures (different from the English) on the cover of Asians. From a practical standpoint, this makes sense as the English version is likely distributed to a wider audience than the Chinese language pamphlet. The inclusion of appropriate pictures is what is important from a surface level reading.

Food

There were many surface level examples of culturally appropriate foods. From lychees to rice porridge, all of the locally produced documents that gave food examples (CPMC, CCHRC) included common Chinese foods. The Merck and NDEP brochures did not mention Chinese specific foods and instead presented information about healthy foods such as “fruits and vegetables, fish, lean meats, chicken or turkey without the skin” (NDEP 4 Steps). While Chinese people certainly eat these foods, there was a difference between this presentation and “Limit white rice, rice porridge, glutinous (sticky) rice and rice products such as cheong-fun, mei-fun, ho-fun, rice dumplings, rice balls, and rice cakes” (CCHRC Diabetes Management). The former may still be culturally appropriate. However, the latter is likely culturally stronger.

Food was a topic that allowed for a deeper level analysis of culture. For example, one document called *Asian Food Guide* (in English) was available in other languages including Cambodian, Chinese, Korean, Laotian, and Vietnamese. The guide included such Asian foods as congee, wonton wraps, lychee, and winter melon. However, the Chinese language version of this document was titled “*Chinese Food Guide*” not “*Asian Food Guide*” and contained the exact same foods listed. While this is a subtle translation difference, it may point to the fact that what makes the guide Chinese is the fact that it is written in Chinese, not that there are different Chinese (as opposed to Laotian or Vietnamese) foods included. In other words, the title should probably read “Asian-Food” guide in English (focusing on Asian food). But in Chinese, it should read “Chinese” Food-Guide (focusing on using

Chinese language). In addition, not all of the foods listed were obviously Asian or Chinese. In fact, it also included foods such as mayonnaise, cottage cheese, and hamburger buns, which are not elements in an Asian diet but may be eaten by some Asian Americans depending on acculturation and personal preferences. What this demonstrates is the difficulty in clearly determining what might be considered Asian or Chinese in an effort to provide culturally-sensitive materials.

Besides the actual foods, the documents also presented different ways of eating foods. A subtle difference in translation around how to eat demonstrated a glimpse at a deeper level cultural sensitivity. In three out of eight documents that provided explicit food measurement recommendations, the Chinese term for *bowl* was used for the English measurement term *cup*. A previous study of CAs and diabetes management demonstrated that while CAs know to adjust their diets, they do not regularly measure the amount of food consumed as part of their dietary changes (Washington & Wang-Letzkus, 2009). In that study, in the few instances in which people did report measurements, participants typically spoke about amounts of food in less explicitly numeric ways such as “a bowl of ‘hot soup’ or ‘cup of ‘vegetable juice’” (Washington & Wang-Letzkus, 2009, p. 314). These descriptors focused on *how* something is consumed (in a bowl or cup) as opposed to measurements such as measuring cups or ounces. In our data set, this translation discrepancy may more closely align with Chinese understandings of food and eating and in fact may be more culturally appropriate. The CCHRC Diabetes Management booklet provided suggestions for the amount of starchy carbohydrates to eat at each meal. This booklet was printed with English on one side of the page and Chinese on the adjacent side. The Chinese stated “Approx. 1 *bowl* cooked rice/noodle/cereal... 1 *bowl* = 8 oz” and in the English, it stated “Approx. 1 *cup* cooked rice/noodle/cereal... 1 *cup* = 8 oz” (emphases added). While the difference is subtle, the Chinese may be more culturally appropriate and may begin to link the measurements that are actually used (a bowl used to eat rice or noodles) with quantitative measurements (8 oz.) and thus assist Chinese who are not as accustomed to measuring their food. At the same time, it is important to recognize that the pamphlet also provided a quantitative measurement for a bowl because bowls obviously range in size.

