



Published in final edited form as:

Patient Educ Couns. 2015 November ; 98(11): 1360–1366. doi:10.1016/j.pec.2015.06.011.

Disclosure of Complementary Health Approaches among Low Income and Racially Diverse Safety Net Patients with Diabetes

MT Chao^{a,b}, MA Handley^{a,c,d}, J Quan^{a,d}, U Sarkar^{a,d}, N Ratanawongsa^{a,d}, and D Schillinger^{a,d}

^aDivision of General Internal Medicine, University of California, San Francisco, San Francisco, California, USA

^bOsher Center for Integrative Medicine, University of California, San Francisco, San Francisco, California, USA

^cDepartment of Epidemiology and Biostatistics, University of California, San Francisco, San Francisco, California, USA

^dUCSF Center for Vulnerable Populations at San Francisco General Hospital, San Francisco, California, USA

Abstract

Objective—Patient-provider communication about complementary health approaches can support diabetes self-management by minimizing risk and optimizing care. We sought to identify sociodemographic and communication factors associated with disclosure of complementary health approaches to providers by low-income patients with diabetes.

Methods—We used data from San Francisco Health Plan's SMARTSteps Program, a trial of diabetes self-management support for low-income patients (n=278) through multilingual automated telephone support. Interviews collected use and disclosure of complementary health approaches in the prior month, patient-physician language concordance, and quality of communication.

Results—Among racially, linguistically diverse participants, half (47.8%) reported using complementary health practices (n=133), of whom 55.3% disclosed use to providers. Age, sex, race/ethnicity, nativity, education, income, and health literacy were not associated with disclosure. In adjusted analyses, disclosure was associated with language concordance (AOR=2.21, 95% CI: 1.05, 4.67), physicians' interpersonal communication scores (AOR=1.50, 95% CI: 1.03, 2.19),

Corresponding author: Maria T. Chao, DrPH, MPA Division of General Medicine – San Francisco General Hospital Osher Center for Integrative Medicine University of California, San Francisco UCSF Box # 1726, San Francisco, CA 94143-1726, USA Telephone: 415.353.7749 Fax: 415.353.9686 Maria.Chao@ucsf.edu.

Conflicts of Interest All authors contributed to the conception and design, and drafting and critical revision of the manuscript, including final approval of the version to be published.

Disclosure Statement No competing financial interests exist.

Informed consent and patient details We confirm that all patient/personal identifiers have been removed; persons described are not identifiable and cannot be identified through the details of the study. The University of California San Francisco, Committee on Human Research (institutional review board) reviewed and approved all of the study's procedures.

shared decision making (AOR=1.74, 95% CI: 1.33, 2.29), and explanatory-type communication (AOR = 1.46, 95% CI: 1.03, 2.09).

Conclusion—Safety net patients with diabetes commonly use complementary health approaches and disclose to providers with higher patient-rated quality of communication.

Practice Implications—Patient-provider language concordance and patient-centered communication can facilitate disclosure of complementary health approaches.

Keywords

complementary health approaches; integrative medicine; complementary and alternative medicine; diabetes; health communication; limited English proficiency; health disparities; disclosure

1. Introduction

Health practices outside of mainstream conventional medicine, referred to as complementary health approaches [1], are common among patients with diabetes [2–4]. There are many reasons why clinicians and patients with diabetes should openly engage in dialogue about these practices, including the high prevalence of use and varying risks and benefits. Complementary health approaches include a range of culturally specific practices and lifestyle preferences with therapeutic benefits on both metabolic outcomes and quality of life. For instance, in a randomized trial, a 24-week yoga intervention was associated with decreases in fasting glucose, insulin, and hemoglobin A1c at 6-month follow-up, and sustained changes in fasting glucose at 12 months [5]. Traditional foods including bitter melon, nopal (prickly pear), and ivy gourd are commonly believed to help with glucose control, though definitive evidence is lacking [6]. Tai chi and mindfulness-based interventions have been associated with improved quality of life and emotional well-being [7, 8].

With limited insurance coverage, expenses of complementary health approaches are paid predominantly out of pocket [9]. Using complementary health approaches may therefore adversely impact the ability to engage in positive health behaviors needed for effective diabetes self-management (such as paying for test strips, medications, gym fees, and healthy foods), particularly for those with limited financial resources. Among the same population described in this study, we found that low-income patients that used complementary health approaches spent an average of \$47 in the prior month on complementary health products and treatments, and were more likely to be non-adherent to their diabetes medications and to put off buying medications for food [10]. Having delayed or unmet medical needs related to cost is more common among adults with diabetes that use complementary health approaches compared with non-users [11]. In addition, over $\frac{3}{4}$ of adults with diabetes who use complementary health approaches also take prescription medications [3], raising concerns about possible interactions between drugs and herbal or dietary supplements, and potential impacts on blood glucose levels [6].

Discussions about complementary health approaches during the medical encounter can help to support patients' decision making to minimize risk and to forge a better therapeutic alliance, improving patient satisfaction [12] and the patient-provider relationship [13]. To

ensure safe and coordinated care, patient-physician communication about complementary health approaches was highlighted in a position statement by the American Diabetes Association [14], which stated that “Most patients do not openly share use of alternative therapies with their healthcare provider; therefore, it is recommended that patients be asked specifically about their alternative therapy practices.” Similarly, communicating about complementary health approaches has been the focus of *Time to Talk*, a public health education campaign launched by the National Center for Complementary and Integrative Health [15], which states that given the high proportion of patients with chronic and acute conditions that use complementary health practices, healthcare providers should be aware of the full range of conventional and complementary health practices their patients are using for effective care management.

