DETERMINATION OF CHINESE CANADIANS' QUALITY OF LIFE WITH NUTRITION-RELATED FACETS

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ABSTRACT

Purpose

The World Health Organization (WHO) defines Quality of Life (QOL) as satisfaction with physical health, psychological, social relationships and environment domains. The objective was to use the WHOQOL questionnaire, with the addition of nutrition-related facets, to assess Chinese Canadians and relate to relevant demographic, dietary and traditional health belief (THB) variables.

Methods

Using probability sampling, 106 adult Chinese Canadians were recruited from community organizations. Telephone interviews, employing the tested questionnaire, were conducted in Cantonese or Mandarin. Data were analyzed through MSExcel and SPSS statistical software.

Results

Overall participants were satisfied with QOL and general health, and had relatively better physical health and environmental domains compared to the other two domains. Longer residency in Canada and higher English proficiency corresponded to higher QOL, physical health and environmental domain scores. Those who had adapted their THB to Canadian practices had significantly higher QOL and environmental domain scores.

Conclusions

The WHOQOL, with the addition of the nutrition-related facets, is a valid and reliable tool to assess cross-cultural groups. QOL of immigrants can be enhanced with English language supports and culturally appropriate nutrition resources. Future research should explore QOL with more recent, younger immigrants and those of lower socio-economic status.

Key Words: quality of life; WHOQOL; nutrition; diet; Chinese Canadians

INTRODUCTION

The quality of life (QOL) concept was initially described by social scientists in the 1970s. Since then there has been a growing interest in measuring QOL in medicine, nursing and other healthcare areas [1]. According to the World Health Organization (WHO), QOL is a broad ranging concept affected by one's perception of the domains of physical health, psychological state, social relationships and relationships to the salient features of their environment [2]. QOL is determined by how important and how satisfied one is with a particular domain or domains. For example, one can be dissatisfied with a domain considered to be of relatively little importance and still maintain a good QOL. However, if one is dissatisfied with a domain of great importance, one would be more likely to perceive a lower QOL. An instrument incorporating these domains and 24 facets has been tested and developed simultaneously and collaboratively in 20 different international field centres including 18 developed and developing countries using 19 languages; and as such, the WHOQOL incorporates cultural components rather than acknowledging cultural influence as an extraneous variable [2].

One's experience of foods, eating habits and physical activity are also important to perceived QOL. For example, food is considered to be a sensory and psychological pleasure to many people. Eating traditional meals may provide a sense of security and meaning to new immigrants, giving them a feeling of control over their environment. Regular physical activity is also a viable strategy for improving both health and QOL of an individual. However, none of the WHOQOL domains directly assessed these issues.

Amarantos, Martinez and Dwyer [3] emphasized the need to incorporate a broader conceptual model of the nutritional dimensions of QOL, including experiences associated with dietary behaviours (e.g. satisfaction and/or enjoyment with diet and social aspects of eating). As proposed by Drewnowski and Evans [4], the physical health domain should also include one's dietary choices, eating habits, intakes of dietary supplements and physical ability including access to food and shopping or any assistance with eating. Body image, perceived health benefits and satisfaction with diet quality and fitness should be measures of psychological well-being; social interactions and company at meals are important factors in the social relationship domain; and, issues related to food security and access to nutrition-related resources should be considered as facets in the environment domain [4].

No empirical research study has been done to incorporate the relationships among QOL and nutrition-related facets [3,4] nor how Chinese immigrants perceive their QOL. Therefore, the objective, to assess QOL, incorporating recommended nutrition-related facets, of Chinese Canadians was part of a larger study of dietary habits and traditional health beliefs (THB) [5].

METHOD

As previously reported [5], this was an ethics approved study conducted in late 2005, early 2006. Older adults of Chinese descent living in and around Toronto were recruited from five Chinese community groups randomly selected from the Greater Toronto Municipality. Recruitment excluded those with diet restrictions due to chronic conditions or religious reasons. After reading and signing a consent form, available in English and Chinese, participants responded verbally to the questionnaire during a 15-20 minute telephone interview conducted by the researcher, fluent in Cantonese and Mandarin.

The questionnaire addressed socio-demographic characteristics including self-reported English proficiency, length of residency in Canada, marital status, body mass index (BMI) and physical activity. Specific dietary habits (fat-related behaviours and the consumption frequency of fruits and vegetables) and adherence to THB were also addressed in the questionnaire. These findings were previously reported [5] but relationships to mean QOL scores will be reported in this paper.

