Use of Traditional Chinese Medicine by older Chinese immigrants in Canada

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Background. Research is needed about the usage of complementary and alternative medicines within culturally diverse groups because of a growing number of people who use these remedies.

Objective. To understand the prevalence and predictors of Traditional Chinese Medicine (TCM) use by older Chinese immigrants in Canada.

Methods. This is based on the data collected from a representative sample of 2167 elderly Chinese immigrants aged 55 years and above in seven Canadian cities. Logistic regression was used to estimate the probability of using TCM in combination with Western health services (WHS). Use of Chinese herbs, herbal formulas, and TCM practitioners (herbalists) was predicted, based upon the effects of predisposing, enabling and need factors.

Results. The response rate was 77%. Over two-thirds of the older Chinese immigrants reported using TCM in combination with WHS. About half (50.3%) of the older Chinese immigrants used Chinese herbs, 48.7% used Chinese herbal formulas, and 23.8% consulted a Chinese herbalist. Although separate analysis was conducted, similar predictors were identified. Country of origin, Chinese health beliefs, social support, city of residency, and health variables were the common predictors of using a form of TCM.

Conclusion. The combined use of TCM and WHS is common among elderly Chinese immigrants. Culture-related variables are important in determining use of TCM. The predictors identified should help physicians to recognize who among the elderly Chinese immigrants are more likely to use TCM so that a more in-depth understanding toward their health practices and needs can be achieved.

Keywords. Chinese, health services, immigrants, service utilization, traditional Chinese medicine.

Introduction

Although more and more people in Canada use traditional, alternative, or complementary medicines,[1] research on health practices of culturally diverse groups is lacking. It is particularly the case for research on the aging population in culturally diverse groups.

Studies on the aging population have focused primarily on techniques providing relief for aging related ailments, including Parkinson's disease, pneumonia and sleep quality.[2–4] Predictors for older persons' using Complementary Alternative Medicine (CAM) include more socioeconomic resources and health needs, younger age, higher education, having arthritis, being depressed, having high anxiety, being non-hypertensive, amount of exercise, practicing meditation and visiting physicians frequently.[5] For older persons with chronic conditions, CAM use decrease with higher age and more prescription drug use, and increase with more co-morbid conditions and reading about diagnosed illnesses.[6]

As the largest visible minority group in Canada, the Chinese report the highest proportion of elderly persons compared to other visible minority groups. Although there may be a common belief that many older Chinese use Traditional Chinese Medicine

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(TCM) due to their culture, intra-group sociocultural diversity and traditional beliefs, variations in acculturation levels complicate this topic. Therefore, it is the researchers' intention to further understand the reality of TCM use within this ethnic minority immigrant population.

Forty-one percent of Chinese-Americans use different types of home medication.[7] Elderly Chinese-Canadians in another study believed TCM use is beneficial; 28.3% used TCM and an additional 21.7% combined TCM and western medicines.[8] More pain symptoms, hospitalization and moderate to strong belief in TCM determine use among elderly Chinese-Canadians.[8] Another study revealed that 50% of Chinese-Canadian elderly utilized TCM, with the strongest predictors being religious beliefs and TCM preference.[9] While both studies[8,9] provided basic findings on TCM use, small and localized samples limited generalization.

As the cultural diversity within the aging population grows, health practitioners need to understand issues related to TCM use. It was the objective of this study to understand what types of TCM were being used by aging Chinese immigrants in Canada as well as the predictors for using TCM within this immigrant population. To fulfill this research objective, this study used the Andersen and Newman service utilization model[10] to form its theoretical base. The model posits that predisposing, enabling and need factors predict service use. Predisposing factors are antecedent to the onset of health problems. Enabling factors are conditions that impede or facilitate the use of health service.[10] Need factors are health or psychosocial problems that lead to health services utilization. Older persons with more health and psychosocial problems have reported higher service use in previous studies.[11–15]

Methods

Very few research studies with a national scope have addressed health and service utilization of the aging Chinese in Canada. Findings available on aging Chinese have always been very limited in Canadian national studies, due to the lack of oversampling for ethnocultural minority groups. For example, the Canadian Community Health Survey 2.1 (CCHS) by Statistics Canada is one of the largest surveys on health and well being of the Canadian population, with a total sample size of over 134 072. However, the sample size of Chinese in the CCHS 2.1 was small and underrepresented, with only 2387 or 1.76% of the total sample of 135 573. According to the 2001 Census, 1 029 395 or 3.4% of the 30 007 094 Canadians reported Chinese as their ethnic origin. In the CCHS 2.1, only 455 Chinese participants were 55 years of age or older. This sample size is too small to be generalized to a larger aging Chinese population in Canada.