Exercise

Most of the documents with exercise recommendations suggested activities such as walking, bicycling, and other low-impact exercises. Only one document recommended what might be recognized as Chinese exercises: Tai Qi and Loo Tung Chuan (CCHRC Diabetes Management). These were presented in a list of exercises along with walking, swimming and others. The document also recommended avoiding Chi Kung, Qi Gong, heavy weight lifting and other high impact exercises. While it is culturally important to include exercises with Chinese origins, the mere inclusion of these is relatively surface level in its cultural sensitivity. Instead of talking about how Tai Qi might function as a foundation for health and stimulating Qi, it was merely listed as one of many exercise options equivalent to swimming or walking.

These health documents had little to no information about the use of medicinal foods, herbs, or other Chinese medicine treatments for diabetes. Despite research that demonstrates that

CAs often use everyday foods and specialty medicinal foods to treat diabetes and other illnesses (Chesla & Chun, 2005), there was no mention of this practice or any suggestions for how this practice could be incorporated into diabetes-related diet suggestions. The lack of herb recommendations is easily explained in part because there is little scientific evidence in human studies to guide such recommendations (Covington, 2001). However, the lack of any recognition that patients are using herbal medicines and eating Chinese medicinal foods is clearly not culturally relevant. Health education materials, while not advising the use of Chinese herbal medicine, could at least guide persons with diabetes to discuss their herbal medicine use with their healthcare providers. This is especially important because some CAs receive herbal medicine recommendations from friends and neighborhood herbalists and may not think to disclose this information to health providers (Wang & Wylie-Rosett, 2008).

Cultural Construction of Diabetes: Deeper Structure Culture

The overarching goal of all of the printed health materials was to educate readers about diabetes and how to manage the disease. Therefore, it is not surprising that a major theme that arose from the materials was *management*. However, by deepening our notion of cultural, we can begin to understand these pamphlets as both reflecting and reinforcing a *particular* cultural understanding of health that may not align with CAs' own health ideas. The overarching goal of these pamphlets – to manage and control – are typical of how diabetes self-management is usually presented and can be seen as a goal of biomedical care for diabetes (Gomersall, Madill, & Summers, 2011). Underlying both of these constructions is the assumption that people want to take control of their diabetes as an important life priority. This stands in contrast to a Chinese understanding of health and healthcare that focuses more on the idea of balance and homeostasis (Chesla, et al., 2009). Physical health may be an important priority but emotional, spiritual, psychological, and social considerations also play a role in determining how to balance one's life. Examining culture on these deeper levels problematizes taken for granted conceptualizations of health and healing that are not actually universal. In the following sections, we examine the pamphlets' cultural construction of diabetes care as management and control and then explore the possibilities for an alternative construction using balance.

Manage

Successful diabetes management is presented as the ultimate goal for those with diabetes. However, successful management is also portrayed as extremely complicated, encompassing a wide scope of activities, mostly dealing with physical health. The major domains for diabetes management that are addressed in every comprehensive pamphlet included measurement and recording of blood glucose, diet and exercise guidelines, and foot and eye care. Successful diabetes management focused on two related issues: 1) the importance of measurement and 2) managing the dialectic between management as a daily process and management as a preferred end state.³

³People with type 2 diabetes monitor current blood glucose levels (using a finger-stick and a glucometer) as well as long-term blood glucose levels using the hemoglobin A1C (a blood test that indicates variations in blood glucose over the last 3 months). Maintaining stable glucose levels is important to preventing more serious problems such as heart disease, kidney disease, amputation, or blindness.

Management and measurement go hand in hand in these texts. In fact, blood glucose management was centrally important in all pamphlets and has been described as the goal of a Western/biomedical approach to diabetes treatment (Covington, 2001). While measurement is certainly important for managing a chronic disease such as diabetes, previous research has also shown that many CAs do not understand what effect diet and exercise has on their measurements (Jayne & Rankin, 2001). In fact, the pamphlets differed in how much instruction was given about what to do with those measurements:

Example 1: Record your targets and the date, time, and results of your checks. Take this card with you on your health care visits. Show it to your health care team (4 Steps to Control your Diabetes for Life).