The 29 QOL questions were adapted from a short version of the WHOQOL instrument referred to as the WHOQOL-BREF [6,7] and from suggested nutrition-related facets [4] (Table 1). Questions dealing with dietary choices and eating habits were excluded as they were addressed in detail in other sections of the overall study questionnaire [5]. The scoring of all these questions were based on the five-point Likert scale, ranging from 'very poor' to 'very good', 'very dissatisfied' to 'very satisfied', 'not at all' to 'an extreme amount', 'never' to 'always', or 'never true' to 'always true'. Cronbach's alpha for the four domain scales modified to include the nutrition-related facets ranged from 0.626 to 0.802, indicating good internal consistency.

To enable comparisons between domains composed of unequal numbers of items, the raw scores within each domain was transformed to a 0 to 100 scale such that the lowest possible score was zero, and the highest possible score was 100. Higher scores indicated greater satisfaction in the domain. The raw scores were transformed using the following formula [6,7]:

Transformed score = [(actual raw domain score - lowest possible raw domain score)/possible raw domain score range] x 100

Simple and multiple regressions were conducted to explore relationships among general health and overall QOL with the four domains. Finally, one-way ANOVA and independent sample t-tests were used to test whether or not mean QOL scores varied significantly by any of the demographic, dietary habits and THB variables. The level of significance used was $p \leq 0.05$.

RESULTS

As previously reported [5], of the 182 subjects approached, 145 consented to participate in the study, 29 were excluded due to not meeting eligibility criteria and 10 were non-responders; therefore

there were 106 participants. Ages ranged from 45 to 64 years, 73% were female, 93% were married and 62% had been in Canada for more than 10 years. The majority had high school or better education and 58% reported fair or better English language proficiency. Self-reported BMI ranged from 15.6 to 31.4 with a mean of 21.8 ± 2.5. Participants reported almost daily consumption of fruits and green leafy vegetables, and employed a variety of practices to reduce fat intake. THB practices, such as balancing *Yin* and *Yang* foods to promote health were very prevalent [5].

Quality of Life

Table 1 lists the frequency of participants' responses for each domain and facet. The majority of responses were distributed in the upper ends of the scales, although lower scores were reported for some items such as sleep and rest, fitness level, body image and several items in the environmental domain.

Table 1 Frequency Responses (%) for QOL Domains and Facets (n=106)

Domains and Facets	Poor QOL				Good QOL
	1	2	3	4	5
Physical Health Domain:					
Q2. Pain and discomfort	0.0	1.9	11.3	29.3	57.6
Q3. Mobility	0.0	0.0	3.8	17.0	79.3
Q9. Energy and fatigue	0.0	0.0	20.8	43.4	35.9
Q12. Sleep and rest	0.9	9.4	30.2	43.4	16.0
Q13. Activities of daily living	0.0	0.9	15.1	67.0	17.0
Q14. Working capacity	0.0	0.0	22.6	65.1	12.3
Psychological Well-Being Domain:					
Q4. Positive feelings	0.9	4.7	22.6	28.3	43.4
Q5. Spirituality, religion and personal beliefs	0.0	3.8	23.6	27.4	45.3
Q6. Thinking, learning, memory, concentration	0.0	3.8	15.1	42.5	38.7
Q15. Self-esteem	0.0	0.9	17.0	70.8	11.3
Q21. Satisfaction with appetite	0.0	0.0	9.4	70.8	19.8
Q22. Satisfaction with fitness level	0.0	2.8	31.1	57.6	8.5
Q23. Body image and appearance	0.0	2.8	37.7	53.8	5.7
Q24. Negative feelings	0.0	2.8	33.8	35.9	27.4
Q25. Satisfaction with food quality	0.0	0.0	17.0	64.2	18.9
Q26. Satisfaction with food taste	0.0	0.0	21.7	68.9	9.4
Social Relationships Domain:					
Q16. Personal relationships	0.0	0.0	18.9	68.9	12.3
Q17. Practical social support	0.0	0.0	13.2	74.5	12.3
Environment Domain:					
Q7. Freedom, physical safety & security	0.0	3.8	16.0	26.4	53.8
Q8. Physical environment	0.0	1.9	17.0	30.2	50.9
Q27. Financial resources	0.0	0.9	16.0	65.1	17.9
Q11. Acquiring new information and skills	0.0	10.4	24.5	36.8	28.3
Q10. Opportunities for recreation and leisure	0.0	11.3	16.0	31.1	41.5
Q18. Home environment	0.0	0.9	7.6	73.6	17.9
Q19. Access to health and social care	0.0	6.6	33.0	52.8	7.6
Q20. Transport	0.0	1.9	3.8	20.8	73.6
Q28. Food security	0.0	2.8	15.1	59.4	22.6
General health (Q1)	0.0	3.8	35.9	57.6	2.8
Overall QOL (Q29)	0.0	0.0	24.5	59.4	16.0