Language issue is another problem with national surveys, as they usually include mainly participants who are able to speak the official languages, while those who do not are more likely to be excluded. For example, according to personal communication with Statistics Canada officials, 8% cases were excluded from the CCHS 2.1 due to language problems. Since no systematic attempt was made to document the languages used by the excluded cases, the ability of the CCHS data to represent ethnocultural minority groups is questionable. Finally, national health studies such as the CCHS 2.1 did not examine variables on cultural values or beliefs of the aging Chinese. The applicability of the data for examining how cultural factors may have affected service use and health status is limited. These issues and limitations further justify the need to conduct separate health studies on ethnocultural minority groups. Therefore, in this study, data obtained from a large random sample of older Chinese in Canada were used for the analysis.

The data for this study were collected between summer 2001 and spring 2002 from a research project—'Health and Well Being of Older Chinese in Canada,' which examined the health and culture of older Chinese aged 55 years and above in the seven Canadian cities of Victoria, Greater Vancouver, Calgary, Edmonton, Winnipeg, Greater Toronto and Greater Montreal.[16] The total Chinese population in these seven cities accounts for 89% of the entire Chinese-Canadian population in Canada.[17] The sample was randomly selected through telephone contact with Chinese households identified by Chinese surnames listed in local telephone directories. The authors of this study were aware of the limitations of using the telephone directory and Chinese surnames as the sample selection method. Older Chinese who do not own a telephone, those who may not be using a traditional Chinese surname and who may have kept their telephone number unlisted, were probably excluded from this study. However, support for using surnames as the identification key for locating Chinese and other Asian participants has also been well established in previous studies.[18–25]

For this study, the sampling frame was formed by identifying Chinese surnames from telephone directories in each site. Chinese surnames published in previous surname analysis studies,[18–24] and surnames published in local Chinese telephone directories in each site were used to form the search list. Additional Chinese surnames were also identified by searching the 'Hundred Family Surnames' on the Internet (e.g. http://www.geocities.com/chinesesurname/). Using the Chinese surnames identified, the local telephone directories of each of the data collection sites were thoroughly screened. Thus, from the local telephone

directories, 297 064 Chinese surname listings were identified. A serial number was assigned to each of the telephone listings identified for each site. Using the SPSS Version 11 random cases selection function, a subsample of telephone numbers was randomly selected, based upon the size of the Chinese-Canadian population and the estimated proportion of the population aged 55 years and older in each site. As a result, a random sample of 40 654 telephone numbers listed under 876 Chinese surnames were randomly selected.

Telephone screeners who were proficient in English and at least one of the major Chinese dialects, such as Cantonese, Mandarin and Toishanese, were recruited and trained to conduct telephone screening by calling all the randomly selected telephone numbers to identify eligible participants. To be eligible, one had to identify himself or herself as an ethnic Chinese aged 55 years or older. Eligible participants that were identified were invited to take part in a face-to-face interview that took place either at the participant's home or at one of the community organizations, which collaborated with the research project at the local site. For households with more than one eligible participant, only one was randomly selected using a roll-the-dice method. The interviews were conducted by bilingual interviewers either in English or a Chinese dialect spoken by the participants. As a result, a total of 21 640 randomly selected telephone numbers were successfully contacted. Among them, 12 621 (58.3%) were verified to be Chinese households; and 9019 were non-Chinese. From the identified Chinese households, a total of 2949 eligible participants were successfully identified and a total of 2272 of them completed the face-to-face interview in the original study, representing a response rate of 77%. Among the interviews completed, 2.1% were conducted in English, 83.6% in Cantonese, 9.3% in Mandarin, 4.4% in Toishanese and 0.6% in other Chinese dialects. Of the 2272 participants, 2214 were first generation immigrants who migrated from other countries or places. Since the sample size of the Canadian-born Chinese in this sample is too small to allow any meaningful comparison, the study focused only on the immigrant sample.