Less than half of patients who use complementary health approaches discuss them with conventional healthcare providers, and disclosure is lowest among racial/ethnic minorities [16]. Language barriers appear to further exacerbate racial/ethnic differences in communication. Ahn et al. found that among Chinese- and Vietnamese-speaking patients at community health centers, less than 8% of patients that used complementary health approaches discussed them with their providers [12]. Aspects of patient-physician communication associated with optimal diabetes care, such as patient-physician language concordance [17, 18], health literacy [19, 20], and communication processes that support self-management [21], may influence patients' disclosure of using complementary health approaches. Strategies of evidence-based self-management support, such as behavioral assessment, shared decision making, and goal setting [22, 23], could be useful tools for improving patient-physician communication about complementary health approaches, but have not been assessed in diverse patients with diabetes. We sought to identify sociodemographic factors and aspects of health communication associated with disclosure of complementary health approaches among low-income patients with diabetes. We addressed the following research questions. Among diverse, low-income patients in safety net settings, how common are use and disclosure of complementary health approaches? Which sociodemographic factors are associated with disclosing use of complementary health approaches? What aspects of patient-physician communication are associated with disclosing use of complementary health approaches? What reasons do patients report for not disclosing their use of complementary health approaches?

2. Methods

2.1. Study Design

We used data collected for the Self-Management Automated and Real-Time Telephonic Support (SMARTSteps) Study, which was implemented by a regional Medicaid managed care program providing language-concordant automated telephone support and follow-up health coaching to low-income, ethnically diverse patients with diabetes that received care from safety net clinics. Detailed methodology, including study design, procedures, and data collection, has been previously described [24, 25]. In brief, the SMARTSteps study was conducted from 2009 to 2011 and included 362 participants aged 18 years or older, who had type 2 diabetes and received primary care at one of four publicly-funded clinics in the

Community Health Network of San Francisco. Interviews were conducted in English, Cantonese or Spanish. Use of complementary health approaches was determined at 6-month telephone follow-up among 278 respondents using a previously validated survey [26]. SMARTSteps participants who had used complementary health approaches in the past 30 days were included in analyses of disclosure of use.

2.2. Outcome Measures

Use of complementary health approaches in the prior month was assessed through 10 questions about “remedies and treatments that are not typically prescribed by medical doctors” using a survey developed for a prior multi-lingual study [26]. Participants were asked if they had used natural remedies such as teas or herbs; manual therapies like massage or acupressure; acupuncture; techniques such as yoga, meditation or tai chi; vitamins or nutritional supplements; homeopathic remedies; chiropractic treatments, energy therapies like Reiki or therapeutic touch; remedies or practices associated with a particular culture, like Chinese medicine, Ayurveda, indigenous healing, or *curanderismo*; or other alternative treatment or remedy. We created a dichotomous measure for prior month use of complementary health approaches (yes = used at least one complementary health approach, no= did not use any). Participants were also asked about their use of spirituality, religion or prayer for health reasons, but this domain was excluded from our summary measure of use to be consistent with prior studies of complementary health approaches and diabetes [3].

The primary outcome of this analysis was disclosure of complementary health approaches to providers. Among participants who had used at least one complementary health approach in the past month, we created a dichotomous (yes/no) variable based on participants' responses to the question: “Did you tell your doctor or your diabetes health care team about any of these treatments?” For those that responded no, we examined possible reasons for not disclosing use of complementary health approaches using close ended statements, such as not being asked, thinking the doctor did not want to or need to know, or feeling embarrassed or uncomfortable discussing complementary health approaches. Participants could choose multiple reasons for not disclosing their use of complementary health approaches.

2.3. Predictor Measures

Based on prior research of factors associated with disclosure of using complementary health approaches [16, 27–29], we assessed sociodemographic variables, such as age, sex, race/ethnicity, nativity (US or non-US born), educational attainment, and household income that were self-reported at baseline. In addition, we included the following measures of language and communication factors to identify associations and potentially modifiable factors of disclosing use of complementary health approaches.

Patient-physician language concordance—We categorized participants based on preferred language of interview. Those who preferred Spanish or Cantonese were asked how well their regular doctor speaks Spanish/Cantonese. Participants who responded that their regular doctor spoke Spanish/Cantonese “very well (like a native)” and participants who indicated English as their preferred language were categorized as having patient-physician language concordance. The language-discordant category included participants who

responded that their regular doctor speaks Spanish/Cantonese “good enough”, “speaks some (sort of)”, “not at all”, or “don't know”.

Patient-physician processes of care—Patient perspectives on communication with their providers in the prior 6 months were assessed using the Interpersonal Processes of Care (IPC) scale comprised of 18 items. The IPC has been validated in multiple languages among ethnically diverse samples [30, 31], and is associated with a range of health outcomes including medication adherence in diabetes [32]. Internal consistency ranges from 0.65 to 0.90 for subscales that measure domains of patient-provider communication, decision making, and interpersonal style [31]. We created an IPC summary score by averaging item responses and converting to a 100-point scale, with higher scores indicating more optimal communication. For analysis of specific communication processes, we included the following subscales hypothesized to affect patient disclosure of using complementary health approaches: providers' clarity of communication, elicitation of patient concerns, explanation of test results and prognosis, shared decision-making approach, and respectful interpersonal style. IPC subscales were created by averaging individual item responses, with a range from 1 to 5.