Table 2 presents the transformed scores for the domains, overall QOL and GH. Participants reported a relatively better physical health and environmental well-being as compared to their psychological health and social relations. The four domains have all or almost all the scores in the upper range; three domains were fairly normally distributed but the environmental domain was positively skewed with 50% of scores above 80%. Scores for overall QOL and GH were also in the positive range.

Table 2 Transformed Scores of QOL Domains, General Health and Overall QOL (n=106)

QOL	Possible Range	Actual Range	M±SD
Physical Health	0-100	54.17-100.00	78.62±10.27
Psychological Well-Being	0-100	42.50-97.50	73.82±9.99
Social Relationship	0-100	50.00-100.00	74.06±12.16
Environment	0-100	38.89-94.44	77.33±11.49
General Health	1-5	2-5	3.59±0.61
Overall QOL	1-5	3-5	3.92±0.63

Three simple regression models (Table 3) related overall QOL to participants' perception of their physical state, psychological well-being, and environmental conditions. Similarly, GH can be predicted based on any one of the domains physical health, psychological well-being, and social relationships. Although the slopes were significant in these models, the relationships were not very strong with r^2 values ranging from 10% to 24%. The strongest relationship, between overall QOL and GH, r^2 (104) = 0.247, indicates that participants who perceived themselves as healthy were also more likely to be satisfied with their lives.

No multi-linear relationship was found for overall QOL and the four QOL domains. Using stepwise selection, a significant multi-linear relationship was found for GH. Physical health (slope=0.019, t(103) = 3.367, p = 0.001) and social relationships (slope=0.011, t(103) = 2.376, p = 0.019) were the significant predictors, accounting for 20% of the variation in participants' perceived GH.

Table 3 Linear Regression Models of Overall QOL and General Health on the Four QOL Domains

Dependent Variable	Independent Variables	R^2	Slope	T	Degree of Freedom	Significance Levels
General Health	Model 1: Physical Health	0.154	0.023	4.349	104	***
	Model 2: Psychological Well-Being	0.147	0.024	4.233	104	***
	Model 3: Social Relationships	0.110	0.017	3.577	104	***
Overall QOL	Model 1: Physical Health	0.111	0.021	3.612	104	***
	Model 2: Psychological Well-Being	0.101	0.020	3.427	104	***
	Model 3: Environment	0.242	0.027	5.766	104	***

*p≤0.05; **p≤0.01; ***p≤0.001

Relationships to variables

Table 4 summarizes the significant relationships between mean scores for overall QOL, GH and the QOL domains with the demographic, dietary habits and THB group variables. Longer length of residency in the host country and higher English proficiency corresponded to higher mean overall QOL, perceived physical health and environmental well-being scores. However, the scores reached a plateau

after 15 years of residency. Higher English proficiency was also associated with higher average GH scores, but this effect was most significant for people with good English levels and no additional benefits were found among individuals with excellent English proficiency.

Table 4 Significant Relationships between Mean QOL Scores and Variables (n=106)

Factors	N	Overall QOL M±SE	General Health M±SE	Physical Health M±SE	Environmental M±SE
All respondents	106	3.92±0.06	3.6±0.06	78.62±1.00	77.33±1.12
Residency in Canada					
- 0-5 years	12	3.5±0.2		72.2±3.9	64.8±4.2
- 6-10 years	28	3.7±0.1		78.4±1.9	75.8±2.1
- 11-15 years	25	4.0±0.1		82.2±1.6	80.6±1.8
- >15 years	41	4.1±0.1		78.5±1.6	80.1±1.5
Statistic and Significance		F(3,102)=5.64***		F(3,102)=2.67*	F(3,102)=7.54 ***
English Proficiency					
- Poor	15	3.6±0.16	3.5±0.2	73.1±2.4	68.7±4.0
- Fair	61	3.9±0.07	3.5±0.1	78.8±1.4	78.4±1.2
- Good	24	4.1±0.14	3.9±0.1	79.2±1.8	78.2±2.4
- Excellent	6	4.5±0.22	3.7±0.2	88.2±3.6	84.7±3.4
Statistic and Significance		F(2,102)=4.40**	F(3.102)=3.21*	F(3,102)=3.46*	F(3,102)=4.22 **
THB					
- THB-Weak	27	3.7±0.13			72.9±2.5
- THB-Moderate	35	4.0±0.10			81.1±1.4
- THB-Strong	44	3.9±0.10			77.0±1.8
Statistic and Significance		F(2,103)=3.42*			F(2,103)=3.11 *
Gender					
- Male	29		3.8±0.1		
- Female	77		3.5±0.1		
Statistic and Significance			t(69)=2.83**		
Marital Status					
- Married	99				77.9±1.1
- Not married	7				69.0±4.3
Statistic and Significance					t(104)=2.00*
Physical Activity					
- ≤ 1 times/week	23			73.9±2.2	72.2±2.6
- 2-3 times/week	31			77.8±1.4	76.6±2.0
- 4-6 times/week	19			77.0±2.6	78.1±2.4
- Daily	32			83.9±1.7	82.0±1.7
Statistic and Significance				F(3,101)=5.11 **	F(3,101)=3.63 *

