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A Comparison of Psychosocial Health in North American and Chinese Canadian Cardiac Outpatients, and Ethnocultural Correlates of Quality of Life

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Objectives: To: 1) compare sociodemographic, clinical and psychosocial characteristics of Chinese Canadian and North American cardiac outpatients, 2) describe the ethnocultural characteristics of Chinese Canadian cardiac outpatients, and 3) investigate ethnocultural correlates of quality of life among Chinese Canadian cardiac outpatients.

Design: Cross-sectional.

Setting: 11 hospitals and two outpatient clinics of a Chinese Canadian cardiologist in Ontario, Canada.

Participants: 1404 ($n=96$; 6.8% Chinese Canadian) cardiac outpatients.

Main Outcomes Measures: Participants completed a survey assessing sociodemographic, ethnocultural and psychosocial characteristics. Quality of life was assessed with the MacNew instrument, which was translated to traditional Chinese character.

Results: Chinese Canadian cardiac outpatients were of significantly lower socioeconomic status, and were less likely to be working, had lower activity status, body mass index, were less likely to smoke, had better left ventricular function, and were less likely to have undergone bypass surgery than their North American counterparts. Chinese Canadians reported significantly lower quality of life and social support than North Americans. Of the Chinese Canadian participants, 13 (26.5%) felt they needed an interpreter during a cardiac medical visit but did not receive this service. Correlates of greater quality of life in Chinese Canadian cardiac outpatients were greater proficiency in both English and Chinese languages, as well as perceived ability to communicate with Canadians, to fit into social situations, and understand English jokes.

Conclusion: Some characteristics of Chinese Canadian cardiac outpatients may put their health at a disadvantage when compared to their North American counterparts, however some protective factors were also observed. Language proficiency was a key correlate of quality of life. (*Ethn Dis*. 2014;24[3]:302–309)

Key Words: Cultural Characteristics, Canada, Chinese, Cardiovascular Diseases, Outpatients

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Introduction

Non-communicable diseases are the leading cause of mortality globally, accounting for approximately 36 million deaths annually.[1] Cardiovascular diseases (CVDs) are the greatest contributor to this burden of mortality, with 17.3 million deaths each year. In Canada, CVDs are one of the leading causes of mortality, accounting for 29% of all deaths.[2] In China, CVDs are the leading cause of death for both men and women.[3]

The Chinese population is the second largest visible minority group in Canada, and is projected to grow from 1.3 million in 2006 to approximately 3.0 million in 2031. The Chinese Canadian population accounts for 24% of all minorities.[4] Recent immigrants are reported to have fewer cardiovascular risk factors than non-immigrants, a phenomenon known as the healthy immigrant effect.[5,6] However, among Canada's four major ethnic groups (White, South Asian, Chinese, and Black), Chinese Canadians were reported to have the greatest increase in cardiovascular risk factors with long-term residence (ie, >15 years in Canada).[7]

Ethnicity is a determinant of physical and mental health.[8] For instance, individuals from ethnic minority groups are more likely to report perceived discrimination[9] than non-minorities, and minority patients with other chronic diseases such as diabetes,[10] arthritis,[11] and breast cancer survivors[12] report significantly lower quality of life than

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non-minority patients with chronic disease. A number of factors have been reported to play a role in these disparities, including language proficiency,[13,14] inadequate knowledge of available services,[15] mistrust in the system, lack of availability of culturally-sensitive services, personal beliefs, family dynamics and culturally-dissimilar styles of interaction between providers and patients.[13,16] This is disconcerting considering the great degree of psychosocial distress in cardiac patients when compared to healthy populations, and the hazardous effects on mortality.[17]

However, little is known about the clinical and psychosocial health of Chinese Canadian cardiac outpatients in Canada. Accordingly, the objectives of this study were to: 1) compare sociodemographic, clinical and psychosocial characteristics of Chinese Canadian and North American cardiac outpatients; 2) describe the ethnocultural characteristics of Chinese Canadian cardiac outpatients; and 3) investigate ethnocultural correlates of quality of life among Chinese Canadian cardiac outpatients.

METHODS

Design and Procedure

This was a cross-sectional, observational study. Ethics approval was granted from all participating institutions. This article presents secondary analyses.