As an exploratory analysis, we also included *health literacy*, which is associated with quality of patient-provider communication [20, 33] and with diabetes-related outcomes [19]. Prior research suggests that adequate health literacy is associated with use of complementary health approaches among some racial/ethnic groups [34, 35], but to our knowledge health literacy has not been studied in the context of disclosure of complementary health approaches. Health literacy was measured using three brief screening questions previously validated in English and Spanish [36, 37].

2.4. Statistical Analysis

We calculated descriptive statistics, including percentages for use and disclosure of complementary health approaches and other categorical variables and means and standard deviations for continuous variables. We used t-tests and chi-square tests to assess statistically significant differences, defined as $p < 0.05$, between participants who disclosed using complementary health approaches and those who did not. Unadjusted and adjusted odds ratios of disclosing use of complementary health approaches were estimated using logistic regression analyses. For our logistic regression analyses, we tested sociodemographic variables (i.e., age, sex, race/ethnicity, nativity, education, income) with a theoretical basis for affecting disclosure based on prior research findings. In our final models, we included any variable that met a pre-specified level of significance of $p < 0.20$. All analyses were conducted in Stata version 13.1 (College Station, TX).

3. Results

3.1. Sample Characteristics

Of the 278 SMARTSteps study participants who completed a six-month follow-up interview, 133 participants (47.8%) reported using complementary health approaches in the past month. One participant did not respond to the disclosure question and was excluded

from subsequent analyses. Our analytic sample therefore included 132 safety net patients with diabetes that had used **at** least one complementary health approach. Participants had a mean age of 56 years. A majority were women (76.5%), born outside the United States (81.7%), and Asian (54.6%). Just over half of the sample had graduated from high school (52.2%), and nearly two-thirds had an annual household income of less than \$20,000 (62.0%) and preferred to speak Cantonese or Spanish (65.9%); 54.3% reported language concordance with their provider (Table 1).

3.2. Sociodemographic Factors and Disclosure of Using Complementary Health Approaches

Among participants who used complementary health approaches, slightly over half (55.3%) reported disclosing their use to a healthcare provider. Sociodemographic factors, such as age, sex, race/ethnicity, nativity, education level, and household income, were not associated with disclosing use of complementary health approaches in bivariate analyses (Table 1). Average amount spent on complementary health approaches in the past month was higher among nondisclosers than disclosers (\$56 vs. \$38), but this difference was not statistically significant ($p = 0.21$).

3.3. Communication Factors and Disclosure of Using Complementary Health Approaches

In bivariate analysis, language-related factors were associated with disclosure of complementary health approaches (Table 1). Approximately 44% of participants that disclosed using complementary health approaches reported English as their preferred language whereas only 22% of non-disclosers preferred English (overall $p = 0.02$). Similarly, proportionally more participants who disclosed use than those who did not disclose had a language-concordant physician (63.9% vs. 42.1%, $p = 0.02$). Disclosers also had more optimal mean scores on the IPC communication scale (48.2 vs. 43.4, $p < 0.01$, Table 1). While a lower proportion of participants who disclosed using complementary health approaches had limited health literacy compared with those that did not disclose (30.0% vs. 40.0%), this difference was not statistically significant ($p = 0.26$).

3.4. Adjusted Analysis of Disclosure of Using Complementary Health Approaches

Adjusted analysis of disclosure confirmed bivariate findings (Table 2). We tested sociodemographic variables (i.e., age, sex, race/ethnicity, nativity, education, income) and communication factors (health literacy, language concordance, and IPC scale) of interest as predictors of disclosure in logistic regression analyses. To avoid overadjustment, variables that did not meet our pre-specified criterion of $p < 0.20$ were not retained in the final model. Adjusting for age, disclosing use of complementary health approaches was significantly associated with having a language-concordant physician (adjusted odds ratio [AOR]= 2.21, 95% confidence interval [CI]: 1.05, 4.67; $p = 0.04$) and higher IPC communication scores (AOR= 1.50 per 10-unit increase, 95% CI: 1.03, 2.19; $p = 0.03$; Table 2).

3.5. IPC Subscales and Disclosure of Using Complementary Health Approaches

In bivariate analyses of the IPC subscales (Table 3), disclosing use of complementary health approaches was associated with higher patient ratings of physicians explaining results

(unadjusted odds ratio [UOR] = 1.47, 95% CI: 1.04, 2.08; $p = 0.028$) and engaging in shared decision making (UOR = 1.69, 95% CI: 1.31, 2.18; $p < 0.001$). No association was found between disclosure and patient ratings of physicians' communication clarity, elicitation of concerns, or respectful interpersonal style (Table 3). In multivariable analyses adjusting for age, sex, and education, physicians explaining results (AOR = 1.46, 95% CI: 1.03, 2.09; $p < 0.05$) and shared decision making (AOR = 1.74, 95% CI: 1.33, 2.29; $p < 0.001$) remained statistically significant.