*p≤0.05; **p≤0.01; ***p≤0.001

Respondents in the THB-Moderate group also had significantly higher mean overall QOL and environmental well-being scores than those in the THB-Weak group but there was no difference between THB-Weak and THB-Strong groups. Male respondents had higher average GH scores than females and marital status was associated with higher mean environmental scores. As might be expected, those who perform physical activities on a daily basis were more likely to have higher mean physical health as well as environmental well-being scores.

No significant associations were found in the mean psychological well-being and social relationship scores for any of the variables except the mean social relationship scores and BMI approached significance. At the normal BMI range, higher average social relationship scores were seen (F(3,102)=2.58,p<.06) compared to the underweight, overweight or obese BMI categories.

DISCUSSION
Quality of Life

The overall QOL and GH scores indicated that a majority of the participants were satisfied with their lives and health. This is expected because our study excluded people with chronic illnesses and certain medical conditions. A recent report using Statistics Canada data also supported this finding; compared to the Canadian-born, immigrants (in particular the recent and non-European immigrants) were generally in good or better health, have similar or better health behaviours, and make less frequent use of health services [10].

While it is interesting to note variations in facet scores, they are meant to be compiled for the QOL domains [2]. The relatively lower domain scores for psychological state and social relations as compared to the other two domains may be explained by changes or losses to relationships as a result of immigration. A study of Central American immigrants in Los Angeles [8] identified many factors contributing to increased levels of acculturative stress such as family disagreement with the decision to migrate and future expectations. In a qualitative study, older Chinese and Korean immigrants commented on the challenge of transition to the North American culture they perceive as highly focused on individual achievements and independence as compared to their culture as having more of a collectivist approach and strongly kinship oriented [9].

Linear regression analyses indicated that the overall QOL was significantly associated with three of the QOL domains; individuals who are satisfied with their lives are more likely to perceive satisfaction with physical health, psychological health and their environment. Social relations are known to be associated with improved QOL in many studies [6,7,11], but our analyses did not demonstrate this relationship. It is unclear why this was so.

GH was also significantly related to three domains; individuals who have good physical and psychological health and social supports are more likely to have positive feelings about their overall health. Multiple regression analysis showed that better physical health and social relationships improved participants' perceived GH; a slight discrepancy from the linear regression.

Relationships to variables

Length of residency and English proficiency

Participants who had lived in Canada longer and had higher levels of proficiency in English were overall more satisfied with the quality of their lives and had better perceived physical health and environmental well-being than their counterparts. By contrast, studies on the length of residency and QOL [12,13] have shown that the most recent immigrants were more likely to encounter anxiety with their new environment, unemployment and lack of nearby relatives. The plateau after 15 years of residency in Canada suggests that this time period is necessary for immigrants to establish themselves in the new environment to achieve their goals and expectations in terms of economics, status and relationships [14-17].

The relationship between length of residency in Canada and perceived physical health domain is different from some recent studies of middle-aged (45-64 years) immigrants in Canada, which found that those who immigrated less than 10 years had better self-reported health compared to their longer-term counterparts [18]. This might be due to immigrant self-selection whereby the healthiest and wealthiest were the ones most likely to migrate [18,19]. However, those who had been in Canada for 20 to 30 years were found to be associated with poorer physical health and had levels of overweight or obesity similar to or higher than those of native-born Canadians due to acculturation [19].