Example 2: Talk to your health care team about your blood glucose targets. Ask how and when to test your blood glucose and how to use the results to manage your diabetes (4 Steps to Control your Diabetes for Life).

Example 3: Learn to recognize the symptoms of low blood sugar, which may include feeling nervous, shaky, sweaty, or tired.... If you have signs of low blood sugar, test your blood right away. If your blood sugar level is less than 60 mg/dL, eat or drink a carbohydrate immediately, such as a cup of juice (4 oz.), 3 teaspoons of honey, or 3 to 5 pieces of hard candy. You may need to have a meal or another snack within 30 minutes. (Merck Today's Your Day)

In example 1, the act of checking, recording, and reporting appears to be what counts as good management. Example 2 presents the idea that measuring and recording, with the help of a health provider, is the basis for making useful adjustments for better management. However, in both cases, neither document explains how an *individual* can use the information collected. Compare these with the third example that offers concrete and specific measurements and explains how to make adjustments (eat or drink, eat again in 30 minutes) based on the measurements. This last example provides the best form of self-appraisal information. However, this was not typical and was the only example of such detailed instructions.

Managing diabetes is both a daily task and a learned set of skills to be patiently and diligently mastered over time, leading to a useful lifetime process:

You don't have to make all these changes at once. Take small steps. Set a manageable goal each day, and work to achieve it. Celebrate every improvement you make, no matter how small. Feel good about your efforts to manage your diabetes. (Merck Diabetes and Me).

These supportive statements recognize that diabetes management is a difficult process that takes time to fully achieve.

Despite the recognition that diabetes management is an ongoing daily process, documents also focused on presenting diabetes management as an end goal as well. As one booklet stated: "Combined with a healthy diet, regular physical activities may lower your need for insulin or diabetes medications. In fact, some people can manage their diabetes by diet and exercise alone." (CCHRC Diabetes Management). While health providers understand that

only those patients in the early stages of diabetes may be able to manage without drugs or with fewer drugs, a possible interpretation from this pamphlet is that one could, through diligent regular management (diet and exercise), use fewer or no drugs and still manage their disease. We will discuss this further in the section on balance.

Control

While management seems to imply dealing with the constant flux and movement of blood glucose and diabetes in general, the ultimate goal of diabetes management is presented as control. Diabetes as a disease itself needs to be controlled and patients are taught to control the measurement indicators of diabetes such as blood glucose. For example, sometimes control is aimed at the indicator: “People with diabetes must work to control their blood sugar, blood pressure, and cholesterol to help prevent the negative effects of diabetes...” (Merck Today’s Your Day). Other times, it is the diabetes itself that needs to be controlled, “It may help to realize how much control you do have over your diabetes” (Merck Today’s Your Day).

Control is presented as an achievable end goal and all of the documents recognize how difficult these efforts are that must be taken to achieve control. People with diabetes must “work to control” but “your efforts can help control the disease and help you to live a long, healthy, happy life” (Merck Today’s Your Day). In these documents, the implication is that having diabetes is already seen as being out of control. People are reminded that they can regain control of certain parts of their bodies: “even if you have been diagnosed with diabetes, you can take control to keep your eyes and body healthy” (NEMS Keeping Your Eyes Healthy).

One main focus of control is on stability, ensuring blood glucose levels do not vary too much from an acceptable range. Stability is both a desired outcome and a key marker that one is under control and therefore healthy. As one document stated:

It is common for people who are getting their blood sugars under control to experience fluctuations in their vision while the sugars normalize at a new, good level (NEMS Diabetes Affects the Eye).

In this example, the expressed goal is to control and stabilize blood sugar. One side effect of fluctuations in blood sugar is corresponding fluctuations in vision. This statement is both informative (explaining that fluctuations can be anticipated) and persuasive (once one is able to control blood sugar, vision will also be stabilized).