As part of a larger study comparing cardiac rehabilitation enrollment following different means of referral, 2635 (61.8% response rate) cardiac inpatients from 11 hospitals in Ontario, Canada were recruited.[18] Further details on the design of the study are presented elsewhere[18] After obtaining consent, clinical data were extracted from medical charts, and a self-report survey was provided to patients for completion. Among other variables, this survey assessed sociodemographic characteristics such as ethnocultural background. One year later, participants were mailed a follow-up survey assessing psychosocial well-being, including quality of life.

A further sample of Chinese Canadian cardiac outpatients was recruited from an academic health sciences center and community-based clinic run by a Chinese Canadian cardiologist in the Toronto, Canada area. After obtaining consent, the same clinical data as above were extracted from participants' medical charts, and a self-report survey was provided to patients for completion. Patients were approached in-person at the clinic in a private area to complete the survey, or alternatively clinic staff contacted the patients via phone and mailed the survey to interested individuals. The participants had the option of completing the survey in either English or traditional Chinese character. Items were professionally translated into traditional Chinese characters, with review and cultural adaptation by co-authors. The survey included most of same psychosocial scales, but also items and scales assessing ethnocultural characteristics.

Participants

Participants in this study were cardiac outpatients who self-reported their ethnocultural background as North American or Chinese Canadian. Inclusion criteria were: 1) individuals with a previous diagnosis of acute coronary syndrome or coronary artery disease, or who have undergone percutaneous coronary interventions, coronary artery bypass grafting, or valve repair/replacement. Acute coronary syndrome diagnosis was confirmed based on indication in patient chart of detailed history, focused physical examination, diagnostic ECG changes (ie, Q waves, and/or ST-T segment changes), and/or troponin levels above the 99th percentile of normal; and 2) proficiency in English, Mandarin or Cantonese (traditional Chinese character).

Exclusion criteria for the larger study were significant orthopedic, neuromuscular, visual, cognitive or psychiatric conditions, which would preclude cardiac rehabilitation participation.[19]

Measures

Self-reported sociodemographic variables measured through forced-choice response options included patient's ethnocultural background, family income, and work status. The former was the main independent variable, and consisted of 19 response options based on Statistics Canada assessment. Participants were selected where they indicated their ethnocultural background as North American (ie, Canadian, American) or East Asian (ie, Chinese). Sociodemographic variables obtained from patients' charts were age and sex.

Finally, the MacArthur Scale of Subjective Social Status[20] was administered. Using a 10-point scale that is presented as a ladder, respondents are asked to place themselves on the ladder based on his/her perceived socioeconomic status compared to others in Canada. Higher scores demarcate higher status.

Clinical Characteristics

Clinical variables obtained from patients' charts included cardiac disease history and severity indicators. Participants were also asked to self-report whether they had a comorbid condition and cardiovascular risk factors such as diabetes, hypertension, smoking, and dyslipidemia.

The Duke Activity Status Index (DASI)[21] is a brief self-administered survey to determine functional capacity through metabolic equivalents. The validity of the scale was demonstrated by strong correlations with peak oxygen uptake. This measure was incorporated into the survey as a self-reported indicator of severity, because our previous work has revealed inconsistency in cardiovascular severity demarcation in medical charts across acute care sites.

Psychosocial Health

The ENRICHD Social Support Inventory[22] is a 7-item measure developed

and validated in a cardiac randomized-controlled trial. It includes items regarding structural, tangible and emotional aspects of support, found to be predictive of outcome in cardiac patients.

The Beck Depression Inventory-II[23] is a reliable and validated 21-item questionnaire, consisting of cognitive and somatic symptoms, which assesses depressive symptom severity. It uses a forced-choice 4-alternative response format. Higher scores reflect greater depressive symptomatology, with scores >14 reflecting mild to severe symptomatology. It has been widely used in the general population and in populations with long-term illness, including cardiac problems.

The Post-Traumatic Growth Inventory (PTGI)[24] is a 21-item instrument for assessing perceptions of trauma-related positive changes. It has five subscales: New Possibilities, Relating to Others, Personal Strength, Appreciation of Life, and Spiritual Change. Participants were instructed to indicate on a six-point Likert scale (0=no change to 5=very great degree) if a life change (eg, 'I can better appreciate each day') has occurred as a result of the trauma, in this case their coronary event or procedure. The PTGI total scores are obtained by summing all 21 items, and subscale items are similarly summed, with higher scores indicating greater post traumatic growth.