Limited English capacity is a major barrier to effective healthcare and perceived health [20]. Healthcare providers unfamiliar with a particular Chinese dialect may not be able to effectively communicate their recommendations. Immigrants with limited English proficiency reported problems understanding a medical situation, trouble understanding labels and medication reactions [20]. It may be predicted that immigrants who have lived in Canada for more than 10 years were more satisfied with their

environment because they were more familiar with the Canadian society and able to locate required information and resources.

Traditional health beliefs

Individuals in the THB-Moderate group perceived better overall QOL and environmental well-being than those in the THB-Weak or –Strong groups suggesting that people who adhered to THB, but also influenced by the Western health concepts, were happier and more satisfied with their lives. This finding agrees with a study of 44 elderly Chinese in Taiwan, which found that THB exerted a positive influence on perceived QOL as it provided guidance for these people in dealing with the process of aging [21]. It is possible that by finding a way to incorporate their THB, immigrants can retain a stronger sense of identity and belonging to their own culture, and hence a better QOL [22]. Similarly, these individuals will also be more satisfied with their environment.

Gender and marital status

Our results suggest that being male was related to higher satisfaction with GH. While there is evidence indicating that women should be more satisfied with health [23]), this may be due to our finding that both genders practiced a healthy lifestyle or due to differences from the Western cultural norms of gender and healthy behaviours [23]. Results also indicated that perceived environmental well-being was related to being married; likely because married couples tended to have more financial stability, expanded social networks and supports, and increased healthy behaviours partly due to a sense of responsibility to a spouse [24,25].

Physical activity, BMI and dietary

Higher frequency of physical activities was associated with better physical health domain. Regular physical activity is associated with a decreased risk of cardiovascular disease and all-cause mortality and has favourable effects on weight control and body fat distribution, as well as on mental health [26,27].

Despite the evidence that associates overweight/obesity with health related QOL domains [28,29], our study did not find an association with perceived physical health. This is likely because over 80% of participants reported normal range BMI and had not yet suffered from the negative health impacts of obesity. However, it has also been reported that people were likely to underreport their body weight [30]. Interestingly, this report also found that immigrants who came to Canada more than 11 years ago had a higher prevalence of self-reported overweight/obesity compared to more recent immigrants (10 years or less), and that those from East or Southeast Asian countries were less likely to be overweight [30].

Participants who were obese or underweight reported less perceived support from friends and family, and more negative social interactions than those with normal BMI. This result is consistent with some other studies, which found that obese and underweight individuals were subject to stigmatization, prejudice, and discrimination and were at greater risk for depression, anxiety, low self-esteem and poorer social relationships [31,32].

The lack of significant relationships in the psychological domain among participants with different demographics, dietary habits and THB in this study was unexpected. For example, regular physical activity and healthy eating can contribute towards improved psychological well-being [33,34].

Limitations

As previously discussed [5], the sample was somewhat homogeneous in regards to origins, location, education and health. Participants were recruited from organizations that may promote socialization and healthy lifestyle which may in turn have influenced the QOL. There is also the expectation that those with greater interest in health would be more inclined to participate.

RELEVANCE TO PRACTICE

This is one of the first studies to use the WHOQOL-BREF [6,7], with the addition of suggested nutrition-related facets [4] to study healthy immigrants. It was found to be a valid and reliable tool to assess cross-cultural groups. Future applications of this tested questionnaire should add questions to

assess satisfaction with dietary choices or eating habits; reliance on medicines, dietary supplements and/or herbal remedies; and the role of THB in physical health.

Overall, our participants reported good perceived physical health, psychological well-being, social relationships, and environmental well-being; and were satisfied overall with the quality of their lives and health. They adapted healthy eating patterns by reducing fat intakes and choosing fruits and vegetables on a regular basis [5] indicating that good nutrition plays a fundamental role in preserving health and well-being, and reducing the risk of chronic diseases [36].

Understanding the complexities of the components of QOL and the integration with demographics, dietary habits and THB will enable dietitians and other healthcare professionals to plan and provide more appropriate interventions for their clients [37], particularly recent immigrants. Supports to improve English language proficiency of immigrants as well as development of language and cultural appropriate nutrition tools and resources will serve to enhance healthcare and QOL.

Future research should explore QOL on more recent, younger immigrants as well as those who may be of lower socio economic status. The numbers of immigrants in Canada (permanent and temporary) have increased >45% and foreign students by >17% in the past five years [38] indicating a significantly growing segment of the population. Immigrants who have lower socioeconomic status are also more likely to experience food insecurity [39] and the impacts on health and overall QOL may lead to hunger, malnutrition and increased susceptibility to disease or chronic health conditions [40,41].

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