Measures
The use of TCM was measured by a checklist asking participants to identify types of TCM used within the past year. TCM included seeing a Chinese herbalist, consulting a bone-setter, using moxibustion, using acupuncture, consulting a Qi Qong specialist, using over-the-counter Chinese herbs and using over-the-counter Chinese herbal formulas. A score of one was assigned to a positive answer; and the total scores ranged from 0 (not using TCM) to 7 (highest TCM use). In the study, use of WHS was also measured using a list of 21 WHS such as family physician,

emergency department, hospital care and medical laboratory services. Based upon answers provided, participants were categorized into four groups: used only WHS, used both TCM and WHS, used only TCM and used neither TCM nor WHS. The dependent variable was then binary coded (1 = used both WHS and TCM, 0 = used solely WHS). In addition, the use of each of the seven types of TCM was binary coded (1 = used, 0 = not used) as separate dependent variables.

Since a very small number of participants reported using only TCM (n = 22) and a small number reported using neither TCM nor WHS (n = 25), results obtained by making comparison with these two groups are likely to be erroneous. Therefore, these 47 cases were excluded from the analysis, resulting in a final sample size for this study of 2167.

Three independent variable types, based upon the Andersen–Newman service utilization model[10] were tested in this study. Predisposing factors included age, gender, marital status, religion, education, country of origin, length of residency in Canada, Chinese health beliefs and Chinese cultural values. Age was measured by chronological age. Gender was grouped as male or female. Marital status was grouped into married/common-law and not married. Religion was grouped into having a religion or not having a religion. Education level was grouped into 'formal education', 'primary', 'secondary', and 'post-secondary'. Place of origin was measured by asking about the place where the participant migrated from. Length of residency was measured by number of years lived in Canada.

Chinese health beliefs refer to the conceptual views, beliefs and attitudes toward various health concepts in Chinese culture. As no existing standardized scale was available, one was constructed by the research team of the original study, based on previous literature[26–28] on Chinese health beliefs and norms. Two independent TCM practitioners were also consulted before finalizing the questions for the scale developed for measuring Chinese health beliefs in this study. As a result, a Chinese health belief scale, with 12 statements measuring one's levels of agreement with health beliefs related to healthy eating habits, health maintenance and use of TCM, was developed. Participants were asked to indicate their level of agreement with each statement as (1) disagree, (2) neither agree nor disagree or (3) agree. Responses from the 12 statements were summed and averaged to form a score ranging between 1 and 3, with a higher score representing higher agreement with Chinese health beliefs. Although previous research has indicated that people using TCM are the ones who are more receptive toward this type of medicine,[29] the scale developed for this study did not just measure the use of TCM, but also the levels of agreement toward the broader

view of traditional Chinese health beliefs and practices. A Cronbach's alpha of 0.80 was reported.

Chinese cultural values referred to traditional Chinese cultural beliefs and values toward language use, gender role, interracial marriage, food and diet and parent-child relationships. They were measured by a list of 11 statements along a five-point scale, ranging from strongly disagree (1) to strongly agree (5), with higher scores indicating a higher level of identification with Chinese cultural values. These items were constructed by the research team of the original research study, based on previous literature on typical Chinese cultural values,[30–35] and input from community research partners who are experts in working with various Chinese communities in Canada. In this study, a Cronbach's alpha of 0.82 was reported. Health beliefs and cultural values were included as predictors since these variables represented the 'culture' of this population. There was a significant but very mild correlation (Pearson r = 0.32) between the variables on Chinese culture and Chinese health beliefs, indicating that these variables could be conceptually related and capturing different aspects of the Chinese culture, but not having a major multicollinearity problem.