3.6. Reasons for Non-Disclosure of Using Complementary Health Approaches

Among participants that did not disclose using complementary health approaches ($n = 59$), we assessed their reasons for non-disclosure (Table 4). The most common reasons for not disclosing were that providers did not ask the patient (57.6%) and patients thinking that providers did not need to know (32.2%) (Table 4). Few participants cited feeling embarrassed or uncomfortable disclosing use of complementary health approaches (1.7%) or providers' lack of time (5.1%) as reasons for not disclosing.

4. Discussion and Conclusion

4.1. Discussion

To date, few studies of complementary health approaches and diabetes have focused on low-income [38], non-English speaking [12, 39], and publicly insured populations, despite the fact that these populations bear a disproportionate burden of diabetes. Low-income and racial/ethnic minorities may particularly benefit from patient-physician communication about complementary health approaches, given the higher prevalence of use among adults with advanced diabetes [3] and its associated financial costs [9]. We assessed the use and disclosure of complementary health approaches among linguistically and racially diverse, low-income patients with diabetes and found that nearly half used complementary health approaches in the prior month and, of those, over half discussed their use with providers. These findings are consistent with prior studies. Nationwide, about one-third of adults with diabetes used complementary health approaches in the past year [3], while estimates of use are as high as 88% among Asians and 96% among African Americans when religion is included as part of the definition [40]. Disclosure of herbal and dietary supplements among individuals with chronic conditions in a national survey range from 37–51% [28]. Our findings were inconsistent with prior research, however, that found that women, those with higher education, and non-Hispanic whites are more likely to disclose their complementary health approaches use [16, 27, 28, 41]. These sociodemographic factors were unrelated to disclosure in our study, perhaps due to less variability in our sample comprised of patients who were mostly foreign-born, with low income and limited education, and due to our modest sample size. Rather, in our sample of safety net patients, language-related factors and patient-physician communication were key predictors of disclosure of complementary health approaches.

Diabetes patients with limited English proficiency face formidable communication barriers leading to suboptimal quality of health care [18, 42]. We found that Cantonese- and Spanish-speaking participants were less likely to disclose their use of complementary health

approaches, suggesting that limited English proficiency affects dialogue about patients' health and treatment preferences. Addressing such communication barriers are critical, given that cultural beliefs about diabetes impact individuals' decisions about medications, traditional remedies, diet and food choices [38, 40, 43, 44]. The effects of providers' language fluency and cultural competence on optimal communication have been previously noted [45, 46]. In our study, patients with a language-concordant physician were considerably more likely to disclose use of complementary health approaches compared with having a language-discordant physician. We did not formally test the mediating effects of language concordance on the association between limited English proficiency and complementary health approaches disclosure because of collinearity between our variables. However, the protective effects of language concordance against the negative impacts of language barriers resulting from limited English proficiency have been documented in the literature [18, 42].

Corroborating findings from previous studies [47], we found that the primary reasons reported for not disclosing use of complementary health approaches were physicians not asking and patients not thinking it was relevant. Clinical reviews of complementary health approaches for diabetes discuss the supporting evidence and potential adverse effects of herbs and supplements and a variety of mind-body practices [6, 48]; and resources providing guidelines for providers about advising patients about complementary health approaches are available [6, 15]. Despite the availability of information, providers may be reluctant to ask their patients about complementary health approaches of which they have limited knowledge [29]. Importantly, in discourse analysis of conversations about complementary health approaches during primary care visits, Koenig and colleagues observed that regardless of providers' knowledge, attitudes and beliefs about complementary health approaches, patient-physician communication can provide patients with a decision-making framework about complementary health approaches, factoring in preferences, risks, and benefits [49].

While we found that overall patient ratings of the quality of communication with their providers were strongly associated with disclosing use of complementary health approaches, not all interpersonal processes of communication were relevant. We found that higher patient ratings of providers' *explanatory*-type communication were associated with disclosure, though surprisingly *elicitation*-type communication was not. In addition, the most relevant communication process appeared to be shared decision making. Use of complementary health approaches is prevalent among patients with diabetes and occurs in the context of other health behaviors. Engaging with patients about their treatment preferences, including use of complementary health approaches, is part of patient-centered care to support diabetes self-management, monitor patient safety, and minimize risk. Our findings highlight the relevance of communication processes and strategies that providers can employ to support patients' treatment decision making even without specific content knowledge about complementary health approaches.

This study was conducted among low-income patients with diabetes who sought care at publicly-funded clinics, which may limit the generalizability of our study findings beyond this important subgroup of diabetes patients. Definitions of complementary health approaches are inconsistent across studies and the inclusion or exclusion of certain practices

affects estimates of usage prevalence. For instance, by some definitions, vitamins or nutritional supplements may not be considered part of complementary health approaches. We opted to include these approaches to maintain consistency with categories used by the National Center for Complementary and Integrative Health. In addition, attitudes and beliefs about complementary health approaches vary by geography, with the US West having the highest rates of use [50]. Our study was based in San Francisco, and disclosure may be higher than in regions where complementary health approaches is less common or less accepted. Additionally, our study participants were asked about their use and disclosure of complementary health approaches in the prior month. Within this relatively short time frame, the subset of participants who may have only just begun to use complementary health approaches likely had limited opportunities to communicate with providers, resulting in an underestimation of disclosure in our study. Finally, our study used survey-based quantitative data; qualitative data are needed for a richer understanding of when and why patients' choose to discuss complementary health approaches with their providers. Nearly one-fifth of participants that did not disclose use of complementary health approaches cited 'other reason' for non-disclosure, but these additional reasons were not collected in our study.