Finally, quality of life was measured by the MacNew questionnaire.[25] It is a 27-item heart disease health-related quality of life questionnaire that addresses 3 domains: emotional, physical, and social. It has been shown to be valid, reliable, and responsive for assessing quality of life after acute myocardial infarction.

Ethnocultural Variables

In the Chinese sub-study, several investigator-generated items were administered to assess generation status, acculturation, language ability, and ethnic identity. Participants were asked to report whether or not they were born in Canada. If no, they were asked to report in what country they were born, and how many years they lived in their country of birth before coming to Canada. They were also asked to report how many years they have lived in Canada, whether they immigrated with other family members, and whether they had other family members who have immigrated to Canada. They were also asked to categorize the perception of their ethnic group as one of the following: Canadian/English, mostly Canadian/English, a bit of both, mostly Chinese/Asian, or Chinese.

With regard to language proficiency, respondents were asked to report their primary language spoken at home and their fluency in English through forced-choice response options. Participants were instructed to indicate on a 5-point scale their ability to understand, speak, write, and read English or Chinese (1=no ability to 5=very strong ability). Finally, they were asked to report whether they received any heart health information in the Chinese language, whether they used an interpreter during a heart health visit, and whether they perceived they needed an interpreter but did not have access to one (yes or no).

The multi-group ethnic identity measure (MEIM) was also administered.[26] The MEIM consists of 14 items that assess three aspects of ethnic identity: 1) positive ethnic attitudes and sense of belonging (5 items), 2) ethnic identity achievement, including exploration and resolution of identity issues (7 items), and 3) ethnic behaviors or practices (2 items), which consider involvement in social activities with members of one's group and participation in cultural traditions. In addition to the MEIM, an additional 6 questions were included into our questionnaire to assess other-group orientation.[26] Total ethnicity score consisted of the mean of 14 items (11 items from MEIM and 3 from the additional questions). Response options ranged from 'strongly disagree' to 'strongly agree', rated on a 4-point scale. Scores were derived by reversing negatively-framed items, summing across items, followed by calculation of the mean. When responses were missing for items, scores were calculated based on non-missing items.

Statistical Analysis

First, a descriptive analysis of the sociodemographic, clinical and psychosocial characteristics of the Chinese Canadian and North American samples was performed. Pearson chi-square analysis was then performed to compare categorical variables by ethnicity. Non-parametric Mann–Whitney U tests for independent means were used to compare the dichotomous ethnicity variable with each continuous variable, given the unequal sample sizes.

To test the second objective, the acculturation, language and ethnic identity items administered in the subsample were examined descriptively. Finally, Spearman correlations and Mann–Whitney U tests were computed to assess the association between these variables and quality of life.

RESULTS

Respondent Characteristics

A total of 1308 North American and 96 Chinese Canadian cardiac patients consented to this study (N=1404). The larger study consisted of 1809 (80.4%) retained participants, of which 1308 (72.3%) self-reported their ethnocultural background as North American and 40 (2.2%) as Chinese Canadian. Further details on the generalizability of the full sample are provided elsewhere.[18]

Of the 56 Chinese Canadian outpatients recruited through the substudy, 51 (91%) completed the survey in traditional Chinese character. The Chinese Canadian sample from the larger study did not differ significantly in any sociodemographic or clinical characteristics as compared to the Chinese sample in the substudy (data not shown).

Table 1. Comparison of sociodemographic, clinical and psychosocial characteristics of Chinese Canadian vs North American cardiac outpatients[a]