Enabling factors included social support, self-rated financial adequacy, personal monthly income, self-rated English competency, living arrangement, service barriers and city of residency. Five questions, adopted from the Older Americans Resources and Services (OARS) Social Resource Scale,[36] were used to measure social support. These five questions assessed participants' frequency of interaction with friends and relatives through talking on the phone, frequency of visitation from others, availability of a confidant and availability of someone to help if one were sick or disabled. Due to the different scoring range for each item, the item scores were transformed to *Z*-scores. The final score was formed by summing the *Z*-scores for each item, with a higher total score representing a higher level of social support. Using the five items to form the scale, a Cronbach's alpha of 0.64 was reported. Removing the item measuring the availability of help if one were sick or disabled would improve the Cronbach's alpha to 0.71. The 'hypothetical nature' of the removed item is probably the reason for its lack of internal consistency with other items in the scale. Therefore, the final social support scores were made up of only the four remaining items, with the final score ranged between the *Z*-scores of –5.91 and 5.80, with a mean of zero (SD = 2.93).

Self-rated financial adequacy using a four-point scale ranging between 'very well' (4) to 'very inadequate' (1) measured the extent income and investment satisfied needs. Personal monthly income levels were grouped into '<\$500,' '\$500–999,' '\$1000–1499,' and '\$1500 and above.' Self-rated English competency was assessed using two questions asking levels of English comprehension and speech. A higher final score, ranging between 2 and 6, represented a better level of English competency. Living arrangements were grouped as either 'living alone' or 'living with someone.' Service barriers were identified from a list of 21 potential barriers to health services adapted from previous research.[37] City of residency referred to the city in which participants reside.

Need factors are usually represented by health-related variables in health services research. In this study, physical health and mental health were the two variables representing the need factors. These two variables were measured by the Medical Outcomes Study 36-item Short Form (SF-36),[38] a widely used standardized scale for assessing physical and general health status. This scale has also been adapted and translated into Chinese to fit the Chinese cultural context for Chinese respondents. Psychometric evaluation confirms the reliability and validity of the instrument.[39,40] This 36-item scale yielded scores for two dimensions, PCS (Physical Component Summary) and MCS (Mental Component Summary), representing the physical and mental health, with higher scores meaning better health status. When used with the older Chinese in this study, a Cronbach's alpha of 0.90 was reported for the PCS and 0.85 for the MCS.

Data analysis
Logistic regression was used to estimate the effects of the predicting variables on the probability of combined TCM-WHS use, while statistically controlling for other confounding factors. Separate analysis was conducted for each major TCM used. The correlation coefficients among all the predictors were examined and no evidence of multicollinearity was reported. Due to the large sample size and the skewed distribution of the dependent variables, which may be very sensitive to statistical tests of significance, the cut off *P*-value was adjusted to a more conservative statistical significance level. A predictor was considered significant when the *P*-value is smaller than 0.001 (2-tailed). Previous research findings have indicated that social support is significantly related to health status.[41] Therefore in this study, the effects of two interaction terms between social support and physical health as well as mental health were created, and added to each logistic regression analysis as an additional block.

Results

Descriptive statistics for the dependent and independent variables of this study are presented in Table 1. The mean age of the participants was 69.8 (SD = 8.7). Over half (56.5%) of them were female. Over one-third (42.3%) of the participants indicated not having

TABLE 1.   *Demographics of the participants (N = 2167)*

Predisposing factors	
Age (in yrs), mean (SD)	69.8 (8.7)
Gender (%)	
Female	56.5
Male	43.5
Marital status (%)	
Single	34.1
Married	65.9
Religion (%)	
Not indicating a religion	42.3
Having a Western religion	26.7
Having a non-Western religion	31.0
Education (%)	
No formal education	12.9
Elementary	28.9
Secondary	37.7
Post-secondary and above	20.5
Country of origin (%)	
Mainland China	27.2
Hong Kong	52.1
Others[a]	20.6
Length of residency (in years), mean (SD)	18.3 (12.0)
Chinese health beliefs, mean (SD) (Range: 1–3)	2.5 (0.4)
Chinese cultural values, mean (SD) (Range: 1–5)	3.7 (0.6)
Enabling factors	
Living arrangement (%)	
Not living alone	86.3
Living alone	13.7
Social support, mean (SD) (Range: –0.59–0.58)	0 (2.9)
Personal monthly income	
Less than $500	16.2
$500–$999	38.6
$1000–$1499	34.2
$1500 and above	11.0
Self-rated financial adequacy, mean (SD) (Range: 1–4)	2.8 (0.6)
Self-rated English competency, mean (SD) (Range: 2–6)	4.1 (0.3)
Service barriers, mean (SD) (Range: 0–21)	4.8 (4.9)
City of residency (%)	
Victoria	10.3
Vancouver	23.3
Calgary	12.3
Edmonton	14.0
Winnipeg	4.8
Toronto	24.7
Montreal	10.7
Need factors	
PCS, mean (SD) (Range: 0–100)	51.0 (8.7)
MCS, mean (SD) (Range: 0–100)	48.3 (10.4)