4.2. Conclusion

Although use of complementary health approaches is common among diverse, safety net patients with diabetes, disclosure is inconsistent. Prior research suggests particularly low rates of disclosure of complementary health practices among racial/ethnic minorities and those of limited English proficiency. We identified specific novel factors, such as patient-physician language concordance and shared decision making that may facilitate disclosure and guide patients and providers in navigating discussions regarding the appropriate use of complementary health approaches in the context of diabetes management.

4.3. Practice Implications

Providers should be aware that use of complementary health approaches is common among racially, linguistically diverse patients with diabetes. Open dialogue about use of complementary health approaches can be supported by providers pro-actively asking patients about these practices in the context of diabetes self-management. Engaging in shared decision-making and explanatory-type communication facilitate discussions about complementary health approaches during the medical encounter. Availability of language-concordant providers can reduce barriers for patients with limited English proficiency to communicate about health-related decisions and trade-offs between complementary health practices, medications, diet and food choices.

Acknowledgments

Sources of Funding: This study was funded by the Agency for Healthcare Research and Quality grants R18HS017261 and R03HS020684; Centers for Disease Control and Prevention grant 5U58DP002007-03; the Health Delivery Systems Center for Diabetes Translational Research (CDTR) through NIDDK grant 1P30-DK092924; the UCSF Collaborative Research Network funded through NIH grant UL1 RR024131, the National Center for Complementary and Integrative Health grant K01AT006545, and the National Center for Advancing Translational Sciences (KL2TR00143). The funding sources had no role or involvement in the design and conduct of the study; the collection, management, analysis, or interpretation of the data; or in the preparation, review, or approval of the manuscript.

References

- [1]. National Center for Complementary and Integrative Health. Complementary, Alternative, or Integrative Health: What's In a Name?. Downloaded from (<https://nccih.nih.gov/health/whatisacam>) (on 28th February 2015)
- [2]. Garrow D, Egede LE. National patterns and correlates of complementary and alternative medicine use in adults with diabetes. *J Altern Complement Med*. 2006; 12:895–902. [PubMed: 17109581]
- [3]. Nahin RL, Byrd-Clark D, Stussman BJ, Kalyanaraman N. Disease severity is associated with the use of complementary medicine to treat or manage type-2 diabetes: data from the 2002 and 2007 National Health Interview Survey. *BMC Complement Altern Med*. 2012; 12:193. [PubMed: 23088705]
- [4]. Yeh G, Eisenberg DM, Davis RB, Phillips RS. Use of complementary and alternative medicine among persons with diabetes mellitus: results of a national survey. *Am J Public Health*. 2002; 92:1648–52. [PubMed: 12356615]
- [5]. Kanaya AM, Araneta MR, Pawlowsky SB, Barrett-Connor E, Grady D, Vittinghoff E, Schembri M, Chang A, Carrion-Petersen ML, Coggins T, Tanori D, Armas JM, Cole RJ. Restorative yoga and metabolic risk factors: the Practicing Restorative Yoga vs. Stretching for the Metabolic Syndrome (PRYSMS) randomized trial. *J Diabetes Complications*. 2014; 28:406–12. [PubMed: 24418351]
- [6]. Birdee GS, Yeh G. Complementary and alternative medicine therapies for diabetes: A clinical review. *Clinical Diabetes*. 2010; 28:147–55.
- [7]. Song R, Ahn S, Roberts BL, Lee EO, Ahn YH. Adhering to a t'ai chi program to improve glucose control and quality of life for individuals with type 2 diabetes. *J Altern Complement Med*. 2009; 15:627–32. [PubMed: 19500007]
- [8]. van Son J, Nyklicek I, Pop VJ, Blonk MC, Erdtsieck RJ, Spooren PF, Toorians AW, Pouwer F. The effects of a mindfulness-based intervention on emotional distress, quality of life, and HbA(1c) in outpatients with diabetes (DiaMind): a randomized controlled trial. *Diabetes Care*. 2013; 36:823–30. [PubMed: 23193218]
- [9]. Nahin RL, Barnes PM, Stussman BJ, Bloom B. Costs of complementary and alternative medicine (CAM) and frequency of visits to CAM practitioners: United States, 2007. *Natl Health Stat Report*. 2009:1–14. [PubMed: 19771719]
- [10]. Handley, M.; Chao, MT.; Quan, J.; Sarkar, U.; Ratanawongsa, N.; Soria, C., et al. Complementary and alternative medicine (CAM) use and its disclosure to providers among ethnically diverse safety net patients with diabetes in San Francisco. 141st annual meeting of the American Public Health Association; Boston, MA. 2013.
- [11]. Pagan JA, Tanguma J. Health care affordability and complementary and alternative medicine utilization by adults with diabetes. *Diabetes Care*. 2007; 30:2030–1. [PubMed: 17519426]
- [12]. Ahn AC, Ngo-Metzger Q, Legedza ATR, Massagli MP, Clarridge BR, Phillips RS. Complementary and alternative medical therapy use among Chinese and Vietnamese Americans: Prevalence, associated factors, and effects of patient-clinician communication. *Am J Public Health*. 2006; 96:647–53. [PubMed: 16380575]
- [13]. Roberts CS, Baker F, Hann D, Runfola J, Witt C, McDonald J, Livingston ML, Ruiterman J, Ampela R, Kaw OC, Blanchard C. Patient-physician communication regarding use of complementary therapies during cancer treatment. *J Psychosoc Oncol*. 2005; 23:35–60. [PubMed: 16618687]
- [14]. American Diabetes Association. Unproven therapies. *Diabetes Care*. 2004; 27(Suppl 1):S135. [PubMed: 14693951]
- [15]. National Center for Complementary and Integrative Health. Time to talk. Downloaded from (<https://nccih.nih.gov/timetotalk>) (on 28th February 2015)
- [16]. Chao MT, Wade C, Kronenberg F. Disclosure of complementary and alternative medicine to conventional medical providers: variation by race/ethnicity and type of CAM. *J Natl Med Assoc*. 2008; 100:1341–9. [PubMed: 19024232]
- [17]. Schenker Y, Karter AJ, Schillinger D, Warton EM, Adler NE, Moffet HH, Ahmed AT, Fernandez A. The impact of limited English proficiency and physician language concordance on