Characteristic	Chinese Canadian (*n*=96; 6.8%)	North American (*n*=1308)	Total (*N*=1404)
Sociodemographic Characteristics			
Age	66.56 ± 12.24	64.43 ± 11.19	64.56 ± 11.26
Female	19 (22.9)	351 (26.9)	370 (26.6)
Family income,[b] >50,000CAD/yr	58 (60.4)	764 (58.4)	822 (58.5)
Work status,[b] full or part-time	16 (25.0)	501 (38.7)	517 (38.0)[c]
Subjective socioeconomic status	4.61 ± 2.11	6.32 ± 1.81	6.24 ± 1.86[e]
Clinical Factors			
Hypertension, yes	42 (77.8)	859 (71.4)	901 (71.7)
Systolic BP, mm Hg	124.84 ± 18.44	127.05 ± 20.06	126.96 ± 19.99
Diastolic BP, mm Hg	69.75 ± 11.90	70.84 ± 12.28	70.80 ± 12.26
Dyslipidemia, yes	39 (72.2)	868 (80.2)	907 (79.8)
Total cholesterol	4.06 ± .93	4.20 ± 1.22	4.19 ± 1.21
HDL, mmol/L	1.11 ± .25	1.05 ± .33	1.05 ± .33
LDL, mmol/L	2.27 ± .74	2.43 ± 1.03	2.42 ± 1.02
Duke Activity Status Index [b]	37.19 ± 15.50	41.67 ± 15.92	41.35 ± 15.92[c]
Body mass index	25.71 ± 2.77	29.42 ± 5.82	29.32 ± 5.79[e]
Current smoker	3 (6.4)	230 (19.5)	233 (19.0)[e]
CCS Class ≥III	267 (53.2)	9 (39.1)	276 (52.6)
LVEF, <40%	3 (7.7)	159 (21.8)	162 (21.0)[c]
Current or previous unstable angina, yes	19 (24.4)	261 (20.2)	280 (20.4)
Current or previous MI, yes	15 (19.2)	380 (29.4)	395 (28.8)
Current or previous PCI, yes	19 (24.4)	436 (33.7)	455 (33.2)
Current or previous CABG, yes	14 (18.2)	461 (35.6)	475 (34.6)[d]
Current or previous HF, yes	5 (6.4)	158 (12.2)	163 (11.9)
Current or previous arrhythmia, yes	7 (9.0)	156 (12.1)	163 (11.9)
Current or previous valve repair, yes	5 (6.4)	97 (7.5)	102 (7.4)
Diabetes, type 1 or 2, yes	18 (34.0)	394 (32.9)	412 (33.0)
Psychosocial			
Enriched Social Support Inventory	26.07 ± 7.08	28.93 ± 5.81	28.79 ± 5.91[e]
Beck Depression Inventory-II	8.89 ± 8.58	7.94 ± 8.08	8.00 ± 8.11
Post-traumatic Growth Inventory	53.26 ± 27.53	44.74 ± 24.04	45.28 ± 24.35[c]
Quality of life	5.28 ± 1.01	5.74 ± 1.03	5.71 ± 1.03[e]

LVEF, left ventricular ejection fraction; MI, myocardial infarction; PCI, percutaneous coronary intervention; CABG, coronary artery bypass graft; HF, heart failure.
[a] Data are mean ± SD or *n* (%).
[b] Self-reported data. Other clinical characteristics extracted from medical charts.
[c] $P<.05$, [d] $P<.01$, [e] $P<.001$, Chinese compared to North American using Pearson's Chi Square test for categorical variables, and non-parametric independent samples Mann-Whitney U test for continuous variables.

Table 1 shows the sociodemographic and clinical characteristics of the North American and Chinese Canadian samples. A significantly greater percentage of North American participants were working as compared to the Chinese Canadians, and they had significantly higher subjective SES. In terms of clinical characteristics, the North American group had a significantly greater proportion of smokers, they had lower ejection fraction, higher body mass index, and higher functional capacity (DASI) compared to the Chinese Canadian participants. The North American participants also had more often undergone coronary artery bypass surgery than Chinese Canadians.

Psychosocial Health

As shown in Table 1, and as per the remainder of the first objective, social support was significantly lower, and post-traumatic growth significantly higher in the Chinese Canadian compared to the North American group, but there was no difference in depressive symptoms. Overall, 165 (18.8%) North American and 14 (23.7%) Chinese Canadian participants would be considered to have elevated depressive symptoms (ie, mean score on BDI-II above 14). Finally, quality of life was significantly lower in the Chinese Canadians.