[a] Included Taiwan, Vietnam, Southeast Asia, and other countries.

a religion; over a quarter reported having a western religion such as Christianity or Catholicism; and the remaining 31% reported a non-Western religion such as ancestor worship or Buddhism. Most (37.7) reported elementary education level. About a tenth (12.9%) received no formal education. A third (37.7%) reported secondary education level while participants with post-secondary education level accounted for 20.5%. Over half of the participants (52.1%) came from Hong Kong, followed by the ones from other countries (20.6%) such as Vietnam (8.1%), Taiwan (4.4%), other parts of Southeast Asia (4.1%) and other countries (4%). On average the participants reported residing in Canada for 18.3 years (SD = 12). The participants reported a mean of 2.5 (0.4) along the three-point scale measuring Chinese health beliefs. A mean of 3.7 (0.6) was reported for Chinese cultural values along a five-point scale.

Over a tenth (13.7%) of the participants reported to live alone. The standardized scores of social support level ranged between –0.59 and 5.8. While most participants (38.6%) reported an income level between $500 and $999, over a third (34.2%) reported an income between $1000 and $1499; 16.2% reported a personal monthly income of less than $500; 11% reported an income of $1500 and above. The participants reported a mean of 2.8 (SD = 0.6) along a four-point scale that measured self-rated financial adequacy. A score of 4.1 (SD = 0.3) was reported for the self-rated English competency, which ranged between 2 and 6. On average, the participants reported to have 4.8 types of service barriers (SD = 4.9). Most (24.7%) of the participants resided in the Toronto area, followed by the ones living in Vancouver (23.3%), Edmonton (14%), Calgary (12.3%), Montreal (10.7%), Victoria (10.3%) and Winnipeg (4.8%). In terms of health status, a PCS score of 51 (SD = 8.7) and a MCS score of 48.3 (SD = 10.4) were reported.

The selected demographic characteristics of the sample in this study were compared with the ones reported by the similar population in the 2001 Census data. Based on the public use Census data file, it was estimated that Canada had a total of 171 629 older adults age 55 and older reporting Chinese as the single ethnic origin. The mean age of this subpopulation was 67.28 (SD = 8.24). Among them, 46.6% were males and 53.4% were females. Slightly over 30% of this subpopulation reported a post-secondary education level or above. Over half (52.3%) of this population reported not having any religious affiliation, 27.1% reported a Western religion (i.e. Catholic or Protestant), and 20.6% reported a non-Western religion. A total of 8.3% of them reported living alone. The sample participants in this study were older. More of them were females, and more reported a non-Western religion. Fewer participants reported a post-secondary education level. The discrepancies between the sample and the subpopulation in the Census indicated a potentially higher need group in the sample participants. Another more probable reason for the differences was that many of the non-English speaking elderly Chinese might, due to language barriers, not take

TABLE 2. *Logistic regression analysis of TCM use, consulting doctors practices TCM, using over-the-counter Chinese herbs, using over-the-counter Chinese herbal formulas (N = 2167)*

	TCM use OR (95% CI)	Consulting TCM practitioner (herbalist) OR (95% CI)	Using over-the- counter Chinese herbs OR (95% CI)	Using over-the-counter Chinese herbal formulas OR (95% CI)
Predisposing factors				
Place of origin (ref: Mainland China)				
Hong Kong	0.64(0.50–0.83)*	ns	ns	0.51 (0.41–0.64)*
Others	0.46 (0.34–0.63)*	ns	ns	0.42 (0.31–0.55)*
Chinese health beliefs	2.56 (1.95–3.37)*	2.75 (1.97–3.84)*	2.93 (2.23–3.84)*	2.42 (1.85–3.17)*
Enabling factors				
City of residency (ref = Victoria)				
Vancouver	ns	3.21 (2.00–5.14)*	ns	ns
Calgary	ns	ns	ns	ns
Edmonton	ns	ns	ns	ns
Winnipeg	ns	ns	ns	ns
Toronto	ns	ns	ns	0.50 (0.35–0.71)*
Montreal	ns	ns	ns	ns
Need factors				
PCS	0.96 (0.95–0.98)*	0.97 (0.96–0.98)*	0.97 (0.96–0.99)*	0.98 (0.97–0.99)*
MCS	0.98 (0.97–0.99)*	0.98 (0.97–0.99)*	0.98 (0.97–0.99)*	–
Interaction terms				
Social support × PCS	ns	ns	ns	ns
Social support × MCS	ns	ns	ns	ns
df, –2 Log likelihood	32 2460.48*	32 2134.71*	32 2698.16*	32 2713.81*

Note: Only significant predictors were presented.
* $P < 0.001$.
ns = not significant.
ref = reference group.

part in the Census, resulting in the possibility of an underreported prevalence.

Among this group, a total of 65.4% or 1448 persons used both WHS and TCM, 32.5% or 719 persons used only WHS, 22 participants (1.0%) used solely TCM and 25 participants (1.1%) reported using neither TCM nor WHS. Over-the-counter Chinese herbs was used by half of the participants (50.7%), followed by over-the-counter Chinese herbal formulas—processed herbal supplements in the form of powder or pills (49.1%), Chinese TCM practitioner (herbalist) (24.1%), acupuncturist (8.3%), bone-setter (4.9%), moxibustion (2.3%) and Qi Qong specialist (0.7%). Since the levels of use of acupuncturist, bone-setter, moxibustion and Qi Qong specialist were relatively low, separate regression analyses were performed only for the other three types of TCM.

Logistic regression analysis results of TCM use (i.e. using WHS in combination with TCM) and the use of three major TCMs are presented in Table 2, with only the significant predictors presented. When the use of TCM was the dependent variable, two predisposing factors—country of origin and Chinese health beliefs; one enabling factor—social support; and both need factors—health (PCS) and mental health (MCS), were significant predictors of using TCM. When compared with immigrants from China, immigrants from Hong Kong, Taiwan and Southeast

Asia reported a lower probability of using TCM. The likelihood of using TCM increased by 2.57 times for each unit of increase of Chinese health beliefs. The probability of TCM use was 1.15 times higher for each unit increase of social support. In terms of need factors, being less healthy was associated with greater likelihood of TCM use; however, the odds ratios for PCS (OR: 0.96) and MCS (OR: 0.98) were still lower than the cultural variables. No interaction effects of social support and the two health-related need factors were significant in predicting the use of TCM.

The odds of consulting a herbalist increased 2.85 times for each unit increase of identification with Chinese health beliefs. City of residency was found as a significant predictor. Compared to living in Victoria, living in Vancouver increases one's likelihood of consulting a herbalist by 3.16 times. Being healthier is also associated with a lesser likelihood of TCM use, with the odds ratios of 0.97 and 0.98 reported for physical and mental health, respectively. The interaction effects between social support and the two need factors were not significant in predicting the use of a herbalist.

A higher level of Chinese health beliefs also predicted a greater likelihood of using Chinese herbs, with the odds ratios being 2.93. Higher social support increases the odds of using Chinese herbs by 1.14 times. Better physical and mental health reduced

the likelihood of using Chinese herbs. The interaction terms between social support and the need factors were not significant.