While diet, exercise and foot care were all described as important to diabetes *management*, these three areas were not presented using the terminology of *control*. Instead, the documents point only to controlling one’s weight as a goal of diet and exercise. For example:

Exercise regularly: physical activity strengthens the heart, helps to control weight and improves blood sugar control. It may even decrease your need for insulin or medication. (CCHRC Diabetes)

In this case, control functions in successive steps. Exercise works to control weight, which works to improve blood sugar control. The positive benefit of such control is the decreased need for medication and insulin.

Contrast the above examples with the Merck Diabetes and Me pamphlet that explains: “Uncontrolled high blood sugar, when present for a long time, can cause health problems, such as heart disease, kidney disease, blindness, and poor circulation, which may lead to limb amputation.” The previous two examples focus on positive benefits of control. This example, contrastingly, persuades through presenting a threat. Previous health promotion research concludes that when using fear appeals, it is important to present threats that are fear-inducing enough to be taken seriously along with actions that a person feels capable of accomplishing that can avoid those threats (Murray-Johnson & Witte, 2003). In this case, the action of control is implied, rather than stated. One might read that since uncontrolled blood sugar leads to the threat of heart disease and other problems, controlling blood sugar will prevent those threats. This action component is more explicitly stated later in the same pamphlet:

Between 60% and 70% of patients with diabetes have nerve damage, mostly in the nerves of the feet and legs. Controlling your blood sugar can help prevent or delay nerve damage and related problems. (Merck Diabetes & Me)

Notably, the documents that use fear appeals (such as loss of limbs or vision, and death) all present information about how to avoid those losses using control vocabulary as opposed to management. For example: “Controlling your blood sugar and blood pressure can help prevent or delay kidney disease” (Merck Diabetes & Me). Control, thus more serious than management, is presented as the key to avoiding major diabetes-related problems.

Although research recognizes the importance of family and social support for CAs with diabetes (Chesla & Chun, 2005), the health documents primarily suggest that diabetes control is an individual responsibility. Only the Merck documents explicitly mention getting support from family, friends, or support groups as a way for you, the individual, to “take charge of your diabetes” (Merck Today’s Your Day). Another document used family as an incentive. The flier contains a picture of an older Chinese couple walking hand-in-hand with a young boy and the title reads: “Two reasons I find time to prevent diabetes... my future and theirs” (NDEP Two Reasons). In another example, which more explicitly focuses on individual control, the document states in English:

Controlling diabetes is very much about making good lifestyle choices – things that **you** can control. Use the power of information to help you actively take control. (Merck Today’s Your Day).

The implication of individual personal responsibility is emphasized in the use of the bold **you**. Individual responsibility ignores any of the social, economic, and political conditions that may affect one’s ability to control their diabetes (Gomersall, et al., 2011) and only one document included a resource section describing Medicare, Medicare Part D, and prescription services assistance (Merck Today’s Your Day).

Balance

Despite recognition that CAs may understand *balance* in healthcare better than *control* (Chesla, et al., 2009; Covington, 2001), very few health documents even mentioned the term and none use the concept of balance. In fact, the term appears only seven times in two different documents both published by Merck (one is a smaller version of the larger document). Of these seven cases, three are repeated in both pamphlets such that there are really only four different uses of the term balance. In all of those instances, the term used is actually *imbalance*, which is used to define diabetes:

Sometimes the liver makes more sugar than the body needs, which causes the blood sugar level to get even higher and out of balance. (Merck Diabetes & Me and Today's Your Day)

All instances of imbalance were similar to this example focusing on blood glucose imbalance as the main physical problem of and explanation for diabetes.