Ethnocultural Characteristics of Chinese Canadian Cardiac Outpatients

With regard to the second objective, the self-reported ethnocultural characteristics of the Chinese Canadian cardiac outpatient subsample are shown in Table 2. In the sub-study, 33 (67.3%) of participants were born in China, 12 (24.5%) were born in Hong Kong, and

Table 2. Self-reported ethnocultural characteristics of Chinese Canadian cardiac outpatients, and their relation to quality of life (*n*=56)

Characteristic	*n* (%)	Mean ± SD	Quality of Life[a]
Immigration			
Duration of stay in home country prior to arrival in Canada, years		42.78 ± 17.21	−.15
Duration of stay in Canada, years		21.76 ± 12.22	.21
Came to Canada with other family members, yes	42 (85.7)		−.19
Ethnocultural identity			
Self-Identified ethnicity			
Chinese	33 (66.0)		−.19
A bit of both, Canadian and Chinese	15 (30.0)		
Canadian/English	2 (4.0)		
Total ethnic identity	52 (93)	3.09 ± .52	−.09
Ethnic behavior	48 (86)	2.88 ± .73	−.14
Ethnic identity achievement	51 (91)	2.95 ± .47	−.03
Ethnic belonging	51 (91)	3.42 ± .69	.09
Attitude toward other ethnic group	50 (89)	2.96 ± .57	.22
Number of times Chinese medicine, or alternative medicine have been used in the last 12 months		1.19 ± 3.46	−.32[c]
Language ability			
Primary language used at home			
Cantonese	65.2 (30)		−.03
Mandarin	28.3 (13)		
Other	4.3 (2)		
Some English and some not	2.2 (1)		
English	0		
Self-rated English fluency [b]		3.98 ± 1.12	−.32[c]
Understands English [b]	52 (93)	2.52 ± 1.23	.33[c]
Understands Chinese	52 (93)	4.20 ± .84	.40[d]
Speaks English	52 (93)	2.54 ± 1.31	.32[c]
Speaks Chinese	51(91)	4.39 ± .96	.25
Writes English	52(93)	2.40 ± 1.26	.28[c]
Writes Chinese	51(91)	4.06 ± 1.03	.33[c]
Reads English	51(91)	2.39 ± 1.25	.44[e]
Ability to communicate with Canadians	52(93)	2.77 ± 1.26	.38[d]
Ability to accustom and fit into social situations	52(93)	3.02 ± 1.21	.34[c]
Ability to understand English jokes	50(89)	2.18 ± 1.21	.34[c]
Received information translated into Chinese regarding heart health, yes	26 (52)		.11
Usage of interpreter during medical visits, yes	26 (51)		.23
Have felt the need for an interpreter, but did not receive it, yes	13 (26.5)		.13
Since diagnosis of heart condition, the number of times the following were sought in the last 12 month			
Yoga		1.96 ± .20	−.05
Acupuncture		1.94 ± .24	−.17
Tai Chi		1.82 ± .39	.23
Herbal/non prescription medications		1.80 ± .40	.18
Vitamins and minerals		1.73 ± .45	.03

[a] Spearman correlation or Mann-Whitney U parameter, as applicable.
[b] Rated on a scale from 1 (not at all fluent) to 5 (completely fluent).
[c] $P<.05$.
[d] $P<.01$.
[e] $P<.001$.

4 (8.1%) were born elsewhere. None of the participants in the sub-study were born in Canada. The range in years lived in home country prior to immigration to Canada was 3–71, and of stay in Canada was 1–42 years. Chinese Canadian participants reported participating in alternative forms of exercise such as yoga, acupuncture, and tai chi during the past 12 months.

With regard to the final objective, Table 2 also displays the association

between ethnic identity, acculturation items, and language proficiency with quality of life. Ethnic identity was not associated with quality of life. However, language proficiency, including understanding, speaking, reading and writing Chinese and English, ability to communicate with Canadians, ability to accustom and fit into social situations, and ability to understand English jokes were all positively correlated with greater quality of life in Chinese Canadian cardiac outpatients. Quality of life was significantly and negatively related to fluency in English and number of times participants had seen a practitioner providing Chinese medicine/alternative medicine.

DISCUSSION

The Chinese Canadian cardiac outpatients were all first-generation, and had lived in Canada for approximately 22 years. They reported being more fluent in a Chinese language than English, and still generally considered their ethnic identity to be Chinese. Almost all patients communicated in a non-English language at home. Chinese Canadians were less often smokers, and they had lower body mass index as well as socioeconomic status than their North American counterparts. In addition, Chinese immigrants had significantly lower social support and quality of life. The latter is disconcerting given the long history of these patients in Canada.