When compared with immigrants from China, the odds of using over-the-counter Chinese herbal formulas were lower for immigrants from Hong Kong, Taiwan and Southeast Asia. A higher level of Chinese health beliefs predicted a higher likelihood of using herbal formulas, with odds ratios being 2.42. The likelihood of using this TCM was also 1.13 times higher for each unit increase of social support. The probability of those who resided in Toronto using herbal formulas was half (OR: 0.50) of those who resided in Victoria. Finally, better physical health continued to be significant in predicting a lower probability of using over-the-counter herbal formulas, with odds ratios similar to the ones reported in use of other TCM. Once again, interaction effects of social support and the two need factors were not significant.

Discussion

A significant proportion (65.4%) of older Chinese immigrants reported using TCM in combination with WHS. The level of TCM use was higher than that previously reported in other studies,[8,9,42] perhaps due to previous studies underestimating use based upon small and/or localized samples. This study provides results with higher external validity, thereby better representing the use of TCM among Chinese-Canadians.

Similar to previous studies,[6,8] the combined use of WHS and TCM was common. A very small proportion of the participants used TCM alone, possibly as WHS is the primary medical service covered by government-funded health insurance. As TCM is generally not covered by government health care plans, those with limited financial resources used insured WHS, even if not preferred. Debate about whether TCM should be covered by government health insurance plans is beyond this study; however, considerations should be given by health care providers to the service use reality. It also means that the use of TCM should be better understood in the context of combined use of TCM and WHS.

Predicting factors of TCM use were relatively consistent across different types of TCM. Country of origin, language, Chinese health beliefs, social support, city of residency and health variables were significant predictors of overall use of TCM, or one specific type of TCM. The predicting variables identified were consistent with those in the Andersen–Newman service utilization framework.[10] While physical health and mental health were significant in predicting use of TCM, findings suggested that poor health status or higher health needs results in seeking treatments outside the Western health care system. Health care providers should be aware of such trends and pay attention to specific types of TCM used in combination with WHS. Further research is also recommended to understand what particular health problems may trigger the use of TCM by this group.

As a major enabling factor, higher social support probably reflected additional assistance to access TCM. This is consistent with the role of social support identified in previous research.[43] Culture-related factors are also important. Among the predictors identified, country of origin and Chinese health beliefs are culture-related.

Chinese health beliefs but not Chinese cultural values were significant predictors. Clearly, there are differences between Chinese health beliefs and Chinese cultural values. In this study, the items used to measure health beliefs are related to perceptions and values toward specific health issues while the ones used to measure cultural values are about social interactions, community participation and familial roles and responsibilities. Although health beliefs are part of Chinese culture, when being considered separately in this study, their effects are different from that of Chinese cultural values. This also supports the argument that while most Chinese may share Chinese cultural values, their health specific beliefs may be different. Chinese health beliefs were indeed the strongest predictor for all four dependent variables measuring TCM use; a finding reflected by the highest odds ratio. The findings also show that even if all participants share a similar ethnic origin, not all of them share the same level of use of TCM, which is considered a common traditional practice in the Chinese culture. Cultural variations do exist within the group and health care providers should take this into consideration in health assessment.

The findings in this study carry practice implications to family physicians and health professionals in the Western health care system. Despite the fact that most of the participants (96.8%) reported having a family physician who they could consult, every two out of three older Chinese immigrants reported using TCM in combination with WHS. Due to this common practice, the findings also imply that physicians working with aging Chinese immigrants should pay attention to the potential use of herbs and herbal formulas in combination with Western medicine, and take cultural factors into consideration when providing treatment and health services. Physicians should also understand patients' health beliefs, which are probably the driving force for patients' choice of health services. It is therefore important to enquire about patients' health beliefs associated with their health concerns. Finally, the popularity of combining TCM with WHS should remind health policy makers to consider

licensing legislations to protect service users, particularly due to potential side effects when Western and TCM are being used at the same time.

Finally a few limitations of the study should be noted. First, due to inadequate sample size, this study was not able to include users who only used TCM. Therefore, the findings should be interpreted in the context of combined TCM and WHS use. Second, the study only examined the use of TCM by the participants for general unspecified purposes and did not examine TCM use for specific health problems, an area that should be further researched in future. Third, this study only provides a general picture on TCM use by one aging immigrant population in a context in which health services are predominantly Western in nature. More studies are needed to examine immigrant groups from other ethnic backgrounds.

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