- reports of clinical interactions among patients with diabetes: the DISTANCE study. *Patient Educ Couns.* 2010; 81:222–8. [PubMed: 20223615]
- [18]. Fernandez A, Schillinger D, Warton EM, Adler N, Moffet HH, Schenker Y, Salgado MV, Ahmed A, Karter AJ. Language barriers, physician-patient language concordance, and glycemic control among insured Latinos with diabetes: the Diabetes Study of Northern California (DISTANCE). *J Gen Intern Med.* 2011; 26:170–6. [PubMed: 20878497]
- [19]. Schillinger D, Grumbach K, Piette J, Wang F, Osmond D, Daher C, Palacios J, Sullivan GD, Bindman AB. Association of health literacy with diabetes outcomes. *J Amer Med Assoc.* 2002; 288:475–82.
- [20]. Schillinger D, Bindman A, Wang F, Stewart A, Piette J. Functional health literacy and the quality of physician-patient communication among diabetes patients. *Patient Educ Couns.* 2004; 52:315–23. [PubMed: 14998602]
- [21]. Piette JD, Schillinger D, Potter MB, Heisler M. Dimensions of patient-provider communication and diabetes self-care in an ethnically diverse population. *J Gen Intern Med.* 2003; 18:624–33. [PubMed: 12911644]
- [22]. Fisher L, Skaff MM, Chesla CA, Chun KM, Mullan JT, Kanter RA, Gardiner PS. Disease management advice provided to African-American and Chinese-American patients with type 2 diabetes. *Diabetes Care.* 2004; 27:2249–50. [PubMed: 15333495]
- [23]. Holman H, Lorig K. Patient self-management: a key to effectiveness and efficiency in care of chronic disease. *Public Health Rep.* 2004; 119:239–43. [PubMed: 15158102]
- [24]. Ratanawongsa N, Handley MA, Quan J, Sarkar U, Pfeifer K, Soria C, Schillinger D. Quasi-experimental trial of diabetes Self-Management Automated and Real-Time Telephonic Support (SMARTSteps) in a Medicaid managed care plan: study protocol. *BMC Health Serv Res.* 2012; 12:22. [PubMed: 22280514]
- [25]. Ratanawongsa N, Handley MA, Sarkar U, Quan J, Pfeifer K, Soria C, Schillinger D. Diabetes health information technology innovation to improve quality of life for health plan members in urban safety net. *J Ambul Care Manage.* 2014; 37:127–37. [PubMed: 24594561]
- [26]. Kronenberg F, Cushman LF, Wade CM, Kalmuss D, Chao MT. Race/ethnicity and women's use of complementary and alternative medicine in the United States: results of a national survey. *Am J Public Health.* 2006; 96:1236–42. [PubMed: 16735632]
- [27]. Arcury TA, Bell RA, Altizer KP, Grzywacz JG, Sandberg JC, Quandt SA. Attitudes of Older Adults Regarding Disclosure of Complementary Therapy Use to Conventional Physicians. *J Appl Gerontol.* 2013; 32:627–45. [PubMed: 24991082]
- [28]. Mehta DH, Gardiner PM, Phillips RS, McCarthy EP. Herbal and dietary supplement disclosure to health care providers by individuals with chronic conditions. *J Altern Complement Med.* 2008; 14:1263–9. [PubMed: 19032071]
- [29]. Zhang Y, Peck K, Spalding M, Jones BG, Cook RL. Discrepancy between patients' use of and health providers' familiarity with CAM. *Patient Educ Couns.* 2012; 89:399–404. [PubMed: 22465482]
- [30]. Schillinger D, Handley M, Wang F, Hammer H. Effects of self-management support on structure, process, and outcomes among vulnerable patients with diabetes: a three-arm practical clinical trial. *Diabetes Care.* 2009; 32:559–66. [PubMed: 19131469]
- [31]. Stewart AL, Napoles-Springer AM, Gregorich SE, Santoyo-Olsson J. Interpersonal processes of care survey: patient-reported measures for diverse groups. *Health Serv Res.* 2007; 42:1235–56. [PubMed: 17489912]
- [32]. Ratanawongsa N, Karter AJ, Parker MM, Lyles CR, Heisler M, Moffet HH, Adler N, Warton EM, Schillinger D. Communication and medication refill adherence: the Diabetes Study of Northern California. *JAMA Intern Med.* 2013; 173:210–8. [PubMed: 23277199]
- [33]. Schillinger D, Piette J, Grumbach K, Wang F, Wilson C, Daher C, Leong-Grotz K, Castro C, Bindman AB. Closing the loop: physician communication with diabetic patients who have low health literacy. *Arch Intern Med.* 2003; 163:83–90. [PubMed: 12523921]
- [34]. Bains SS, Egede LE. Association of health literacy with complementary and alternative medicine use: a cross-sectional study in adult primary care patients. *BMC Complement Altern Med.* 2011; 11:138. [PubMed: 22208873]