From a holistic Chinese medical perspective, imbalances are the disease-states and the goal of treatment is to fix disharmonies to return to, as close as possible, a state of homeostasis not just regarding diabetes but in the whole body physically, psychologically, and emotionally (Covington, 2001; Kaptchuk, 2000). Unlike biomedicine, which views diabetes as an insulin imbalance, there are three types of *xiao ke* (the closest equivalent of diabetes in Chinese medicine). The types correspond to *yin* deficiencies in the lung, stomach or kidneys and manifest symptoms of excessive thirst, excessive hunger, or excessive urination respectively (Covington, 2001). The documents' use of the term imbalance is similar, but not equivalent to, the Chinese medical understanding of balance that focuses on holism. While one could read a holistic interpretation into these diabetes materials (a goal is to maintain blood glucose balance through a combination of diet, exercise and drugs to avoid diabetes complications), the documents seem to only focus on imbalance as an explanation for diabetes as opposed to presenting balance as a goal for diabetes self-management. Take this second example:

In this type of diabetes, the body does not make enough insulin or the insulin that the body makes does not work the way that it should. The body may also keep making sugar even though it does not need it. Once a person has type 2 diabetes, it does not go away. (Merck Today's Your Day)

As this demonstrates, diabetes is a life-long illness and the goal for living with diabetes is either management or control to avoid worse complications. This may run counter to some CAs' beliefs for two reasons. First, there is the belief that diabetes is a curable (not-chronic) disease (Jayne & Rankin, 2001) and that if sugar consumption is controlled, glucose monitoring, diet and exercise are not necessary (Washington & Wang-Letzkus, 2009). Like others with diabetes, some CAs have a hard time taking early-stage diabetes seriously because there are few negative symptoms (Jayne & Rankin, 2001) and other priorities such as family harmony and large social eating rituals may be more immediately important. Second, some CAs may additionally have a hard time thinking of controlling their diabetes given their holistic sense of health. A discussion of balance/imbalance may fit more easily into their cultural health expectations because in Chinese medicine diagnosis, subtle

imbalances and disharmonies can be assessed through tongue and pulse diagnosis long before they manifest into diseases (Kaptchuk, 2000). Therefore, Chinese medicine treatment is always a matter of correcting imbalances even when no outstanding symptoms exist. In other words, health education materials (regardless of the language) that present diabetes as *this kind of holistic imbalance* that requires lifestyle changes and support from family/social networks may be more successful at achieving behavior changes than those that emphasize only the permanent imbalance of diabetes and the near impossibility of maintaining control over this imbalance.

Conclusion

Health education materials are continuously being improved to meet cultural appropriateness/health literacy standards. From a surface level, this may include such traits as using the appropriate language (e.g. simplified Chinese) and including culture-specific activities, pictures and testimonies. From a deeper level, understanding the complexity of what is cultural about a document means acknowledging the importance of different understandings of health that may be taken-for-granted even beyond the language itself. What has typically been treated as the norm – a biomedical approach to the understanding and treatment of diabetes that focuses on management and control – may not be as culturally relevant to CAs who begin with different health beliefs. In this article, we explore an alternative framing of balance but also recognize that even among CAs there is heterogeneity of health beliefs. Not all CAs believe in holism and the idea of balancing *yin/yang* may be more foreign than the idea of measuring and controlling blood glucose.

A nuanced assessment of both surface and deeper levels of culture is essential for creating health education materials that can increase health literacy that leads to better health outcomes. On a surface level, the documents need to be culturally relevant and minimally accessible in order to meet culturally appropriate health literacy standards. In other words, they need to be readable and understandable by those using them. However, from a deeper level, these health education materials may not be used if they do not address health and healthcare in culturally appropriate or understood ways. From a literacy perspective, these documents may be readable, but they may not actually be very persuasive.

This study is limited by the materials used for study. Future research should examine more health education materials including online sources and include materials distributed in other geographic areas in the US and elsewhere including China, Hong Kong, Taiwan, or other areas with many Chinese. In addition, ethnographic research can be conducted with CAs to see how they actually read these documents. Although our analysis focused on cultural constructions of health, we do not know how actual CAs would read and interpret the documents and their health constructions. We also recognize the limits of not using professional translators to examine in full detail each Chinese/English discrepancy. Future research could certainly take a fine-tuned linguistic comb to these documents to search for even more deep cultural concerns. Additional research should also examine CA health beliefs around the idea of balance as it is applied to diabetes. It is currently unknown if a state of balance can be achieved given the seemingly permanent imbalance that is diabetes. Knowing more about how CAs approach diabetes and whether the treatment goals should be

framed as management/control or if balance is a possibility may lead to more culturally appropriate health education.