Approximately half of patients reported receiving heart health information in Chinese, and just less than half reported using an interpreter during a health care visit. With regard to the latter, the national Heart and Stroke Foundation (http://www.heartandstroke.com) has developed patient information materials for Chinese patients and, thus, it is unfortunate that a greater proportion of patients had not accessed, or recalled accessing these materials. Moreover, while

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many of the Chinese Canadian patients were treated by a Chinese cardiologist in this study, they would likely have received acute care by a non-Chinese specialist. Given the low degree of English-language fluency in this sample, clearly we could be doing more to ensure patients understand their treatment, as well as the recommended secondary prevention strategies to promote survival.

Previous research in other diseased and healthy populations has shown social support is affected by culture. For instance, European-Americans are found to more often seek social support than those of Asian-American, or Asian background during times of stress.[27] Similarly in the current study, the Chinese Canadian patients reported significantly lower social support as compared to the North American patients. Yet, 86% of these patients indicated that they had immigrated to Canada accompanied by other family members. This suggests that the lower perceived social support may not be related to family, but rather support from other sources such as the community or the health system. This may also be explained by the fact that the Chinese Canadians were less-often working than their North American counterparts, and would not receive co-worker support.

Post-traumatic growth has been associated with reduced morbidity,[28] and with seeking non-urgent health care such as secondary prevention[29] in cardiac patients. It has not previously been examined whether there are ethnic differences in post-traumatic growth in cardiac samples. A novel finding herein is that Chinese Canadian cardiac outpatients indeed reported significantly higher post-traumatic growth compared to North American outpatients. To the extent that such positive cognitions improve the psychosocial health of patients, this could serve as a motivation to adhere to physician recommendations for secondary prevention.

Language proficiency is a major enabling factor for health care utilization, and hence health outcome. Indeed, previous research has demonstrated that health care access and use were reported to be lower in immigrants with lower English-language proficiency in Canada.[30] Lack of English-language proficiency has been reported to affect health-related quality of life in people of Chinese and Korean background.[31] Consistent with this report, we found that English proficiency (understanding, speaking, reading and writing), ability to fit into social situations, and ability to understand English jokes were all positively correlated with quality of life in Chinese Canadian cardiac outpatients. Interestingly, proficiency in Chinese, including understanding, reading and writing, were also positively associated with quality of life. This may be explained by the study setting in the Greater Toronto Area, which is considered one of the most ethnically-diverse cities in the world. It boasts a large Chinese population, and offers many culturally-sensitive services (ie, health care, shopping centers).

Limitations

There are several limitations to this study. First, this design was cross-sectional, and thus causal conclusions cannot be drawn. Second, there was a large difference in the size of the North American versus Chinese Canadian sample. Indeed, the study may be underpowered to detect true differences between the Chinese Canadian and North

Americans. Non-parametric analyses were undertaken for comparisons between ethnic groups to mitigate statistical assumptions regarding homogeneity of variance, however replication with a larger sample of Chinese Canadians is warranted prior to drawing firm conclusions. Third, the translation and cultural adaptation of the English-language psychometrically-validated scales may have introduced error, such that differences observed in Chinese Canadian and English responses may be due to measurement error, rather than only to ethnocultural differences. Future research is needed following psychometric validation of the Chinese version of the scales. Fourth, there could be some bias between samples introduced through our additional recruitment of Chinese Canadians at additional settings where North American participants were not recruited. Fifth, generalizability is limited by reliance on Chinese Canadian patients primarily from one cardiologists' practice. Findings are likely also limited in generalizability beyond first-generation outpatients who have immigrated many years earlier. Finally, there were some differences in the sociodemographic and clinical characteristics of the North American and Chinese Canadian samples which may have biased the findings in relation to differences in psychosocial health.

In conclusion, Chinese Canadian cardiac outpatients have lower socioeconomic status, social support, quality of life, and higher post-traumatic growth than North American cardiac patients. Proficiency in English and Chinese languages were associated with greater quality of life in Chinese Canadian cardiac outpatients. These results should enable health care workers to better understand the needs of Chinese Canadian cardiac patients, and to optimize their recovery.

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