- [35]. Gardiner P, Mitchell S, Filippelli AC, Sadikova E, White LF, Paasche-Orlow MK, Jack BW. Health literacy and complementary and alternative medicine use among underserved inpatients in a safety net hospital. *J Health Commun.* 2013; 18(Suppl 1):290–7. [PubMed: 24093362]
- [36]. Chew LD, Griffin JM, Partin MR, Noorbaloochi S, Grill JP, Snyder A, Bradley KA, Nugent SM, Baines AD, Vanryn M. Validation of screening questions for limited health literacy in a large VA outpatient population. *J Gen Intern Med.* 2008; 23:561–6. [PubMed: 18335281]
- [37]. Sarkar U, Schillinger D, Lopez A, Sudore R. Validation of self-reported health literacy questions among diverse English and Spanish-speaking populations. *J Gen Intern Med.* 2011; 26:265–71. [PubMed: 21057882]
- [38]. Arcury TA, Bell RA, Snively BM, Smith SL, Skelly AH, Wetmore LK, Quandt SA. Complementary and alternative medicine use as health self-management: rural older adults with diabetes. *J Gerontol B Psychol Sci Soc Sci.* 2006; 61:S62–70. [PubMed: 16497962]
- [39]. Nguyen H, Sorkin DH, Billimek J, Kaplan SH, Greenfield S, Ngo-Metzger Q. Complementary and alternative medicine (CAM) use among non-Hispanic white, Mexican American, and Vietnamese American patients with type 2 diabetes. *J Health Care Poor Underserved.* 2014; 25:1941–55. [PubMed: 25418251]
- [40]. Villa-Caballero L, Morello CM, Chynoweth ME, Prieto-Rosinol A, Polonsky WH, Palinkas LA, Edelman SV. Ethnic differences in complementary and alternative medicine use among patients with diabetes. *Complement Ther Med.* 2010; 18:241–8. [PubMed: 21130360]
- [41]. Wallen GR, Brooks AT. To Tell or Not to Tell: Shared Decision Making, CAM Use and Disclosure Among Underserved Patients with Rheumatic Diseases. *Integr Med Insights.* 2012; 7:15–22. [PubMed: 23071389]
- [42]. Ngo-Metzger Q, Sorkin DH, Phillips RS, Greenfield S, Massagli MP, Clarridge B, Kaplan SH. Providing high-quality care for limited English proficient patients: the importance of language concordance and interpreter use. *J Gen Intern Med.* 2007; 22(Suppl 2):324–30. [PubMed: 17957419]
- [43]. Chun KM, Chesla CA. Cultural issues in disease management for chinese americans with type 2 diabetes. *Psychology & Health.* 2004; 19:767–85.
- [44]. Lipton RB, Losey LM, Giachello A, Mendez J, Girotti MH. Attitudes and issues in treating Latino patients with type 2 diabetes: views of healthcare providers. *Diabetes Educ.* 1998; 24:67–71. [PubMed: 9526327]
- [45]. Fernandez A, Schillinger D, Grumbach K, Rosenthal A, Stewart AL, Wang F, Perez-Stable EJ. Physician language ability and cultural competence. An exploratory study of communication with Spanish-speaking patients. *J Gen Intern Med.* 2004; 19:167–74. [PubMed: 15009796]
- [46]. Lopez-Quintero C, Berry EM, Neumark Y. Limited English proficiency is a barrier to receipt of advice about physical activity and diet among Hispanics with chronic diseases in the United States. *J Am Diet Assoc.* 2009; 109:1769–74. [PubMed: 19782177]
- [47]. Robinson A, McGrail MR. Disclosure of CAM use to medical practitioners: a review of qualitative and quantitative studies. *Complement Ther Med.* 2004; 12:90–8. [PubMed: 15561518]
- [48]. DiNardo MM, Gibson JM, Siminerio L, Morell AR, Lee ES. Complementary and alternative medicine in diabetes care. *Curr Diab Rep.* 2012; 12:749–61. [PubMed: 22986889]
- [49]. Koenig CJ, Ho EY, Yadegar V, Tarn DM. Negotiating complementary and alternative medicine use in primary care visits with older patients. *Patient Educ Couns.* 2012; 89:368–73. [PubMed: 22483672]
- [50]. Barnes, PM.; Bloom, B.; Nahin, RL. National health statistics reports; no 12. 2008. Complementary and alternative medicine use among adults and children: United States, 2007.