Despite these limitations, this study has important implications for health educators and health providers. While culturally sensitive health education materials are now more widely available for CAs, those materials can always be improved on both a surface and deeper level. For example, rather than merely listing Asian foods, health education materials could better recognize and address how CAs eat those foods. Culturally appropriate devices for gauging food amounts (bowls with measurements) could be consistently presented. New approaches, like the “plate method” of composing a meal could be developed for a Chinese diet where bowls may be more common. Guidance is needed for patients to work with the social context of meals (e.g. large family gatherings and meals prepared by others). In addition, health materials could present more extensive exercise recommendations. Rather than merely listing the exercises, understanding how CAs practice something like Tai Qi – in San Francisco, often in public and with friends – may lead to better implementation of these exercises.

Explicit acknowledgement of holistic health beliefs including balance and homeostasis that likely form a background health understanding for many CAs might increase both the receptivity and the salience of educational materials. Although care must be taken in communicating the chronicity of the disease, presenting diabetes care expectations around a goal of balance is culturally syntonetic, and requires a relatively minor shift in imagery away from control. Subtle changes in writing can work to construct a different way of approaching diabetes management. For example, recommendations for exercise type and amount might explicitly reference how exercise can help balance glucose levels in the body. Similarly, recommendations for glucose monitoring might be presented as “finding the right balance that works for you and your diabetes.” In Chinese there are multiple terms for balance. The term 平衡 means balance and can be used in health situations but does not imply homeostasis. Whereas 體內平衡 (with the same last two characters for balance) means homeostasis. Both of these forms of balance could be used to usefully present diabetes self-management goals in a more culturally syntonetic way.

While researchers and healthcare providers alike recognize the importance of providing culturally appropriate care, it is not always clear exactly how to do so. Even the best of efforts to hit the checklists of best practices can sometimes leave some areas unaddressed. In this article, we used a more expansive understanding of culture – from both a surface and deep structure – to look beyond static traits and recognize cultural understandings of disease etiology and experience in an effort to improve health disparities for CAs with type 2 diabetes.

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Table 1

Printed Health Education Materials

Publication Name	Publication Type	Goals	Language(s)
Merck Today's Your Day	29-page Booklet	Education/Management/Record Keeping	Chinese, English
Merck Diabetes & Me	Front-to-back Handout adapted from booklet	General Education	Chinese, English
The National Diabetes Education Project (NDEP) Take Care of Your Heart	Front-to-back Handout	Diabetes Heart Health	Chinese, English
NDEP Two Reasons	Front-to-back Handout	Pre-Diabetes & Diabetes Prevention	Chinese, English
NDEP 4-Steps to Control	17-page booklet	Education/Management/Record Keeping	Chinese, English
Chinese Community Health Resource Center (CCHRC), San Francisco, Diabetes Management	67-page booklet	Education/Management/Record Keeping	Chinese & English
CCHRC Diabetes; Blood Sugar; Carb Count; Dental; Eye; Foot; Gestational; Sample Meal	9 separate 1–2 page fliers mostly adapted from booklet	Topics included: diabetes general, carbohydrates, blood sugar, dental, diet, eye and foot care, sample meal, and gestational diabetes.	Chinese, English
California Pacific Medical Center (CPMC), San Francisco, Meal Planning	1-page flier	Food guide – text	Chinese, English
CPMC Asian Food Guide	6-page handout	Food guide w/illustrations	Chinese
Northeast Medical Services (NEMS), San Francisco, Diabetes Affects the Eye	6-fold pamphlet, 1 page front-to-back	Eye information	English & Chinese
NEMS Keeping Your Eyes Healthy	6-fold pamphlet, 1 page front-to-back	Eye health management	English & Chinese
NEMS Treatment for Diabetic Retinopathy	6-fold pamphlet, 1 page front-to-back	Eye disease treatment	English & Chinese