Table 1

Characteristics of SMARTSteps participants who used complementary health approaches by disclosure status

Characteristic	All complementary health approach users (N=132) N (%) or mean \pm SD	Disclosed use of complementary health approaches (n=73) N (%) or mean \pm SD	Did not disclose use of complementary health approaches (n=59) N (%) or mean \pm SD	p-value
Sociodemographic Characteristics				
Age, years	55.7 \pm 8.7	55.9 \pm 9.6	55.5 \pm 7.6	0.77
Women	101 (76.5)	59 (80.8)	42 (71.2)	0.22
Race/ethnicity				0.42
Asian/Pacific Islander	72 (54.6)	36 (49.3)	36 (61.0)	
Latino	35 (26.5)	21 (28.8)	14 (23.7)	
Black, White, or Other	25 (18.9)	16 (21.9)	9 (15.3)	
Nativity, ^a Born outside the U.S.	94 (81.7)	47 (78.3)	47 (85.5)	0.35
Educational attainment, ^a high school graduate	60 (52.2)	35 (58.3)	25 (45.5)	0.17
Annual household income, ^a \$20,000	67 (62.6)	38 (69.1)	29 (55.8)	0.16
Amount spent on complementary practices in past month, \$	46.6 \pm 121.3	38.7 \pm 63.8	55.9 \pm 164.7	0.21
Health Communication Factors				
Limited health literacy ^a	40 (34.8)	18 (30.0)	22 (40.0)	0.26
Language				0.02
Cantonese-speaking	59 (44.7)	26 (35.6)	33 (55.9)	
Spanish-speaking	28 (21.2)	15 (20.6)	13 (22.0)	
English-speaking	45 (34.1)	32 (43.8)	13 (22.0)	
Language-concordant primary care provider ^a	70 (54.3)	46 (63.9)	24 (42.1)	0.02
Interpersonal Processes of Care ^b	46.1 \pm 10.6	48.2 \pm 10.5	43.4 \pm 10.2	<0.01

Note: SMARTSteps = Self-Management Automated and Real-Time Telephonic Support

^aMissing data: nativity = 17, education = 17, household income = 25, health literacy = 17, language concordance = 3

^bHigher score indicates more optimal quality of communication

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

Table 2

Unadjusted and adjusted odds ratios of disclosing use of complementary health approaches for sociodemographic characteristics and health communication factors

	Unadjusted Odds Ratio (95% CI)	Adjusted Odds Ratio (95% CI)
Sociodemographic Characteristics		
Age	1.01 (0.97, 1.05)	1.03 (0.99, 1.08)
Women	1.71 (0.76, 3.84)	
Race/ethnicity		
Asian/Pacific Islander	0.56 (0.22, 1.44)	
Latino	0.84 (0.29, 2.44)	
Black, White, or Other	1.00	
Nativity, Born outside the U.S.	1.63 (0.62, 4.28)	
Educational attainment, high school graduate	1.68 (0.80, 3.52)	
Annual household income, \$20,000)	1.77 (0.80, 3.91)	
Health Communication Factors		
Limited health literacy	0.64 (0.30, 1.39)	
Language-concordant primary care provider	2.37 (1.15, 4.89) *	2.21 (1.05, 4.67) *
Interpersonal Processes of Care ^a	1.56 (1.10, 2.20) *	1.50 (1.03, 2.19) *

Note: CI = confidence interval

* $p < 0.05$

^a 10-unit increase

Table 3

Interpersonal Processes of Care (IPC) subscales by disclosure status

IPC Subscale	Disclosed use of complementary health approaches ^a mean ± SD	Did not disclose use of complementary health approaches ^a mean ± SD	Unadjusted odds ratio (95% CI)	Adjusted odds ratio (95% CI) ^b
Clarity of communication	4.59 ± 0.65	4.44 ± 0.86	1.30 (0.82, 2.07)	1.37 (0.84, 2.22)
Elicitation of patient concerns	4.20 ± 1.04	3.99 ± 1.09	1.20 (0.87, 1.66)	1.19 (0.85, 1.67)
Explanation of test results and prognosis	4.60 ± 0.86	4.17 ± 1.25	1.47 (1.04, 2.08) *	1.46 (1.03, 2.09) *
Shared decision-making approach	3.51 ± 1.37	2.42 ± 1.45	1.69 (1.31, 2.18) **	1.74 (1.33, 2.29) **
Respectful interpersonal style	4.50 ± 0.86	4.53 ± 0.74	1.04 (0.68, 1.61)	1.07 (0.68, 2.50)

Note: IPC = Interpersonal Processes of Care, CI = confidence interval

^a Higher scores indicate more optimal quality of communication.

^b Models adjusted for age, sex, and education

* p < 0.05

** p < 0.001

Table 4

Reasons for not disclosing use of complementary health approaches, n = 59

Reason^a	N (%)
No one asked	32 (54.2%)
Didn't think they would need to know	19 (32.2%)
Didn't think they would want to know	3 (5.1%)
Didn't think they had the time	3 (5.1%)
Felt uncomfortable/ embarrassed/ guilty telling them	1 (1.7%)
Were worried they would be upset with patient	1 (1.7%)
Other reason (not specified)	11 (18.6%)

^aParticipants could check more than one reason for not disclosing use of complementary health approaches; percents do not total to 100.

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript