Mount Saint Vincent University
Department of Applied Human Nutrition

Dietary Habits, Health Beliefs and Quality of Life among Chinese-Canadians

A Thesis submitted in partial fulfilment of the requirements for the degree of Master of Science in Applied Human Nutrition

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SUMMARY OF STUDY

Chinese are the largest Asian subgroup in Canada and to varying degrees have adopted eating and lifestyle patterns of North Americans (e.g. high-fat, low fruit/vegetable diets; sedentary). They may therefore be more susceptible to higher rates of chronic diseases, including cardiovascular, hypertension, diabetes, obesity, and/or certain types of cancers. Very few research studies have examined the relationships between dietary habits and health beliefs among Chinese immigrants in North America, and virtually no research has been done to determine how either of these factors affects quality of life.

The purpose of this study is to identify the dietary habits, health beliefs, and quality of life of Chinese immigrants residing in Toronto, Ontario, and to determine the effects of these dietary and health-related practices on subjective quality of life. The WHOQOL-BREF quality of life assessment model, with the incorporation of a diet-related index, was used as a theoretical framework for this study. Using a probability sampling method, subjects were recruited from five of more than 50 organizations serving Chinese immigrants in the Greater Toronto Area. The study population consisted of 106 healthy immigrants originating from Mainland China, Hong Kong and Taiwan, ranging in ages from 45 to 64 years. A telephone interview (15-20 minutes) employing a cross-sectional questionnaire was used to solicit information regarding dietary habits, health beliefs and perceived quality of life. Each interview was conducted in participant's native language (Cantonese or Mandarin). All data were analyzed through SPSS statistical software. MSVU Ethics Review Board approved the ethical issues of this research.

This study indicated that dietary acculturation is a gradual and continuous process, which does not occur at the same rate for all immigrants. While breakfast was the first meal to be "Westernized" after immigration, largely for reasons of convenience, about 72% and 98% of the subjects chose Chinese staple foods (rice, stir-fry, noodles, and soups) for lunch and dinner, respectively. Contrary to traditional Chinese habits, 62% of participants snacked between meals. Participants reported regular intakes of fruits and vegetables (87%), and frequent practice of fat-reduced behaviours (70%) in their diet. Most participants (79%) incorporated both Chinese and Western foods and cooking methods in their diets.

Traditional Chinese health belief acculturation is also a continuous process. Traditional health practices of food modification during and after illnesses, seasonal adjustment of foods, and the balance of 'cold' or (*Yin*) and 'hot' (or *Yang*) foods to promote good health were very prevalent. Participants commonly used foods such as ginger root, ginseng, Chinese black mushroom, walnut, bitter melon, pork liver, and sea cucumber for preventing and treating illnesses. Participants were also categorized into one of three groups; those exhibiting the strongest levels of agreement with the traditional Chinese health belief questions were categorized as THB-Strong. The other two groups were THB-Moderate and THB-Weak. Compared to THB-Moderate and THB-Weak, subjects in THB-Strong group less frequently reduced the amount of added oil in cooking and/or trimmed visible fats from meat, but were more likely to reduce the intakes of deep-fried and fried foods, replace high fat foods with lower fat alternatives, and reduce meals consumed at Chinese restaurants. This finding agrees with traditional Chinese cooking in that oil and fat are considered important components of flavour, and that traditional Chinese health belief emphasizes on avoid eating deep-fried and fried foods.

A substantial number of participants were satisfied with their overall quality of life (75%) and general health (60%), had good perceived physical (84%) and psychological health (68%), social relationships (80%), and environmental well-being (76%). Simple regression models revealed that overall quality of life could be predicted based on participants' perception of their physical state, psychological well-being, and environmental conditions, and was positively associated with the length of residency in Canada ($p = 0.001$), English language proficiency ($p = 0.006$), and moderate degree of traditional health beliefs ($p = 0.04$). General health can be predicted based on participants' perception of their physical health, psychological well-being, and social relationships, and was positively associated with the male gender ($p = 0.01$) and English language proficiency ($p = 0.03$).

Chinese media (88%), friends and family (68%) were their primary sources of nutrition information. However, only 16% of the female and 1% of the male respondents had sought nutrition advice from dietitians. Less than 30% of participants reported engaging in at least 60 minutes of light intensity activities daily as recommended by the Canada's Physical Activity Guide. Male participants were found to be less physically active than their female counterparts. On a positive note, less than 3% of the participants reported that they had worried about not having enough money to buy foods in the past month. These subjects were relatively younger, had lower educational attainment and English proficiency, suggesting that the issues of food security for this group be assessed in future studies.

This study is one of the first few studies to directly relate the nutrition aspects with perceived quality of life among healthy immigrants. It is also the first study applying a traditional Chinese health belief grouping for Chinese Canadians, helpful in understanding concerns and preferences regarding diet and health. Results will provide an important basis needed to design and implement nutrition interventions to encourage immigrants to maintain a healthful traditional Chinese diet and health beliefs, and to make wise decisions when selecting Western foods. Using these results, dietitians are strongly encouraged to take a more proactive role in disseminating nutrition messages to minority populations. And finally, this study lays the groundwork for future research on dietary practices, health beliefs and nutrition-related quality of life of Chinese Canadians.

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Statement of Problem

Chinese are the largest Asian subgroup in Canada. According to the 2001 census, there were a total of 1,029,400 Chinese Canadians in Canada, comprising 3.5% of the total national population and 26% of the visible minority population (Statistics Canada, 2001). Migration from Asia to North America is associated with changing in prevalence of chronic illnesses among Chinese. For example, compared to Chinese living in Asia, those in North America have higher rates of several chronic diseases, including cardiovascular disease, hypertension, diabetes, obesity, and cancers of the colon, breast and prostate (Whittemore, Wu-Williams & Lee, 1990; Whittemore, Kolonel, Wu, John, Gallagher, Howe et al., 1995). Research indicates that the differences in disease rates among people from different countries are largely attributed to environmental factors such as adoption of high fat, low fruits and vegetables Western diets, and sedentary lifestyles (Campbell, Parpia & Chen, 1998; Yu, Harris, Gao, Gao, & Wynder, 1991)

Ethnic Chinese are very culturally and linguistically diverse and therefore present a real challenge for both researchers and nutrition educators to obtain their food consumption related information. Although some researchers have identified that the traditional Chinese diet is generally more healthful (lower in fat, higher in complex carbohydrates with moderate protein content) than a typical North American diet (Wu-Tso, Yeh & Tam, 1995), dietitians and/or other healthcare professionals are seldom emphasizing these diets. To date, very few studies have examined the dietary habits among Chinese living in Canada, and virtually no research has been done on how nutrition and dietary variables can best be integrated in the quality of life concept (Amarantos, Martinez & Dwyer, 2001; Drewnowski & Evans, 2001). More research is definitely needed to increase our understanding of what dietary habits and traditional health

beliefs the Chinese Canadians are practicing, and how they perceive their quality of life so that more culturally appropriate and effective health promotion programs can be implemented.

Research Objectives of the Study

1. To identify dietary habits, health beliefs, and perceived quality of life among Chinese-Canadians living in Toronto, Ontario;

2. To determine the differences in food selection and preparation among participants with varying degrees of traditional Chinese health beliefs;

3. To determine how demographic and nutrition related factors such as dietary habits, health beliefs, degree of acculturation, age, and education levels influence participants' perceived quality of life;

4. To qualitatively understand how participants perceive and incorporate the relationships between diet and health, and the Chinese functional foods, and Western foods into their daily lives;

5. To identify:
   a) Where participants obtain primary source(s) of nutrition information,
   b) How often participants perform light intensity of physical activities for a period of at least an hour per day,
   c) Whether or not participants have difficulties in getting access to oriental foods of their choice, and
   d) Whether or not participants experience a lack of social or economic access to adequate food, resulting in food insecurity.

Significance of the Study

With the increasing diversity of the Canadian population, dietitians and other health professionals will encounter many opportunities to counsel Asian clients, in particular the Chinese. Perceived ethnic and social differences with the dietitian often discourage clients of the minority populations from seeking care or sharing intimate information as required for appropriate treatment. These people turn to traditional health and food practices for their health and well-being (Tan & Wheeler, 1983; Satia-Abouta, Patterson, Kristal, Teh & Tu, 2002). Based on the Eastern perspective, many traditional foods can have beneficial health effects that help prevent or treat various kinds of chronic diseases (Weng & Chen, 1996; Dai & Luo, 1996; Koo, 1984). Recognizing the beneficial health effects of this cultural diet, dietitians should encourage the preservation of traditional Chinese diets and eating patterns as well as incorporate traditional health beliefs when consulting the Chinese clients. As well, with many Western people adopting traditional Chinese health practices (Borchardt, 2003; Chan, 2005), this knowledge will benefit dietitians in the care of all their clients.

This present study is one of the first few studies done to explore the effect of diet and health practices on quality of life, using the framework and definition recently developed by the WHO. Prior applications of the quality of life framework have been restricted to chronically ill populations but have rarely focused on the nutrition aspects. The findings of this study may provide a good insight on how dietary factors and health practices affect the quality of life among healthy immigrants, which may, thereby, create new perspectives for future research.

It is expected that this study will contribute to the knowledge of dietitians and nutrition educators about their clients' cultural food practices, health beliefs, and perceived quality of life. Such knowledge is important to improve their ability to counsel both Chinese and Western

clients, to plan and implement culturally sensitive (and effective) nutrition education programs that can best be tailored to individual needs.

Definition of Terms

Acculturation: A process by which a racial/ethnic group, usually a minority, adopts the behaviour (e.g. diet) and cultural traits (e.g. beliefs, religion, language) of a host country or a dominant group.

Dietary Acculturation: A process by which immigrants adopt the dietary practices and behaviours of the host country.

Food Insecurity: A situation that exists when people lack secure access to sufficient amounts of safe and nutritious food for normal development and an active and healthy life. It may be caused by the unavailability of food, insufficient purchasing power, or inadequate use of food at the household level. Food insecurity is a major cause of poor nutrition status, along with poor conditions of health and sanitation, and inappropriate care and feeding practices. It may be chronic, seasonal or transitory (FAO, 2000)

Functional Food: Any food similar in appearance to a conventional food, consumed as part of the usual diet, with demonstrated physiological benefits, and/or to reduce the risk of chronic disease beyond basic nutritional functions (Health Canada, 1998).

Immigrant: Foreign-born racial/ethnic minorities.

Quality of Life (QOL): An individual's perception of his or her position in life, within the cultural context and value systems in which he or she lives, and in relation to his or her goals, expectation, standards, and concerns (WHO, 1998).

Hypotheses

First Hypothesis: Older Chinese immigrants are more likely to follow traditional health beliefs of balancing the *Yin* and *Yang* foods in their diet than their younger counterparts.

Second Hypothesis: Immigrants who moved to the host country at an older age tend to retain traditional health beliefs than those who immigrated at a younger age.

Third Hypothesis: Individuals with stronger traditional Chinese health beliefs are more likely to select traditional ethnic foods and to demonstrate traditional eating behaviours.

Fourth Hypothesis: Less acculturated immigrants are more likely to exhibit healthful behaviours related to selecting reduced-fat diet, and consuming fruits and vegetables more often than more acculturated individuals.

REVIEW OF LITERATURE

Nutrition for Chinese Populations

Traditional Chinese Dietary Habits

Food is an important part of daily life for many Chinese people. They not only enjoy eating but also believe eating good food can bring harmony and closeness to friends and family. There are many different cuisines in China, and each province has its own special style of cooking (Chan & Lin, 2000; Woo, Leung, Ho & Chan, 1999). The Chinese enjoy shopping daily to get fresh foods from the local market. For example, they will select live seafood, fresh meats, and seasonal fruits and vegetables to ensure freshness for cooking.

Daily meals for the Chinese consist of four food groups: grains, vegetables, fruits, and meats. Grains and vegetables are, in general, regarded as the basic foods groups necessary to sustain life and should form the major part of the diet. Meats and fruits, on the other hand, are supporting and complementary foods, and therefore, are consumed in moderation. Since many Chinese are lactose intolerant, they do not consume large amounts of dairy products. Instead, they substitute this food group with soymilk, soybeans and tofu, which also contain large amounts of protein and calcium. A Chinese total diet study conducted in 1990 reported that on average, the Chinese people consumed 22% of total energy from fat, 12% from protein and 66% from carbohydrates. They obtained most of the energy from plant-based foods (85%) as compared to animal-based foods (14%), and 1% from alcohol (Chen & Gao, 1993).

Most Chinese eat three meals per day, and they seldom snack between meals. A typical Chinese breakfast contains congee (rice porridge), soft rice, noodles or rice noodles with broth, steamed buns, dumplings, warm soymilk and/or fried wheat-dough crullers. *Dim sum* is a very popular breakfast or early lunch choice among the Southern Chinese people that are usually

eaten at a restaurant. They include a large variety of labour-intensive items such as dumplings and other small dough wrapped items, long-cooked foods, and foods served steamed, baked, fried, and roasted (Ang, Liu & Huang, 1999). Lunch and dinner are served mainly with white rice, noodles, or other grain dishes such as wheat and millets, corn, oats, potatoes, yams, brown rice, and other roots and tubers, with several other hot meat and vegetable dishes that can be stir-fried, steamed, red-simmered, or deep-fried. Because of the history of unsanitary conditions in China and Hong Kong (Campbell & Chang, 1981), vegetables are very rarely eaten raw. Therefore, very few Chinese people eat salads. Vegetables are usually cooked, preferably on their own or mixed with meat, or as an ingredient in a soup. Similarly, some older Chinese often avoid drinking cold tap water as they have conditioned to drinking boiled water for sanitary reasons. They may also believe that ice water can cause the imbalance of the body internal system, and is therefore harmful to health.

People living in Southern China consume large amounts of polished rice, while individuals living in northern regions consume more noodles or steam buns (Ang, Liu & Huang, 1999). Soup is most often consumed during and at the end of the meal. Vegetables, fruits and meat are usually fresh, with the exceptions of preserved vegetables including snow cabbage or mustard greens, preserved eggs, as known as "thousand year old eggs" or salted and dried fish. Canned or frozen foods are seldom eaten. Western desserts such as cookies, cakes, pie, and ice cream are not common at main meals, and they are popular only for special occasions and banquets. After dinner, families usually eat seasonal fruit as dessert. Other Chinese style desserts such as sweet soups made with red beans, lotus seeds or papaya may sometimes be served. Tea such as green tea, black tea, and oolong are served in traditional 'tea cup' between meals. Alcohol is rarely provided with meals unless during special occasions.

Traditional Chinese Health Beliefs

Over the centuries, the Chinese have established cultural beliefs about the origin or causes of illness. This belief comes primarily from traditional Chinese medicine (TCM), which focuses on prevention of disease and promotion of health. While the theories described in TCM encompass a vast array of folk medicine practices that are not proven as per Western scientific model, they have certain degree of validity due to the long history of applications.

The most widely accepted health belief model in TCM is the *Yin* and *Yang* theory, which is based on the premise that the two opposing and complimentary forces, *Yin* and *Yang*, regulate the universe (Ang, Liu & Huang, 1999; Tan & Wheeler, 1983). Most things, including body organs, diseases, stages of the life cycle and foods (Tables 2.1 and 2.2) belong to either the *Yin* or the *Yang* category. *Yin* (or cold) represents a negative force, coolness, and the feminine side of nature, while *Yang* (or hot) represents a positive force, heat, and the masculine principles. The human body is considered as an integrated whole. To maintain harmony and balance, these forces must be in perfect equilibrium so that good health can be enhanced. Any excess or deficiency of either force is believed to result in disease.

Table 2.1
Examples of Yin (or cold) and Yang (or hot) conditions and organs (Ludman & Newman, 1984)

Yin		*Yang*	
Health Conditions	Organs	Health Conditions	Organs
Cancer	Kidney	Constipation	Bladder
Lactation	Liver	Cough	Gall bladder
Menstruation	Lungs	Hypertension	Intestines
Postpartum	Spleen[1]	Infection	Stomach
Pregnancy		Skin rash/allergy	
Shivering		Sore throat	
Wasting		Toothache	
		Upset stomach	

[1] Spleen in traditional Chinese medicine refers to entire digestive system, which is different from the concept of spleen in modern medicine.

Table 2.2
Examples of foods with Yin, neutral, and Yang properties (Ludman & Newman, 1984)

Cool & Cold Properties (*Yin*)		Plain Properties (Neutral)	Warm & Hot Properties (*Yang*)	
Bean curd	Milk	Corn	Bamboo	Liquor
Bean sprouts	Melon	Carrot	Beef	Mushrooms
Boiled foods	Oyster	Chinese yam	Broiled meat	Onions
Broccoli	Pears	Honey	Catfish	Peanuts
Cabbage	Potatoes	Noodles	Chicken	Persimmons
Citrus	Pork	Pea	Chicken soup	Pork liver
Cauliflower	Seaweed	Quail meat	Chinese date	Red beans
Celery	Soybeans	Quail egg	Eggs	Red foods
Cold foods (thermal)	Spinach	Soft rice	Eggplant	Red peppers
Congee	Turnips	Sugar	Fatty meats	Sesame oil
Cucumber	Turtle	Sweets	Fried foods	Shell fish
Day lily	Water	Wheat	Garlic	Sour foods
Duck egg	Watercress	Yam	Ginger root	Spicy foods
Fruit (some types)	Watermelon		Ginseng	Tangerines
Fish (some types)	Winter melon		Glutinous rice	Tomatoes
Ginko			Green peppers	Vinegar
Greens (most)			Hot foods (thermal)	Wine
			Leeks	

Equilibrium is perceived as a range of states rather than a fixed point. Each individual has his or her own state of equilibrium, and at different stages of life, the state of equilibrium will shift somewhere between the extremes of hot and cold (Tan & Wheeler, 1983). With increasing age, an individual tends to shift from hotter to colder body base. One can achieve equilibrium by dietary adjustment (with a careful selection of foods to maintain the body in balance of *Yin* and *Yang*), proper intakes of herbs and tonics and good living habits such as getting sufficient rest and sleep, reducing stress, keeping control of temper, and not being greatly agitated.

According to the Chinese beliefs, foods and medicines that come from the same source, are based on the same basic theories, and have the same uses (Ang, Liu & Huang, 1999; Tan & Wheeler, 1983). Foods are not only to be enjoyed for taste, but also to be appreciated for medicinal values that help maintain and improve health status, prevent and treat disease, and

facilitate rehabilitation. Such foods are referred to as functional foods or health foods (Weng & Chen, 1996).

Nutrition in TCM can be applied in four ways: food as diet, food as tonic, food as medicine, and food abstention. Food is considered as diet since it provides the necessary substances for life, growth, and health. Food as tonic refers to using food to help individuals smooth the body mechanisms, build up resistance against disease, and slow down the process of ageing. Food is categorized as medicine when some specific foodstuffs with specific properties can be used to correct imbalances that have led to disease states and particular signs and symptoms. Finally, food abstention is the practice of avoiding certain foods in certain disease conditions that would make an illness or imbalance in the body worse (Dahl, 2004). For example, avoid eating pepper, old ginger, mutton, or liquor that produces "fire" (heat) in the body, during acute inflammation, acute conjunctivitis (inflammation of the mucous membrane of the eye) or high fever; and avoid eating crabs or watermelon (cool or cold foods) during stomach pain, diarrhea and asthma. Certain foods such as most shellfish, shrimp, crab, bamboo shoots, goose, and duck eggs are believed to cause toxic reactions in the body that would lead to conditions such as skin irritation, delay wound healing, and postpartum injuries. Also, deep fried foods and dry foods (e.g. powered milk) are believed to provide an excess of *Yang* in the body, and the Chinese refer this condition to as 'hot air' in the body. Some fruits and vegetables such as banana, melon, cabbage, beans, and carrots may cause cold reaction to the body (Weng & Chen, 1996; Koo, 1984).

General Properties of Chinese Foods

Similar to medicine, each food has its own properties (cool, cold, warm, hot, and neutral) and flavours (sweet, sour, bitter, pungent, and salty). When used properly, food can regulate all

internal organs of the body to achieve a harmonious state. From the reaction of foods on the human body, foods can be classified into five categories: cold, cool, hot, warm and neutral (Table 2.2), which is known as "Five Properties" (Ang, Liu & Huang, 1999).

The cold and cool (or *Yin*) foods are used in treating diseases with a hot nature. For example, watermelon is used to treat fever, thirst, mild mania, and other similar *Yang* conditions. The hot and warm (or *Yang*) foods, on the other hand, are used to treat diseases with a cold nature, to restore the balance needed for health and to build up the strength that is lost. For example, onion and ginger are used to treat common cold, diarrhea, stomach pain, loss of appetite and other similar *Yin* conditions. Neutral foods such as soft rice are useful for treating either type of condition and can also be used as general tonics. Some individuals such as the elderly, who may already have "weak blood" (anemia), and pregnant women, whose body base is on the cold side of the health, should avoid an excess of "cold" (*Yin*) foods and concentrate on increasing the "hot" (*Yang*) components of their diets (Chau, Lee, Tseng & Downes, 1990). The property of each food may alter after it is cooked, depending on the type of cooking method being used. Many common Western cooking methods such as grilling, roasting, or deep-frying is classified as hot. Steaming, simmering and stewing are classified as neutral, whereas boiling and stir-frying are considered as cold. For example, watercress is considered a cold food, but a soup made by rapid boiling makes the watercress much cooler than one that has been boiled for several hours (long boiling) (Tan & Wheeler, 1983).

The function of various foods also depends to a certain extent on their flavours: sweet, sour, bitter, pungent, and salty (Ang, Liu & Huang, 1999; Weng & Chen, 1996). Sweet foods such as potato, lotus root, wheat, rice, peas, milk, and honey are commonly used as general tonics. Sour foods such as tomato, orange, plum, lemon, grape, vinegar and papaya have the

function of astringency. Bitter foods such as bitter melon, almond, lily bulb, orange peel, tea and coffee have antipyretic properties. Pungent or spicy foods including ginger, onion, garlic, pepper and chives have the function of disseminating heat from the body, causing perspiration. Salty foods such as seaweed and kelp have the function of softening hard masses, and therefore, are commonly used by patients suffering from tuberculosis of the lymphatic nodes of the neck and goiter.

Channel tropism is a theory relating to the therapeutic action of various foods to the corresponding internal organs, channels and various parts of the body for the purpose of interpreting their specific action (Weng, 1999). For example, wheat, lotus seed, and red beans are good for the heart; tomato, sponge gourd and papaya are good for the liver; rice, wheat, and millet are good for the entire digestive system; ginger, onion and pear are good for the lung, whereas almond, shrimp and black sesame seed are good for the kidney. Another part of this theory is the relationship of food flavours and their specific selective action on body organ, known as the organ-specific channel tropism. In this theory, bitter, sour, sweet, pungent, and salty tastes are believed to affect the heart, liver, spleen (seen as the entire digestive system), lung, and kidney, respectively. In other words, the bitter nature of tea is good for the heart, the sour taste of tomato is good for the liver, the sweet taste of lotus root is good for the digestive system, the pungent taste of ginger is good for the lung, and the salty seaweed is good for the kidney. The other notion developed from the organ-specific channel tropism is the treatment of human disease that involves specific organs with the corresponding animal organs (Weng & Chen, 1996). For example, people use sheep liver for treating liver diseases, pork thyroid for hyperthyroidism, pork pancreas for diabetes, pig's leg and trotters to strengthen the legs and pig's tail to strengthen the spine.

Attitudes towards Traditional Chinese and Western Medicines

A qualitative research study conducted in the early 1980s among 50 Chinese immigrant women who lived in central and north London, England, showed that the majority of these immigrants retained the traditional beliefs that foods are conceptualized within the framework of the "hot-cold" (Tan & Wheeler, 1983). A series of unstructured interviews were conducted to determine their view of the Chinese and Western system, and how they moved towards adopting the Western system. Health was perceived as the maintenance of sound bodily condition that included the idea of actual physical strength, vitality, resistance to disease and longevity and mental condition, and not just the absence of disease. Many participants received little formal education, and their knowledge of the traditional Chinese functional foods was derived from the Chinese tradition, passed on through experience, word of mouth, or observation. To them, foods not only had the function of satisfying the appetite and providing energy, but also closely bounded up with the causes of disease. Immigrants classified foods by describing the effects they would have on an individual's body base and by describing various functions and attributes of foods.

How Chinese immigrants perceived about food and health in the Western system depended upon their early experience of clinics, family opinion, health visitors and hospitals; what they understood of their children's experience at school; and their observations on the mainstream population. The Western medicine was viewed incomplete by many Chinese immigrants living in London, England, while the Chinese system was considered as a comprehensive approach to the preservation of health and prevention of disease (Tan & Wheeler, 1983). Another study on dietary habits and health beliefs of elderly Chinese women reported that subjects who have lived in the United States longer might have immigrated with stronger

traditional beliefs and practices of balancing 'hot' or 'cold' foods (Chau, Lee, Tseng & Downes, 1990). This belief had not been changed by their exposure to American culture, probably because of the limited exposure to American culture among these older Chinese-American women.

Both Western and traditional Chinese medicines have been used concurrently by many people in Hong Kong nowadays. Current studies on the local Hong Kong populations indicated that patients considered both types of medicines to have strengths and weaknesses (Lam, 2001; Chan, Mok, Wong, Tong, Day & Tang, 2003). People made decisions on which type of doctors they wanted to see for the specific illnesses that they were suffering from (Lam, 2001). Traditional Chinese medicine was considered to be good for some milder illnesses, such as coughs and colds, or as a supplement to Western medication, particularly after consulting the Western doctor for quick recovery. It could cure or stabilize the root of a health problem, and not just relief the symptoms. In contrast, they perceived Western medicine as more powerful and efficacious against the agents of disease, but sometimes too powerful with significant side effects, and unable to cure the root of an illness.

Health Implications of Traditional Chinese Diets

Dietary habits certainly play an important role in the etiology and management of many chronic diseases such as cardiovascular disease, hypertension, diabetes, and some types of cancers. Chinese diets are traditionally lower in fat, higher in complex carbohydrates, and moderate in protein content compared to a typical North American diet (Wu-Tso, Yeh & Tam, 1995). The health implications of traditional Chinese diet have been studied by a number of researchers (Campbell, Parpia & Chen, 1998; Yu, Harris, Gao, Gao, & Wynder, 1991; Woo, Woo, Leung, Chook, Liu, & Ip, 2001; Woo & Donnan, 1989). For example, a study on diet and

the etiology of coronary artery disease in rural mainland China (Campbell, Parpia, & Chen, 1998) found that fat intake in China was less than half of that of the United States in terms of percentage of total calories, and fiber intake was three times higher in the rural Chinese diet than the US diet on the basis of grams per day. Animal protein intake was very low in rural China, only about 10% of the US diet. These Chinese participants had a very low mean plasma cholesterol level compared to people in the United States. Mortality rate from coronary artery disease was 16.7-fold greater for US men and 5.6-fold greater for US women than for their Chinese counterparts. These results strongly support the notion that the risk of coronary artery disease decreases with increased consumption of plant-based foods and decreased consumption of animal-based foods.

Yu and colleagues (1991) compared the incidence rates of colon, rectum, prostate and breast cancers in China versus the United States. They observed that the age-adjusted incidence rate of colorectal cancer in American population was more than double that in China, possibly due to the elevated per capita intake of fat and lower intake of cereals and vegetables among the Americans. Incidence rates of colon and rectal cancers in Chinese-Americans were nearly equal to the American rates. The rates of prostate cancer and breast cancer were 26-fold and 10-fold higher in Americans than Chinese in China, whereas the rates for Chinese-Americans were intermediate. These evidences suggest that any small to moderate change of traditional diets to incorporate Western diet may cause undesirable health effects on Chinese immigrants living in North American.

Another study conducted by Woo et al. (2001) examined whether the dietary habits of Chinese populations in four geographic regions (Hong Kong, China, San Francisco and Sydney) was similar to the Mediterranean diet using the Mediterranean diet score. The main features of

the Mediterranean diet are high consumption of fruits, vegetables, legumes and grains; foods with high monounsaturated to saturated fats ratios; moderate consumption of dairy products and ethanol (mainly wine); and low consumption of meat and meat products. Results indicated that the Chinese population as a whole consumed a dietary pattern comparable to the traditional Mediterranean dietary pattern, the majority achieving a high score irrespective of acculturation, age or socio-economic factors. These findings implied that the current dietary patterns of the Chinese populations may be expected to have similar health benefits to the traditional Mediterranean diet for a reduced risk of developing coronary heart disease and a higher rate of survival among older population after a myocardial infarction.

Despite the evidence that support the beneficial effects of the traditional Chinese diet in relation to coronary heart disease, some studies argued that the Chinese diet is in fact, relatively high in sodium and low in calcium (Woo, Leung, Ho, & Chan, 1999; Woo et al., 2001). High salt intake may predispose to hypertension, which is a risk factor for stroke and coronary heart disease. For example, although the mortality from coronary heart disease is lower in Chinese compared with Caucasian populations, their mortality from stroke is much higher than the Caucasians (Woo, Leung, Ho, & Chan, 1999). Similarly, a diet with relatively low calcium can contribute to osteoporosis, and higher incidence of hip fractures concomitant with the reduction in physical activity levels (Huth, DiRienzo & Miller 2006, Woo, Leung, Ho, & Chan, 1999). In spite of these adverse features of the Chinese diet, it is considered to have healthier dietary features than the diets of the overall general population (Whittemore, Wu-Williams, & Lee, 1990). Perhaps the promotion of a Chinese ethnic diet while incorporating the low sodium and high calcium foods are important components of a healthy eating program.

Diet and Acculturation

Overview of Acculturation

The term 'acculturation' refers to a process by which a racial or ethnic group, usually a minority, adopts the cultural patterns (e.g. beliefs, religion, or language) of a dominant or host group (Satia, Patterson, Kristal, Hislop, Yasui, & Taylor, 2001a). Acculturation usually occurs at two levels. At the micro (individual) level, it is referred to as 'psychosocial' stage that involves changes in attitudes, beliefs, behaviours (e.g. dietary patterns), and values in individuals. At the macro (group) level, acculturation results in physical, biological, political, economic, and cultural changes in the acculturating group or in the society as a whole (Berry, 1980; Szapocznik & Kurtines, 1980).

Many factors affect the extent to which an individual or group to assimilate into a new society. For example, immigrants who have high level of education and high income, or those with similar cultural or physical characteristics (e.g. skin colour) to the host country are more likely to adopt the lifestyle patterns of the host country or to experience major lifestyle changes upon immigration. On the other hand, immigrants who situate in ethnic enclaves (i.e., geographically close communities of people of the same ethnic group) or who migrate involuntary (e.g. refugees) may acculturate at a much lesser extent.

Dietary Acculturation

Dietary acculturation refers to the process that occurs when members of a minority group adopt the dietary patterns and behaviour of the host country (Satia, Patterson, Kristal, Hislop, & Pineda, 2001b). It is a multidimensional, dynamic, and complex process that does not appear to be as simple as an individual moves linearly from one end of the acculturation continuum (from

traditional) to the other (acculturated) (Satia et al., 2001b; Berry, 1980; Szapocznik & Kurtines, 1980).

Research indicates that as part of the acculturation process, immigrants may find new ways to use traditional foods, exclude other foods, and/or consume 'new' foods. Therefore, immigrants may maintain their traditional dietary patterns, incorporate host country eating patterns into their diet while maintaining some traditional dietary practices, or completely adopt host country foods and dietary behaviour (Santia et al., 2001a; Pan, Dixon, Himburg, & Huffman, 1999; Satia, Patterson, Taylor, Cheney, Shiu-Thornton, & Chitnarong, 2000; Yang & Fox, 1979). For example, rice continued to be a major carbohydrate staple among many Chinese immigrants, but consumptions of other traditional foods tended to be replaced by increased consumptions of cereals, dairy products, fast foods, sandwiches and soft drinks upon immigration (Satia et al., 2001a; Pan, Dixon, Himburg, & Huffman, 1999). A qualitative study showed that Chinese immigrants were more likely to consume traditional foods at lunch and dinner, whereas breakfast and snack items were usually the first meal to be 'Westernized' (Satia et al., 2000). Research on 104 first-generation Chinese immigrants in Nebraska reported that respondents used American foods, such as canned vegetables, for preparation of Chinese dishes. Most of them consumed an American breakfast and lunch but a traditional Chinese dinner (Yang & Fox, 1979).

Several acculturation research studies have shown that longer residency in the host country (Yang & Fox, 1979; Satia et al., 2001a; Lv & Cason, 2004), higher level of education and income (Chau, Lee, Tseng & Downes, 1990; Satia et al., 2001a; Lv & Cason, 2004), being employed outside the home (Satia et al., 2001a), having young children in the household (Satia et al., 2001a), and/or fluency in the host language (Chau, Lee, Tseng & Downes, 1990; Lv &

Cason, 2004) results in increased exposure to mainstream culture and, consequently, changes in their dietary patterns. Younger immigrants generally tend to change their food habits more readily than older immigrants (Wu-Tso, Yeh & Tam, 1995; Satia et al., 2001a; Pan, Dixon, Himburg, & Huffman, 1999). Also, unavailability and high cost of traditional foods in the community will likely to result in increased consumption of foods of the host country (Satia et al., 2000). Acculturation scales have been developed and used that focus on items such as length of residence in the host country, language proficiency, generation level, and so forth. However, some researchers argued that these single item measures were very non-specific, and therefore might misclassify a respondent's level of acculturation. The dietary acculturation scales developed by Satia and colleagues (2001a) have been commonly used to assess the degree of dietary acculturation among immigrants.

Not all dietary changes associated with acculturation are necessarily detrimental. In fact, some immigrants may adopt a more healthful dietary change as a result of acculturation (e.g. increased fruits and vegetables intakes, and decreased fat intakes). For example, some younger, highly educated women reported an increased fruit and vegetable intake after immigration, probably because they had more exposure to nutrition education information from the government such as the 5-A-Day program in the United States (Satia-Abouta, Patterson, Kristal, Teh, & Tu, 2002; Satia et al., 2001a). Nevertheless, there is considerable evidence suggesting that Chinese people living in North America adopt unhealthy Western eating patterns (significantly increased in consumption of fats/sweets, and decreased in fruits and vegetables consumptions) and sedentary lifestyles, which might be important contributing factors for the rapid increased rates of chronic diseases among the North American Chinese (Lee, Wu-

Walliams, Whittemore, Zheng, Gallagher & Teh et al., 1994a; Yu, Harris, Gao, Gao & Wynder, 1991; Wu-Tso, Yeh & Tam, 1995).

A multi-centre case-control study on dietary intakes, physical activity and body size between Chinese in China and Chinese in North America (the US and Canada) found that subjects living in China consumed 22% of calories from fat, compared to 35% in the diet of North American Chinese (Lee et al., 1994a). In contrast, the percent of calories from carbohydrates was 62%-68% in China and 48% in North America. Chinese living in China also reported spending more time in vigorous activity, sleeping and walking, but less time in sitting than those in North America. They had a lower body mass index (BMI) than North American Chinese. Researchers also observed that the dietary habits of North American Chinese were more similar to those of North American Caucasians than to those Chinese in China. These North American Chinese had a higher consumption of meat and dairy products that contributed to higher intakes of protein and fat. This study implied that Chinese immigrants who moved to North America often went through a gradual and continuous process of assimilating a Western lifestyle. Therefore, it is necessary to plan culturally sensitive chronic disease prevention programs within this minority population. One of the Healthy People 2010 objectives established for people in the United States is to improve the health status of minority populations over the first decade of this century (Healthy People, 2010).

Factors Influencing Food Choices

Several studies have used the Precede part of the Precede/Proceed model to explain factors affecting the dietary practices of Chinese populations living in North America. This PRECEDE model is based on the premise that the factors important to an outcome should be diagnosed before the intervention is designed (Gielen & McDonald; 1997; Satia et al., 2000).

According to the model, factors affecting behaviour can be broadly categorized as predisposing, reinforcing, and enabling. Predisposing factors include attitudes, beliefs, knowledge, and values that provide the rationale or motivation for a behaviour. Reinforcing factors contain variables such as social support, which provide an incentive for a behaviour. Enabling factors are skills and resources that facilitate change.

Satia and colleagues (2000) had identified several major predisposing factors affecting food choices among Chinese-American women that include traditional beliefs of balancing foods, religious beliefs, perceptions on what constitutes a healthful diet, taste, dietary knowledge, and body weight-related issues. These factors can have significant effects on food purchasing, methods of cooking, and food consumption patterns (Shatenstein & Ghadirian, 1998). For example, most participants had strong traditional beliefs about the importance of combining and balancing 'cold' (or *Yin*) and 'hot' (or *Yang*) foods for good health, and the relationship between diet and health (Satia et al., 2000). Some women stated that "soup is good for the five internal organs (heart, lungs, liver, spleen, and kidneys)", and "ginger soup can unclog arteries to the heart", while others mentioned that "food can cause, prevent, and treat illness". They planned their meals according to the understanding of these traditional dietary beliefs. Some participants also seemed to be influenced by both Eastern and Western beliefs. They mentioned the Western concept such as "banana has potassium" and "eggs are high in cholesterol", while incorporating the concepts of traditional Eastern food beliefs.

Religious beliefs can affect food choices and perceptions of health (Shatenstein & Ghadirian, 1998). For instance, Buddhists are forbidden to kill living beings, whilst Judaism and Islam are prohibited to eat pork or pig, of all its parts and its by-products. Similarly, many Seven-Day Adventists are vegetarians, as they believe that flesh of dead animals, shellfish,

cheese, eggs, and butter are better omitted from the ideal diet. Besides religious beliefs, taste seems to be another major concern in determining food choices. In the study conducted by Satia et al. (2000), some Chinese American participants stated that they would eat foods that taste good even though these foods were unhealthy for them. Others would read food labels when buying food items. However, most of the participants had never noticed the food labels and/or could not understand them. Participants obtained nutrition information mainly from Chinese newspapers and magazines, friends, family members, health practitioners, and television. Some believed that "food in the United States is fattening and makes one gain weight", while others stated that "the US lifestyle (eating and sleeping well, but not a lot of physical activity) leads to weight gain" (Satia et al., 2000).

Attitudes from family members, friends, and other social groups are examples of reinforcing factors. Older adults in the household have a stronger preference on the traditional Chinese diet, and have a greater influence on household food consumption patterns than younger individuals. Therefore, Chinese immigrants living with an older adult are more likely to maintain Chinese eating patterns (Chang, 1974; Satia-Abouta, Patterson, Kristal, Teh & Tu, 2002). Also, dietary preferences from a husband or child play a key role in determining what the household will consume. Some women mentioned that "my children prefer American to Chinese foods, and this sometimes affects the whole family's diet", and "I have to prepare what my husband likes to eat" (Satia et al., 2000).

Food quality, convenience, cost and availability are enabling factors, which have been the most important predictors of dietary change among the participants. For instance, some participants consumed more beef, chicken and milk, but less seafoods and vegetables after immigration because they were unable to afford vegetables and fish in the United States, which

are important components of the traditional Chinese diet. Convenience is another concern. Many women believed it was too time-consuming and troublesome to prepare Chinese foods, but they enjoyed the convenience of preparing Western-style breakfasts. They excluded certain traditional Chinese foods in their diet since these foods were not available or were hard to find in the United States (Satia et al., 2000). All these are important factors influencing the degree to which immigrants adopt the dietary practices of the host country.

Quality of Life

In biomedical research, quality of life is an important attribute of clinical investigation and patient care. It reflects on how patients feel and how satisfied they are with treatment, besides the traditional focus on disease outcomes (Higginson & Carr, 2001). Researchers in the social sciences, on the other hand, focus on the social and non-medical aspects of quality of life, which is often used to evaluate and predict outcomes from interventions, and to provide a measure against which resource allocation can be assessed (Rogerson, 1995).

The relationship between nutrition factors and quality of life, however, has received little attention. No empirical research study has been designed to characterize the relationships among factors associated with nutritional status, dietary variables (e.g. a sensory, psychological and social aspects of food and eating) and individuals' quality of life (Amarantos, Martinez & Dwyer, 2001; Drewnowski & Evans, 2001), and none has been conducted to examine how Chinese immigrants perceive their quality of life.

Research Challenges Involving Chinese Populations

The Chinese population in North America has increased substantially in the past few decades (Statistics Canada, 2001). However, only limited data on the dietary intake of this

population are available, particularly at the national level. For example, the Ten State Survey, the NHANES I & II and HHANES Surveys conducted in the United States addressed only the white, black and Hispanic population, but not Asians (Wu-Tso, Yeh & Tam, 1995). Because of the lack of information about population food consumption patterns and nutritional status, many educational initiatives may not be culturally appropriate to target the needs of this specific minority group.

Measuring dietary intake among the Chinese populations is always a significant methodology challenge to many researchers. A lot of Chinese immigrants are linguistically isolated, and therefore, it will be extremely difficult to complete dietary assessment instruments within such populations. Besides, meals are often consumed in mixed dishes, and Chinese people tend to eat from the same serving dish. Participants may have difficulty reporting the intake of individual foods (Lee, Lee, Ladenla, & Miike, 1994b). Also, Chinese do not typically measure food, and they may have difficulty estimating serving sizes or applying the concept of 'servings per day' (Satia-Abouta, Patterson, Kristal, Teh & Tu, 2002). Therefore, even though when the dietary assessment measures have been collected, data may not capture the dietary intakes of these minority subgroups accurately.

Theoretical Framework

Quality of Life Model

One of the major objectives of this study is to assess the quality of life among Chinese-Canadians who follow traditional Chinese dietary habits and health beliefs, and to compare with the quality of life of the hybrid and the more acculturated individuals. Quality of life (QOL) denotes a relatively new concept that has grown more complex over time. Social scientists started to propose the concept in the 1970s and since then there has been a growing interest in

measuring quality of life in medicine, nursing and other health care areas (Sarvimaki, 2000). Currently, there is no single, universally accepted definition of quality of life (Lauer, 1999). As Farquhar (1995) stated this "is a problematic concept as different people value different things". Despite this, there is a wide range of quality of life definitions from health and social science research attempting to quantify and conceptualise this term.

The World Health Organization (WHO) started to develop a unifying and transcultural definition of quality of life. They conceived it as "an individual's perception of his or her position in life, within the cultural context and value systems in which he or she lives, and in relation to his or her goals, expectation, standards, and concerns. It is a broad ranging concept affected in a complex way by the person's physical health, psychological state, level of independence, social relationships, and their relationship to salient features of their environment" (WHO, 1998). In Canada, the Centre for Health Promotion conceptualizes quality of life as "the degree to which a person enjoys the important possibilities of his or her life". Possibilities are referred to as "result from the opportunities and limitations each person has in his/her life and reflect the interaction of personal and environmental factors". Enjoyment is said to have two factors, "the experience of satisfaction or the possession or achievement of some characteristic" (Centre for Health Promotion, 2000).

Many current definitions of quality of life encompass both subjective and objective natures (Ventegodt, Merrick & Andersen, 2003). Subjective QOL focuses on how good a life each individual feels, and how satisfied he or she is with things (i.e., the satisfaction felt by an individual). This is influenced by an individual's previous experiences, mental state, personality, and expectations. Objective QOL, on the other hand, is about how one's life is perceived by the outside world (i.e., the physical object that causes or is related to the satisfaction). This view is

influenced by the culture in which an individual lives, and their ability to adapt to the values of a culture. Examples may be the social status or the status symbols one should have to be a good member of that culture and physical well-being (Ventegodt, Merrick & Andersen, 2003). Some researchers believe that there is an existential core in which the subjective and objective meet, harmonize and is the source of quality of life (Quality of Life Research Centre, 2004; Ventegodt, Merrick & Andersen, 2003).

The WHO focuses on the subjective perspective of quality of life that composes of four key dimensions: physical health (incorporating independence), psychological well-being (incorporating spirituality), social relationships and environment (Power, Bullinger, & Harper, 1999). As shown in Table 2.3, each domain can further be broken down into different facets. The physical health domain includes activities of daily living, dependence on medicines and medical aids, energy and fatigue, mobility, pain and discomfort, sleep and rest, and work capacity. Disease conditions such as chronic pain in arthritis patients will certainly affect their perceived quality of life, taking into account of its impacts on emotional, social and physical functions in daily lives. Because of the impact of disease status on quality of life, a more specific health-related quality of life concept (HRQOL) has been developed in the field of research in recent years, which focuses on the changes in physical and mental dimensions with disease, ageing, functional status, or treatment of these changes (Lauer, 1999).

Table 2.3
Facets and domains of the 26-Item quality of life instrument developed by the World Health Organization (WHOQOL-BREF)

Domain	Facets Incorporated Within Domains
Physical Health	Activities of daily living Dependence on medicinal substances and medical aids Energy and fatigue Mobility Pain and discomfort Sleep and rest Work capacity
Psychological Well-Being	Bodily image and appearance Negative feelings Positive feelings Self-esteem Spirituality/religion/personal beliefs Thinking, learning, memory, concentration
Social Relationships	Personal relationships Social support Sexual activity
Environment	Financial resources Freedom, physical safety and security Health and social care: accessibility and quality Home environment Opportunities for acquiring new information and skills Participation in and opportunities for recreation/leisure activities Physical environment (pollution/noise/traffic/climate) Transport

Psychological domain includes facets that assess positive feelings, body image, self-esteem, thinking, memory, concentration, spirituality, and negative feelings. The social relationship domain includes personal relationships, social support and sexual activity. The environment domain, on the other hand, encompasses facets such as financial resources, freedom, physical's safety and security, health and social care, home environment, opportunities for acquiring new information and skills, opportunities for recreation or leisure activities, physical environment (pollution, noise, traffic or climate), and transport. A longitudinal quality of life study was undertaken among a group of people aged 65 and over living at home in two

different geographical areas of southeast England (inner-city versus a semi-rural community). Results found that social relationships appear to be as valued components of a good quality of life as health status (Fraquhar, 1995). Individuals living in a semi-rural community, Braintree, with low levels of social deprivation rated their quality of life as 'very positive', while those individuals living in Hackney, an inner-city area with high levels of social deprivation (i.e. were socially isolated from family or neighbour support) rated their quality of life very negatively. Of those individuals who responded negatively to their quality of life, some mentioned that it was because of ill health/disability, unhappiness, loneliness and poor financial situation such as not having a good home, or not getting everything they wanted.

These domains and facets described by the WHO have been developed simultaneously and collaboratively in 20 field centres around the world (including 18 developed and developing countries, using 19 languages), made by patients with a range of diseases, by healthy people and by health professionals in a variety of cultures. Focus groups at each field centre were used as a way of socially generating ideas about quality of life, to examine the meaning, variation and perceptual experience of the quality of life construct as judged by the respondents among targeted populations. The instrument (WHOQOL) was rigorously tested to assess its validity and reliability in 20 different international field centres and is currently being tested to assess responsiveness to change. Recent studies indicated that this may be the first definition of quality of life that has directly and formally incorporated cultural components as integral to its definition rather than acknowledging cultural influence as an extraneous variable (Power, Bullinger, & Harper, 1999).

Some researchers, however, have argued that neither the domains nor facets developed by the WHO directly assess food, eating habits, or physical activity issues, which are one of the

major determinants in quality of life (Drenowksi & Evans, 2001; Amarantos, Martinez & Dwyer, 2001). Good nutrition and healthful eating patterns (e.g. consumption of a balanced diet with an emphasis on foods from plant sources) helps improve quality of life by promoting health, preventing dietary deficiency disease, ameliorating or averting secondary malnutrition that is caused by or associated with other disease, and reducing the risk of developing chronic illnesses. For example, the Chinese diets are traditionally lower in fat and higher in complex carbohydrates, which help reduce the risk of cancer and coronary heart disease developments among the Chinese populations (Yu, Harris, Gao, Gao, & Wynder, 1991; Campbell, Parpia, & Chen, 1998; Woo et al., 2001). On the other hand, malnutrition can lead to physical, mental, and social disability. Prolonged nutritional deficiencies may result in under nutrition, decreased in muscle mass and vigour, functional impairment, and decreased HRQOL. It may also cause the lack of enjoyment in eating and anorexia, generating psychological, medical, and social problems. One review study (Gabr, 1987) has reported that children who are inadequately nourished are often apathetic, non-responsive, impulsive, exhibit non-goal-directed behaviour, do not respond normally in social interactions, and have difficulties to cope with stress or frequent daily demands. Evidence also showed that those inadequately nourished adults are likely to develop behaviour patterns similar to those of malnourished children, with impaired working capacity and decreased body weight.

Food can also be a sensory and psychological pleasure to many people. Eating traditional meals may also provide a sense of security and meaning to immigrants, giving them the feelings of independence, control, and sense of mastery over their environment. Also, eating with others may increase social interactions, creating a pleasant eating atmosphere to others. This increases an individual's food consumption, and thereby improves nutritional status. Furthermore, eating

healthily can increase an individual's self-esteem, creating a positive perceived body image and psychological well-being. A qualitative study was conducted to investigate the contributing factors related to appetite among elderly people living in Sweden. The study reported that good mood, positive personal values, wholesomeness, good food quality, nice dinning environment, and having meal fellowship stimulated the appetites and their willingness to eat among these elderly (Wikby & Fagerskiold, 2004). Increasing physical activity is also a viable strategy for improving both health and quality of life of an individual. A recent study has suggested that physical activity may increase self-esteem and positive feelings of an individual, improve the perceived control and mastery over his or her environment, which in turn, may have positive effects on life satisfaction (Rejeski & Mihalko, 2001).

Due to the importance of diet, eating habits, and physical activity, there is a need to assess the dimensions of food and eating when measuring the overall life satisfaction and quality of life (Amarantos, Martinez & Dwyer, 2001; Drewnowski & Evans, 2001; Barr & Schumacher, 2003). Amarantos et al (2001) suggested that experiences associated with dietary behaviours, such as taste, enjoyment, and social aspects of an individual's eating experiences, and the ability to choose his or her own diet should also be taken into account. Some suggestions for potential domains of a diet-related quality of life index are summarized in Table 2.4 (Drewnowski & Evans, 2001). For example, apart from the domains and facets being focused by the WHO, physical health should also include an individual's dietary choices, eating habits, intakes of dietary supplements and medications, and physical activity (e.g. access to food and shopping, or any assistance with eating). Besides, body image, perceived health benefits, and satisfaction with diet quality and fitness should be the measures of psychological well-being. Social interactions and company at meals are important factors in the social relationship domain. Also,

issues related to food security should be considered as a facet incorporating the environment domain.

Table 2.4
Potential domains and content areas for nutrition- and physical activity-related quality of life measures

Domain	Potential Facets	Content Areas
Physical Health	Dietary choices	Low-calorie diet Low-fat diet Low-cholesterol diet Low-sodium diet High-fiber diet
	Eating habits	Medical prescribed diets Meal replacements
	Dietary supplements	Vitamins Minerals Herbals Alternative medicine
	Medications	Diuretics Steroids Polypharmacy
	Physical activity	Assistance with eating Access to food and shopping Walking Exercise program
Psychological Well-Being	Sense of control	Body image Satisfaction with diet quality Satisfaction with appetite Satisfaction with fitness level Perceived health benefits
Social Relationships	Social support	Company at meals
	Marital status	Social interactions
Environment	Financial resources	Food security
	Education	Access to nutrition or dietary information
Life Satisfaction		Satisfaction measures

Immigrants who have a low household income or being unemployed for a long period of time are more likely to experience the issue of food insecurity and/or at risk of hunger. A cross-sectional survey of Latino and Asia immigrants attending primary care clinics or community

centres in California, Texas, and Illinois were assessed with a food security questionnaire (Kasper, Gupta, Tran, Cook & Meyers, 2000). Results showed that the prevalence of hunger resulting from food insecurity among low-income immigrants (i.e., income below federal poverty level) was unacceptably high, with the rate of hunger at 41%, which was more than double the rate found in the general American population of the low income families. Potential consequences of food insecurity include hunger, malnutrition, increase susceptibility to disease, adverse medical outcome for people with chronic illnesses, anxiety and aggression, which in turn, will have negative impacts on health and quality of life (Vailas, Nitzke, Becker & Gast, 1998; Campbell, 1991). Other studies reported a positive association between food insecurity and the prevalence of obesity. Individuals in lower income households tend to spend less money on food and purchase fewer servings of fruits, vegetables and milk products, but more high fat, poor quality foods such as potato chips and soft drinks than those in higher income households (CIHI, 2006, Che & Chen, 2001).

The life satisfaction domain is a measure of how satisfied an individual is with life. A person's assessment of satisfaction with life involves two subjective considerations: how important a given domain is for that person, and how satisfied one is with that domain. An individual can be dissatisfied with a domain that he or she considers to be of relatively little importance, and still maintain an overall satisfactory life quality. However, if one is dissatisfied with a domain of great importance, that person would more likely to perceive a lower overall quality of life (American Thoracic Society, 2004; Ventegodt, Merrick & Andersen, 2003).

Summary

The prevalence of chronic diseases is reaching epidemic levels in developed countries. Many studies reported that Chinese immigrants living in North America have higher incidence of

several chronic diseases, including cardiovascular disease, hypertension, diabetes, obesity, and certain types of cancers than Chinese living in China. Changes in dietary patterns such as adoption of high fat, low fruits and vegetables Western diets, and sedentary lifestyles are believed to be the major contributing factors. This has placed an extra economic burden on the Canadian health care system for the direct costs of hospital care, services of physicians and/or other health professionals, medications, disease management and health promotion programs that target not only on the mainstream Canadians, but also on the minority populations.

Chinese diets are traditionally lower in fat, higher in complex carbohydrates, and moderate in protein content compared to a typical North American diet. The food preference of Chinese are largely based on cultural eating patterns, health beliefs, and the knowledge of TCM that are derived from the Chinese tradition, passed on through experience, word of mouth, or observation. Immigrants in North America may retain certain traditional foods, exclude others, and adopt other non-traditional foods into their diet. The process of dietary acculturation is complex, many factors are involved; such as age, the length of residency in the host country, level of education and income, employment status, having young children at home, ability to speak or read the language of the host country, social contacts with people of the new culture, availability and cost of ethnic foods.

Very few research studies have examined the dietary habits and health beliefs among Chinese immigrants living in Canada, and virtually no research has been done to determine how either of these dietary patterns affecting their quality of life.

METHODS

Subject Selection

Following ethics procedures described in more detail in Section 3.3, participants of Chinese descent living in and around Toronto, Ontario, were recruited from Chinese community groups, organizations, social networks, and churches during February and March 2005. To be eligible for inclusion, participants had to be between the ages of 45 and 64 years, and originated from Mainland China, Hong Kong, or Taiwan. Individuals who were born elsewhere, had diet restrictions due to chronic conditions such as kidney disease, respiratory disease, arthritis, diabetes, coronary heart disease or other related illness, and/or those whose diet were restricted due to religious reasons were excluded from the study.

Probability sampling stratified by regions was used in selecting the Chinese organizations to be involved in the study. A list of all Chinese organizations within the Greater Toronto Area was identified through two Chinese phone directories (Chinese Business Guide, 2003-2004; Chinese Interagency Network of Greater Toronto, 2004). Fifty-one organizations were alphabetically categorized into six regions, and numbers were assigned sequentially (Appendix A). The centers listed first were assigned the number one, followed by two, and so on. Participating organizations were randomly chosen from each region using a random number generation method in Microsoft Excel 2000 (Microsoft Corporation, Redmond, WA, 2000) with a probability of selection proportional to the size of the Chinese population (Appendix B). A total of five organizations were randomly selected: two from the Toronto region; one each from Scarborough, Markham & Richmond Hill, and the North York & Mississauga areas.

A letter of request (Appendix C), which outlined the significance of the research, procedure involved and how the results would be used, was mailed to the Directors of each of the

selected organization to obtain permission for recruiting their members. One week after mailing, these Directors were contacted via telephone or face-to-face meeting to ascertain their willingness to participate in the study, and to address any issues they might have. In the event that the Director refused to have his/her members involved in the study, or if the researcher failed to contact the Director after five attempts, the next organization generated from the list (Appendix B) was used as a replacement.

A total of five organizations expressed interest. They were the Gerrard S.E.A.S. Centre, South Riverdale Community Health Centre, North York S.E.A.S. Centre, Markham Chinese Cultural Centre of Federation of Chinese Canadians in Markham, and the Scarborough Chinese Alliance Church. Potential participants were asked to read the consent form (Appendix D) carefully to understand the purpose of the study, the minimum risk involved, their right to withdraw at anytime and assurance of confidentiality for their information. Individuals who could not read English were given a translated Chinese consent form (Appendix E). This Chinese consent form was translated by the researcher, and submitted for professional reviews (a Research Associate at a research-orientated hospital in Toronto, a Public Health Dietitian, two Chinese language teachers, and two Directors of selected organizations) to ensure that there were no changes in content attributable to translation errors.

All participants received a free copy of the Canada Food Guide to Healthy Eating (both Chinese and English versions), the Health Canada's Physical Activity Guide, and a Thank You Letter (Appendix F & G) to acknowledge appreciation of their participation. In addition, two participants were drawn from a raffle and each of them received a $20 Eaton Centre gift certificate.

Data Collection Instrument

This research study used a cross-sectional survey design to collect information on each participant's dietary habits, health beliefs, and perceived quality of life, and to explore their experience of using Chinese functional foods and attitudes on Western foods. Participants responded verbally to the questionnaire during a 15-20 minute telephone interview conducted by the researcher fluent in their native language (Cantonese or Mandarin). The questionnaire contained five parts. Section I consisted of seventeen statements assessing participants' health beliefs, which was adapted from a review of the literature on dietary beliefs and food practices of Chinese immigrants living in London, England (Chan-Ho, 1985; Tan & Wheeler, 1983), and in America (Satia et al., 2000; Chau, Lee, Tseng & Downes, 1990). Five response options ranged from 'strongly agree' to 'strongly disagree', and were coded so that higher scores corresponded to stronger traditional Chinese health beliefs.

Section II included seven questions about dietary habits. Parts (a) to (g) of question 6 assessed fat-related behaviours using a version of the Fat-Related Diet Habits Questionnaire (DHQ) modified slightly to reflect Chinese eating patterns (Satia et al., 2001a). The development and validation of the Fat-Related Diet Habits Questionnaire has been described elsewhere (Shannon et al., 1997). This seven-item scale assessed dietary behaviours over the past month in connection with selecting diets lower in fat: (i) avoiding added oil in cooking; (ii) avoiding deep-fried foods; (iii) boiling or steaming instead of deep-frying; (iv) trimming visible fats from meat before cooking; (v) replacing high-fat foods with lower-fat alternatives; (vi) avoiding fried foods; (vii) reducing meals consumed at Chinese restaurants. Responses were on a three-point scale (rarely/never, sometimes, always). Fruit and vegetable intake was assessed by indexes (h) through (n) of question six, modified from the Five A Day For Better Health

Approach (Havas et al., 1995). Responses were summed to determine the consumption of the following four food items over the past week: (i) green leafy vegetables, lettuce salad, and other vegetables such as Chinese turnips, watercress, mustard greens, or bitter melon; (ii) potatoes; (iii) fresh fruit juice and fruits; and (iv) tofu. The responses to these two scales were coded such that a higher score reflected more healthful behaviour, that is, lower fat consumption and higher fruit and vegetable intake.

Section III was adapted from a short version of the World Health Organization Quality of Life questionnaire (WHOQOL-BREF) and incorporated the quality of life theoretical framework as discussed earlier. Questions developed by the WHO were based on four main domains: physical health, psychological well-being, social relationships, and environment, as well as two items relating to the overall quality of life and general health. Nutrition and physical activity-related quality of life measures were also included (Drewnoski & Evans, 2001). For example, fitness level (question 22) and satisfaction with appetite (question 21) were added to assess the psychological well-being domain; and question 27 on food security was added to determine the environment domain. 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'. 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. Scores between these values represent the percentage of the total possible score achieved. The raw scores were transformed using the following formula (WHOQOL-BREF, 1996, 1998):

$$\text{Transformed score} = \frac{\text{(actual raw domain score - lowest possible raw domain score)}}{\text{possible raw domain score range}} \times 100$$

Higher scores reflected greater physical, psychological, and social well-beings, and/or higher satisfaction of their physical environment. Moreover, two individually scored items on an individual's perception of overall quality of life and general health were included, with a score range of 1-5. Higher scores denoted higher QOL and better perceived health.

In addition to health belief and dietary assessment information, this survey also addressed the following socio-demographic characteristics in Section IV: age, gender, marital status, years in North America and Western countries, education level, place of birth, city of residence, self-reported English proficiency level, frequency of physical activity, body mass index (BMI), and how participants obtained the primary sources of nutrition information. The question that specifically asked participants regarding their years in North American was referred to as their length of residency in Canada throughout this paper because our participants reported that Canada was the country they directly moved to since immigration. Section V contained two open-ended questions that were used to elicit discussion on the concept of 'food as medicine', the experience of using Chinese foods in the prevention and treatment of a disease, and the attitudes on Western and Chinese foods.

This questionnaire was developed in English, translated into Chinese (Cantonese and Mandarin) by the researcher. Accuracy of the translation content was assessed through reviews and feedback from a Research Associate at a research-orientated hospital in Toronto, a Public Health Dietitian, two Chinese language teachers, and two Directors of selected organizations. Face and content validity were obtained through professional reviews (three Professors at the Department of Applied Human Nutrition) to ensure that the instrument truly measured the behaviour and study objectives. Cronbach's alpha coefficients were used to examine the internal

reliability of the index scales. Overall, each index scale demonstrated a good reliability of the measure with most alpha values above 0.7. Table 3.1 summarizes these alpha coefficients.

Table 3.1
Cronbach's Alpha Internal Consistency Coefficients for Scales Measuring Health Beliefs, Dietary Habits, and Each Quality of Life Domain.

Scale	Number of Items	Cronbach's Alpha
Health Beliefs	17	0.742
Fat-Related Behaviors	7	0.742
Quality of Life Domains:		
Domain 1: Physical Health	6	0.626
Domain 2: Psychological Well-Being	10	0.745
Domain 3: Social Relationship	2	0.802
Domain 4: Environment	9	0.763
General Health	1	N/A
Overall Quality of Life	1	N/A

The questionnaire was pilot tested with 10 Chinese Canadians residing in Toronto, Ontario, who were not selected to participate in the study to ensure validity. Revisions were made based upon the comments received from the pilot test participants to ensure clarity and ease of administration. For instance, a question like "how satisfied are you with your transport?" caused confusion to some participants, and was rephrased to "are you able to find transportation when you need to go for grocery shopping, for medical appointments or to visit friends?" to minimize ambiguity. Questions that assessed food security such as "I worry whether my food will run out before I get money to buy more," and "we eat the same thing several days in a row because we don't have money to buy different varieties of foods", were rephrased to "I have enough money to meet the needs of day-to-day life", and "I never worry about not having enough money to buy foods", respectively. In addition, the response options for marital status and place of residency were expanded.

Ethical Issues

A letter of request was sent to each selected organization to obtain permission before recruiting their members. Participants were informed about the potential benefits of the study, that their participation was entirely voluntary, that all information provided was confidential and that they were free to withdraw at any time. Written informed consent was obtained as per Appendix D. Participants were advised not to put any identifying information such as their names and phone numbers anywhere on the questionnaire of which individuals completed the telephone interview. Data obtained from the telephone interview was entered into a database and thereafter it was identified by study ID number only. All completed questionnaires and consent forms are kept in the strictest confidential manner by storing in a locked filing cabinet at the researcher's home office. Within 30 days of the completion of the thesis, all completed questionnaires, consent forms, and any other identifying documents will be destroyed by the researcher in a secure manner.

The ethical issues of this research were approved by the University Ethics Review Board at the Mount Saint Vincent University from the period of February 2005 to January 2006, and were further renewed from January 2006 to December 2006.

Data Analysis

All data were coded and entered into Microsoft Excel 2000, and analyzed through SPSS statistical software (13.0 for Windows, SPSS Inc, Chicago, IL). Descriptive statistics and frequency distribution were performed on all data to characterize the study population. Means (*M*) and standard deviations (*SD*) were calculated for interval variables, including the total health belief and fat related behavior scores, frequency of fruit and vegetable consumptions, the quality of life domain scores and body mass index. One-way analysis of variance (ANOVA) and

independent samples *t*-tests (two-tailed) were used to test for significant differences in the mean values of quality of life domains, general health, overall quality of life assessment, total traditional health belief scores, and dietary scale scores on various demographic variables. In case of a significant *F*-statistic, post-hoc comparisons were performed with Scheffe test (which controls the experiment-wise Type 1 error rate), to assess which groups differed significantly from each other. The Kruskal-Wallis test was used to test for significant differences when the response variable was measured on an ordinal-scale. A non-parametric χ^2 test was used to test for significant associations among categorical variables. The level of significance was set at $p \leq 0.05$ for all statistical tests.

Simple and multiple regression analyses were conducted to examine the relationship among general health and perceived quality of life with the four quality of life domains. Pearson product-moment correlation coefficient (r) measured among continuous variables and Spearman product-moment correlation test were used to test for relationships between ordinal variables.

Responses from the two open-ended questions in Section V were recorded and translated into English. Accuracy of translation was further assessed by two Chinese language teachers who were also proficient in English. Themes that recurred in the data were identified by sorting the responses from each question into their corresponding categories or subcategories. Abbreviated codes of a few letters were assigned next to each common theme. Categories continued to be created until no new themes or subcategories were identified. Analysis was done by entering all narrative data into the Microsoft Excel to determine the patterns and relationships of responses from all the respondents for each theme.

Budget

The majority of expenses incurred during data collection process consisted of administrative costs. Funding was needed for travelling to the recruitment centres for subject selections, and for photocopying questionnaires and consent forms. Postage was also required for mailing letters to the Directors of the selected organizations. Participants received a copy of the Canada's Food Guide to Healthy Eating (both Chinese and English versions), the Health Canada's Physical Activity Guide and a Thank You Letter by mail. Two participants were selected in a raffle and each of them received a $20 Eaton Centre gift certificate ($40 in total).

RESULTS

Characteristics of Participants

One hundred and eighty-two subjects were initially approached. Of these, 145 subjects (80%) agreed to participate in the study and returned the signed consent form to the researcher. Twenty-nine (20%) of the 145 subjects had to be excluded from the analysis because they did not meet all the eligibility criteria. Ten subjects (7%) were classified as "non-responders" after five attempts of telephone contacts were made. The final study population for analysis was 106.

Table 4.1 summarizes the demographic characteristics of participants. Ages ranged from 45 to 64 years, 73% were female and 93% were married. They originated from Mainland China, Hong Kong, and Taiwan; and 62% had been in Canada (and Western countries) for more than 10 years. There was a range of education levels and 58% reported fair English language proficiency. Body mass index ranged from 15.6 to 31.4 kg/m^2 with a mean of 21.8 ± 2.5 kg/m^2.

Table 4.1
Demographic Characteristics of Participants (N=106)

		%
Gender	Male	27.35
	Female	72.64
Age (y)	45-49	34.91
	50-54	24.53
	55-59	25.47
	60-64	15.09
Marital Status	Married	93.40
	Never Married	2.83
	Divorced	2.83
	Widowed	0.94
Education	< 8 yrs	0.94
	8-11 yrs	10.38
	High School	32.08
	Vocational school	2.83
	Some College	21.70
	University or above	32.08
English Proficiency	Poor	14.15
	Fair	57.55
	Good	22.64
	Excellent	5.66
Living Area	Downtown Toronto	1.89
	East York	4.72
	Markham	24.53
	Scarborough	14.15
	North York	30.19
	Richmond Hill	16.04
	Thornhill	6.60
	Vaughan	0.94
	Unionville	0.94
Place of Birth	Mainland China	37.74
	Hong Kong	56.60
	Taiwan	5.66
Years in Canada and \Western Countries	0-5 yrs	11.32
	6-10 yrs	26.42
	11-15 yrs	23.58
	>15 yrs	38.68
BMI (kg/m^2)	18.5 or less	5.66
	18.6-23.9	81.13
	24.0-27.9	11.32
	≥ 28.0	1.89

Research Objectives

This section will summarize the findings as per research objectives.

Objective # 1: To identify dietary habits, health beliefs, and perceived quality of life among Chinese-Canadians living in Toronto.

Dietary Habits

Participants' Dietary Patterns

Most of the subjects (85%) consumed three meals a day and 62% snacked between meals by selecting fresh fruits and crackers most often. Sixty-seven percent of subjects reported consuming a Western style breakfast such as milk and cereal, oatmeal, or bagel with cream cheese, and one eighth (12%) reported skipping breakfasts. Among all participants, 72% of them consumed a Chinese-style lunch such as rice with stir-fry, noodles, or soup, and almost all subjects (98%) consumed a traditional Chinese dinner.

Participants were asked to provide their perception of the healthfulness of their overall diet. Majority (90%) indicated that they purposefully adapted a healthy eating habit or had at least tried to eat healthily by choosing nutritious foods more often.

Fat-Related Behaviors

The average scores for the seven categories of behavior related to selecting reduced fat diet are listed in Table 4.2. The data indicated that participants, as a whole, tended to reduce their dietary fat intake by using less oil in cooking, reducing the consumption of deep-fried foods, preparing foods by boiling instead of deep-frying, trimming visible fat from meat before cooking, substituting specially manufactured lower-fat alternatives for their higher-fat counterparts, and avoid eating fried foods. To a lesser extent, these participants did not frequently reduce meals consumed at Chinese restaurants.

Table 4.2
Fat-Related Behavior Scores among Chinese-Canadian Participants (N=106)

Fat-Related Behaviors	M ± SD	Median
Reducing the amount of added oil in cooking	2.70 ± 0.55	3.00
Decreasing the consumption of deep-fried foods	2.70 ± 0.54	3.00
Preparing foods by boiling or steaming instead of deep-frying	2.65 ± 0.59	3.00
Trimming visible fats from meat	2.74 ± 0.54	3.00
Substituting specially manufactured low-fat foods for their higher-fat counterparts	2.67 ± 0.60	3.00
Avoid eating fried foods	2.62 ± 0.51	3.00
Reducing meals consumed at Chinese restaurants	2.34 ± 0.65	2.00

(1 = Rarely or Never; 2 = Sometimes; 3 = Always)

Fruits & Vegetables Intakes

The average intakes of fruits and vegetables per week are listed in Table 4.3. Participants regularly consumed green leafy vegetables such as bok choy and gai lan, other vegetables such as Chinese turnips, watercress, mustard green or bitter melon every week. Fruits were commonly eaten by our participants, with an average intake of 5.6 times a week; whereas fruit juice of only 2.6 times per week. Potatoes and tofu were less frequently consumed, with average consumptions of once and twice a week, respectively.

Table 4.3
Average Consumption of Fruits and Vegetables per Week (N=106)

Fruits and Vegetables	Intakes Per Week M ± SD
Green Leafy Vegetables	5.52 ± 1.11
Other Vegetables (e.g. Chinese turnips, watercress, mustard greens, or bitter melon)	2.67 ± 1.97
Lettuce Salad	1.04 ± 1.30
Potato, including boiled, baked or mashed	1.34 ± 1.43
Fresh Fruit Juice	2.63 ± 2.21
Fruits, including fresh, canned and/or frozen)	5.64 ± 1.05
Tofu	2.10 ± 1.69

Traditional Health Beliefs

Descriptive Statistics

Table 4.4 indicates the percentage distributions of subjects by the scores for each 17 statements. Each statement was coded so that higher scores corresponded to stronger traditional Chinese health beliefs. Results shows that more than half of the subjects (60%) preferred to eat Chinese foods than Western foods, and 44% thought that a traditional Chinese diet is healthier than the typical Western diet. Seventy-three percent of the subjects believed, and 63% practiced, the concept of balancing 'hot' and 'cold' (or *Yin* and *Yang*) foods to maintain good health.

All participants agreed that healthy eating means no overeating and under eating. More than 80% believed in the basic principles of foods to be used as tonics to prevent disease and maintain good health, and as medicines to correct imbalances that have led to disease states and to facilitate recovery. They also believed that some foods can cause irritating reactions to the body and were tabooed. However, not all participants held all traditional health beliefs. About 67% agreed with the functions of *Yin* or 'cold' foods to help get rid of extra internal body heat, but less than half of them believed that *Yang* or 'hot' foods can lead to higher energy level.

Table 4.4

Percentage Distribution of Scores among Participants for Traditional Chinese Health Beliefs (N=106)

Health Beliefs	Score (%)				
	1	2	3	4	5
1. I prefer to eat Western foods to Chinese foods.[1]	0.94	4.72	33.96	55.66	4.72
2. Western foods are, in general, less healthy than Chinese foods.[2]	0	14.15	41.51	40.57	3.77
3. I do not practice the balance of 'hot' and 'cold' (or yin and yang) foods in meals.[1]	0.94	16.98	18.87	58.49	4.72
4. An elderly person's body becomes "colder" and more prone to "cold" diseases.[2]	0	15.09	28.30	50.00	6.60
5. It is important to combine 'hot' and 'cold' foods for good health.[2]	0	3.77	23.58	62.26	10.38
6. Eating *yang* foods leads to higher energy level.[2]	0.94	11.32	42.45	41.51	3.77
7. *Yin* foods help get rid of extra internal body heat.[2]	0	7.55	25.47	61.32	5.66
8. Eating fried and greasy foods can cause cancer and heart disease.[2]	0	4.72	11.32	52.83	31.13
9. Healthy eating means eating 3 simple, regular meals with no snacks.[2]	0.94	25.47	15.09	51.89	6.60
10. Healthy eating also means no overeating and undereating.[2]	0	0	0	76.42	23.58
11. Suitable foods should be consumed during or after illness to facilitate recovery.[2]	0	0	1.89	69.81	28.30
12. Seasonal adjustment of diet is important for health maintenance.[2]	0	3.77	13.21	66.04	16.98
13. Some foods can cause 'wet', 'irritating' or' poisonous' reactions to the body.[2]	0	2.83	10.38	78.30	8.49
14. It is important to adjust food intake (*yin* and *yang* foods) to suit body constitution.[2]	0	0	14.15	74.53	11.32
15. Proper use of tonic can prevent illness.[2]	0	4.72	21.70	65.09	8.49
16. Some foods and herbs can counter the debilitating side effects of prescription drugs.[2]	0.94	0.94	37.74	54.72	5.66
17. Food can influence a person's temperament.[2]	0	8.49	37.74	49.06	4.72

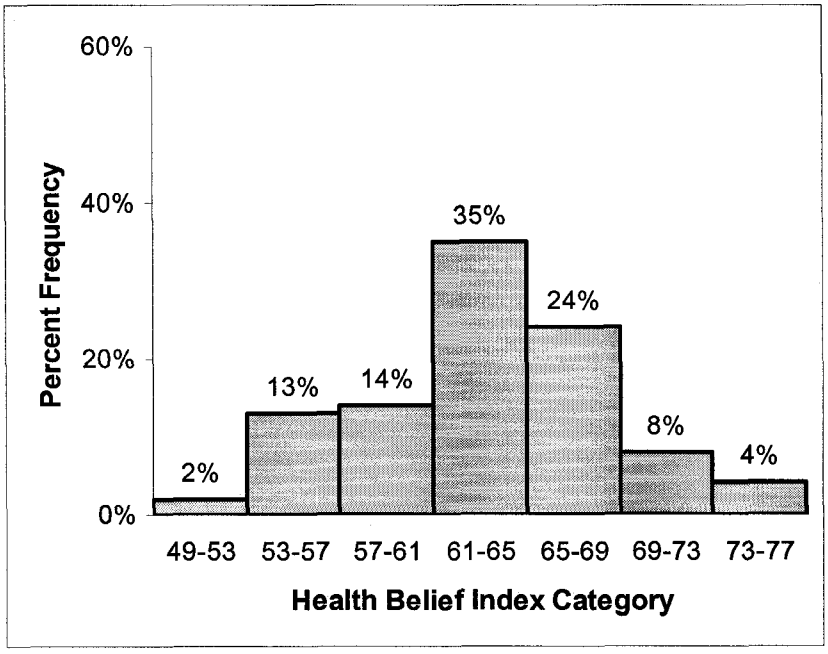
[1] Scale 1= Strongly Agree; 2= Agree; 3= Neither Agree Nor Disagree; 4= Disagree; 5= Strongly Disagree

[2] Scale 2= Strongly Disagree; 2= Disagree; 3= Neither Agree Nor Disagree; 4= Agree; 5= Strongly Agree

Traditional Health Belief Index

Responses to these 17 statements were summed to create a health belief index score theoretically ranging from 17 to 85. Higher total health belief scores denoted stronger level of traditional Chinese health beliefs. The frequency distribution of the total health belief scores came close to a normal distribution ($M = 63.44 \pm 5.28$, Skewness = 0.043, Kurtosis = -0.112, N = 106). Figure 1 displays the histogram. In general, the health belief scores were evenly distributed among our study population. About 29% of the subjects scored below the average range of 61 to 65 who were least likely to hold traditional Chinese health beliefs. On the other hand, 36% of participants scored above the average range, indicating strong traditional Chinese health beliefs. Thirty-five percent of them had average scores indicating moderate beliefs.

Figure 1
Frequency Distribution of Health Belief Index



Traditional Health Belief Grouping

Based on the total scores obtained from the health belief index (Figure 1), the samples were re-categorized into three groups to assess different degrees of traditional Chinese health beliefs (THB) among the study participants: 1) THB-Weak (scores 61 or less): these were the individuals who did not believe in the concept of balancing 'hot' and 'cold' foods in meals; 2) THB-Moderate (scores between 62 and 65): those who might not fully believe in the concept but accept some of its theories; and 3) THB-Strong (scores from 66 and over): those who had strong beliefs in the traditional Chinese health concept. As a result, 32 subjects were grouped into THB-Weak, 37 in THB-Moderate, and 37 in THB-Strong.

This grouping was consistent with participants' self-categorization according to Question 3 "I do not practice the balance of 'hot' and 'cold' foods in meals" and Question 5 "it is important to combine 'hot' and 'cold' foods for good health" of Section 1. Question 5 determined whether participants believed in the concept of balancing *Yin* and *Yang* foods in meals, whereas Question 3 further confirmed if they actually practiced such a belief. Figures 2 (i) and (ii) listed the frequency distributions of THB groups in each response option of Questions 3 and 5. A *Chi-square* test of goodness-of-fit was performed to determine whether the groups were equally distributed in Questions 3 and 5. For THB groups versus Question 3, *Chi-square*(8, N=106) = 41.64, $p<0.001$, and for THB groups versus Question 5, *Chi-Square*(6, N=106) = 30.75, $p<0.001$. Results show that significantly more individuals who were grouped as having the strongest traditional health beliefs (THB-Strong) agreed with importance of balancing the 'hot' and 'cold' foods for good health, and would practice such health beliefs in meals compared to those who were grouped as having moderate or weak traditional Chinese health beliefs.

Figure 2(i)

Validation to Traditional Health Belief Groups by Question 3 "I do not practice the balance of 'hot' and 'cold' (or Yin and Yang) foods in meals"

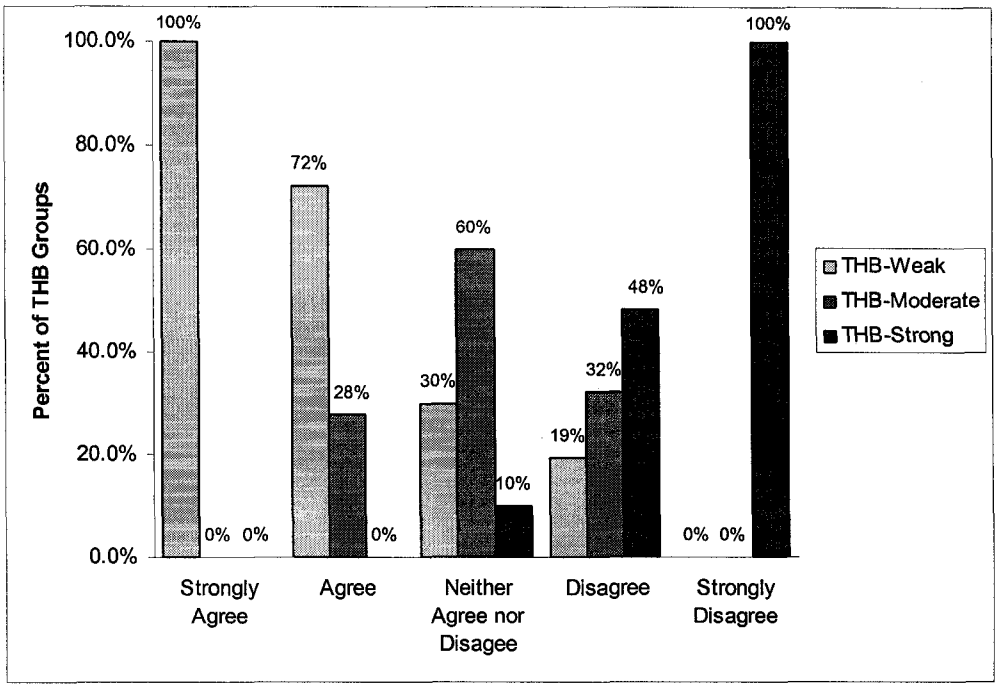
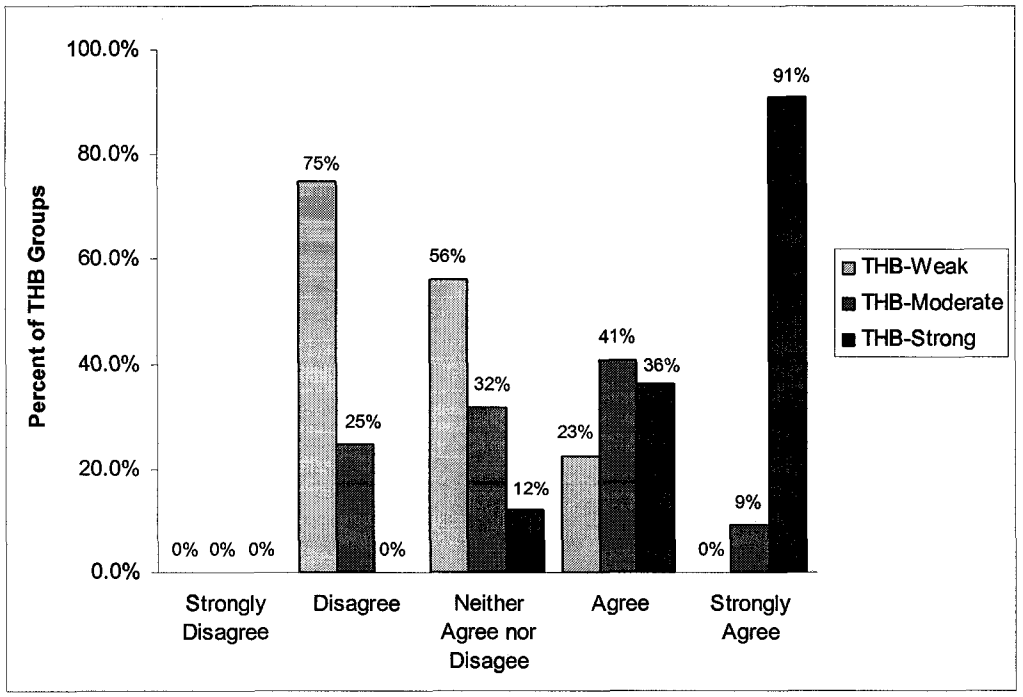


Figure 2(ii)

Validation to Traditional Health Belief Groups by Question 5 "It is important to combine hot and cold foods for good health"



Overall Quality Of Life

The 29 items on the WHOQOL-BREF questionnaire were broadly grouped into four domains: physical health (individuals' perception of their physical state, 6 items), psychological well-being (individuals' perception of their cognitive and affective state, 10 items), social relationships (individuals' perception of the interpersonal relationships and social roles in their life, 2 items), and environmental issues (individuals' perception of their surrounding environment, 9 items); and two individually scored items to address overall quality of life and general health. Higher scores on each facet reflected a better quality of life. Table 4.5 describes the minimum, maximum, mean, and standard deviation of these observed responses.

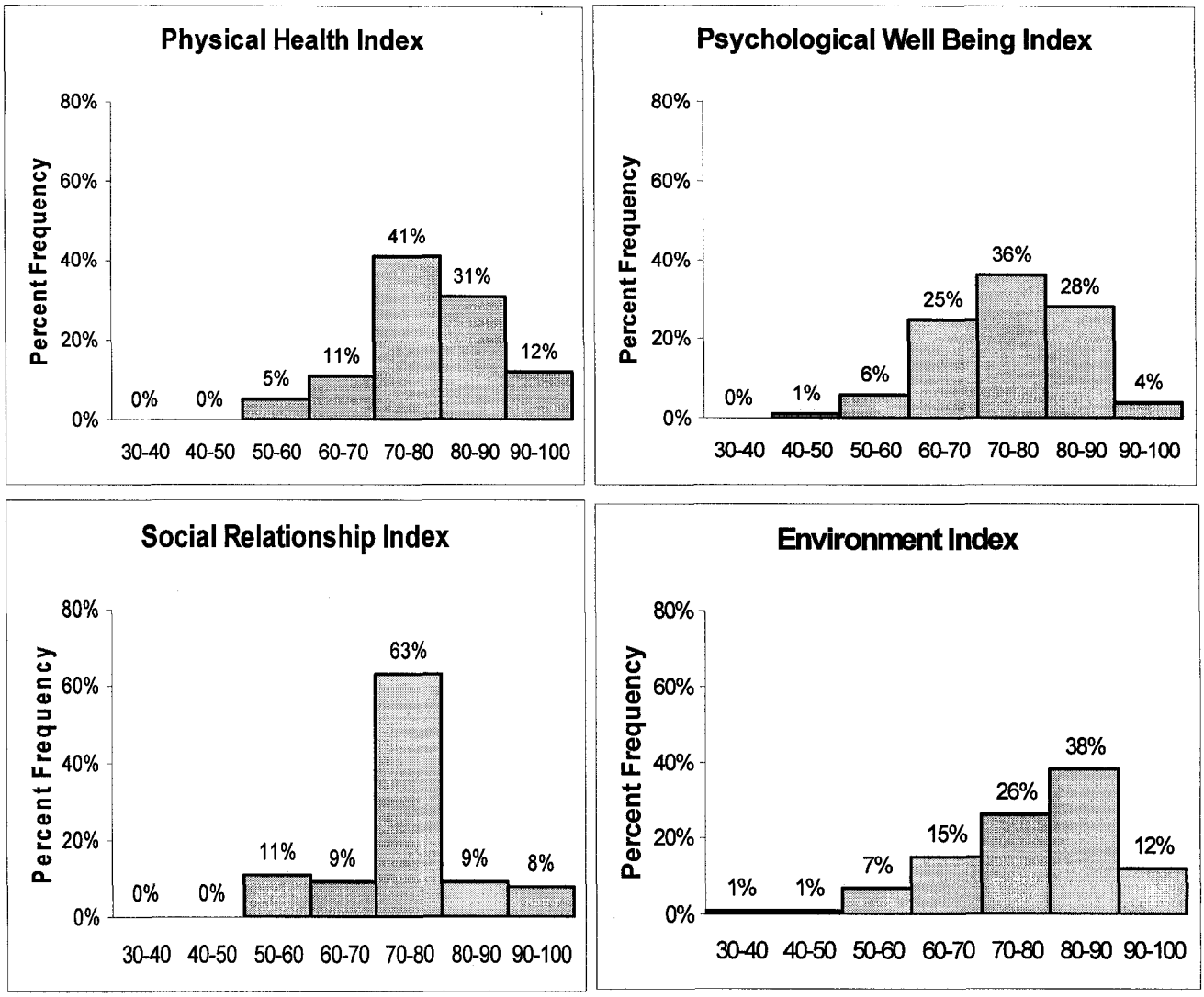
Table 4.5
Descriptive Statistics on Quality of Life Domains and Life Satisfaction Measures

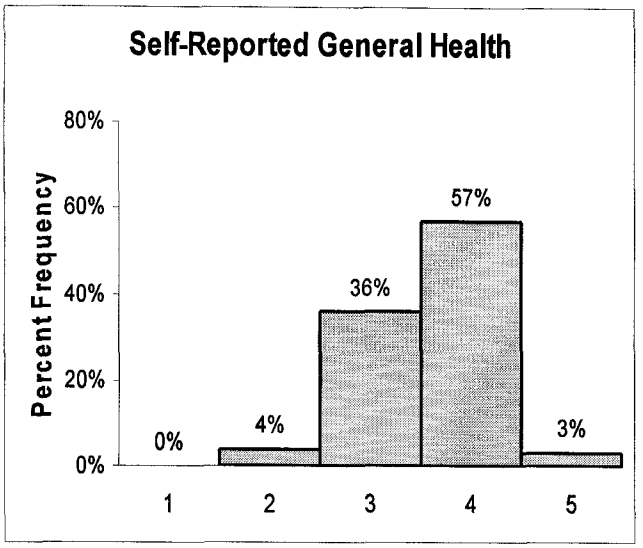
Domains	Number of Items	Range of Possible Responses	Min	Max	Mean	SD
1. Physical Health	6	0-100	54.17	100.00	78.62	10.27
2. Psychological Well-Being	10	0-100	42.50	97.50	73.82	9.99
3. Social Relationship	2	0-100	50.00	100.00	74.06	12.16
4. Environment	9	0-100	38.89	94.44	77.33	11.49
General Health	1	1-5	2	5	3.59	0.61
Overall Quality of Life	1	1-5	3	5	3.92	0.63

The frequency distributions of each domain, general health and overall quality of life are displayed in Figure 3. The four domains have all or almost all the scores contained in the upper half of the range of possible values. Three of the domains were fairly normally distributed, but the fourth domain, Environment, was positively skewed, with 50% of respondents scoring above 80%. Self-reported General Health ranged from 2 to 5, with over 90% of respondents scoring at 3 to 5. Overall Quality of Life also had a narrow response range, from 3 to 5. This may partially

be a result of excluding people with certain medical conditions or chronic illnesses from the study.

Figure 3
Histograms of Each QOL Domain, General Health and Overall Perceived QOL





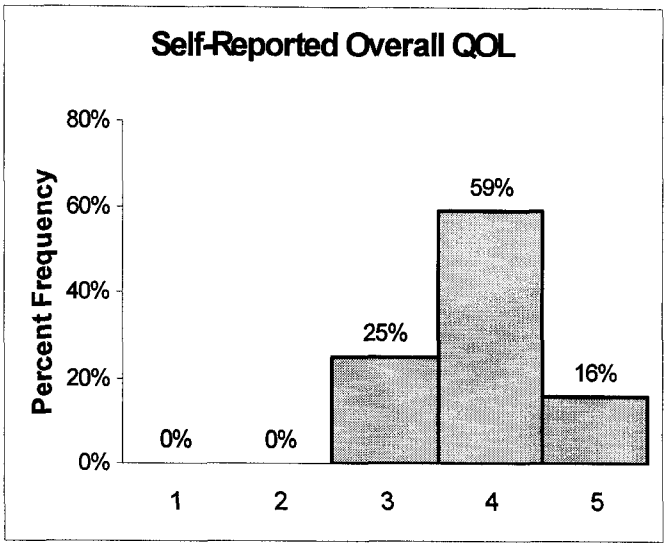


Table 4.6 listed the percentages of participants' responses in each of the 29 quality of life index. The majority of responses were distributed in the upper ends of the scales, indicating that a substantial number of participants reported themselves healthy and happy, had good perceived physical health, psychological well-being, social relationships, and environmental quality of life.

Table 4.6
Frequency Responses (%) for Quality of Life Items/Domains (N = 106)

Scale Points/ Domains and Facets	1 Poor QOL	2	3	4	5 Good QOL
Average Total Responses	0.06	2.70	19.81	49.71	27.72
1. Physical Health Domain:					
Q2. Pain and discomfort	0	1.89	11.32	29.25	57.55
Q3. Mobility	0	0	3.77	16.98	79.25
Q9. Energy and fatigue	0	0	20.75	43.40	35.85
Q12. Sleep and rest	0.94	9.43	30.19	43.40	16.04
Q13. Activities of daily living	0	0.94	15.09	66.98	16.98
Q14. Working capacity	0	0	22.64	65.09	12.26
2. Psychological Well-Being Domain:					
Q4. Positive feelings	0.94	4.72	22.64	28.30	43.40
Q5. Spirituality, religion and personal beliefs	0	3.77	23.58	27.36	45.28
Q6. Thinking, learning, memory, concentration	0	3.77	15.09	42.45	38.68
Q15. Self-esteem	0	0.94	16.98	70.75	11.32
Q21. Satisfaction with appetite	0	0	9.43	70.75	19.81
Q22. Fitness level	0	2.83	31.13	57.55	8.49

Q23. Body image	0	2.83	37.74	53.77	5.66
Q24. Negative feelings	0	2.83	33.83	35.85	27.36
Q25. Satisfaction with food Quality	0	0	16.98	64.15	18.87
Q26. Satisfaction with food Taste	0	0	21.70	68.87	9.43
3. Social Relationships Domain:					
Q16. Personal relationships	0	0	18.87	68.87	12.26
Q17. Practical social support	0	0	13.21	74.53	12.26
4. Environment Domain:					
Q7. Physical safety & security	0	3.77	16.04	26.42	53.77
Q8. Physical environment	0	1.89	16.98	30.19	50.94
Q27. Financial resources	0	0.94	16.04	65.09	17.92
Q11. Information and skills	0	10.38	24.53	36.79	28.30
Q10. Recreation and leisure	0	11.32	16.04	31.13	41.51
Q18. Home environment	0	0.94	7.55	73.58	17.92
Q19. Access to health and social care	0	6.60	33.02	52.83	7.55
Q20. Transport	0	1.89	3.77	20.75	73.58
Q28. Food security	0	2.83	15.09	59.43	22.64
General health (Q1)	0	3.77	35.85	57.55	2.83
Overall QOL (Q29)	0	0	24.53	59.43	16.04

Regression analysis is a commonly performed to determine the association between a response variable and one or more predictor variables, and to make predictions based on the linear relationship. In this study, we used simple linear regressions to examine the relationships of general health and overall assessment of quality of life with the four QOL domains, and to find out whether we can estimate a person's overall QOL and general health based on any one of these domains. Results are shown in Tables 4.7 and 4.8. For example, it was found that Physical Health was significantly ($t(104) = 3.612$, $p < 0.001$) related to overall QOL. The slope of the relationship was 0.021. This is the predicted increase in overall QOL per unit increase in physical health domain scores. The $r^2 = 0.111$ indicates that the model explains 11% of the variation in the respondents' perceived QOL. Similar relationships were found between overall QOL and psychological well-being and environment; and between general health and physical health, psychological well-being and social relationships.

Results of these simple regression models showed that overall quality of life can be predicted based on participants' perception of their physical state, psychological well-being, and environmental conditions, but not on their social relationships. Similarly, general health can be predicted based on physical health, psychological well-being, and social relationships, but not on environmental conditions. Although the *r*-values were significant in these regression models, the relationship between each of the domains and the overall QOL and general health were not very strong. Therefore, it is anticipated that if one predicted the overall QOL and general health from any one of these QOL domains, there might be fairly large margins of error with the predictions. We attempted to use multiple regressions to predict overall QOL using these four QOL index variables. However, no multi-linear relationships were found. In the multiple regression model of general health, physical health ($t(103) = 3.367$, $p = 0.001$) and social relationships ($t(103) = 2.376$, $p = 0.019$) were the predictors that remained significant in the final step of the stepwise regression analysis. These variables accounted for 20% of the variation in participants' perceived general health. The slopes of physical health and social relationship were 0.019 and 0.011, respectively. The Spearman product-moment correlation test indicated a significant relationship between general health and overall QOL, r (104) = 0.247, $p < 0.05$ (two-tailed), meaning that people who perceived themselves as healthy were also more satisfied with their lives.

Table 4.7
Linear Regression Models of Overall Quality of Life on the Four QOL Domains

Dependent Variable	Independent Variables	R^2	t	Degree of Freedom	Slope	Significance Levels
Overall QOL	Model 1: Physical Health	0.111	3.612	104	0.021	< 0.001
	Model 2: Psychological Well-Being	0.101	3.427	104	0.020	0.001
	Model 3: Social Relationships	0.025	1.645	104	0.008	0.103
	Model 4: Environment	0.242	5.766	104	0.027	< 0.001

Table 4.8
Linear Regression Models of General Health on the Four QOL Domains

Dependent Variable	Independent Variables	R^2	t	Degree of Freedom	Slope	Significance Levels
General Health	Model 1: Physical Health	0.154	4.349	104	0.023	< 0.001
	Model 2: Psychological Well-Being	0.147	4.233	104	0.024	< 0.001
	Model 3: Social Relationships	0.110	3.577	104	0.017	0.001
	Model 4: Environment	0.009	0.965	104	0.005	0.337

Objective # 2: To determine the differences in food selection and preparation among participants with varying degrees of traditional Chinese health beliefs.

Fat-Related Behaviors

Table 4.9 indicates the fat-related behavior scores related to the THB groups. Using one-way Analysis of Variance, no significant differences were found between the average total fat-related behavior scores (sum of all seven fat behavior items) of the traditional health belief groups, ($F(2,103) = 0.69$, $p = 0.50$). However, some interesting results were noted on two fat-related behavior items (Figure 4). Using the Kruskal Wallis test, significant differences were found between the rank-average frequencies of reducing the amount of added oil in cooking of the THB-groups, (*Chi-Square*(2) $=7.50$, $p = 0.023$). Participants who have strong traditional health beliefs, indicated a lower average frequency of reducing the amount of cooking oil ($M = 2.49 \pm 0.69$) than in the THB-Moderate group ($M = 2.84 \pm 0.37$) perhaps indicating that participants in the THB-Strong group practiced traditional Chinese cooking methods whereby they cook with lots of oil. The differences between the rank-average frequencies of the practice of trimming visible fats from meat between subjects in the THB-Moderate ($M = 2.89 \pm 0.32$) and –Strong ($M = 2.59 \pm 0.69$) groups approached significance (*Chi-Square*(2) = 4.64, $p = 0.098$).

No significant differences were found in the rank-average frequencies of behaviors such as 'decrease the consumption of deep-fried foods' (*Chi-Square*(2) = 0.19, p = 0.91), 'prepare foods by boiling or steaming instead of deep-frying' (*Chi-Square*(2) = 0.75, p = 0.69), 'substitute low-fat alternatives for high-fat food'(*Chi-Square*(2) = 3.26, p = 0.20), 'avoid eating fried foods' (*Chi-Square*(2) = 1.66, p = 0.44), and 'reduce the consumption of meals at Chinese restaurants' (*Chi-Square*(2) = 1.77, p = 0.41) among any of the THB groups.

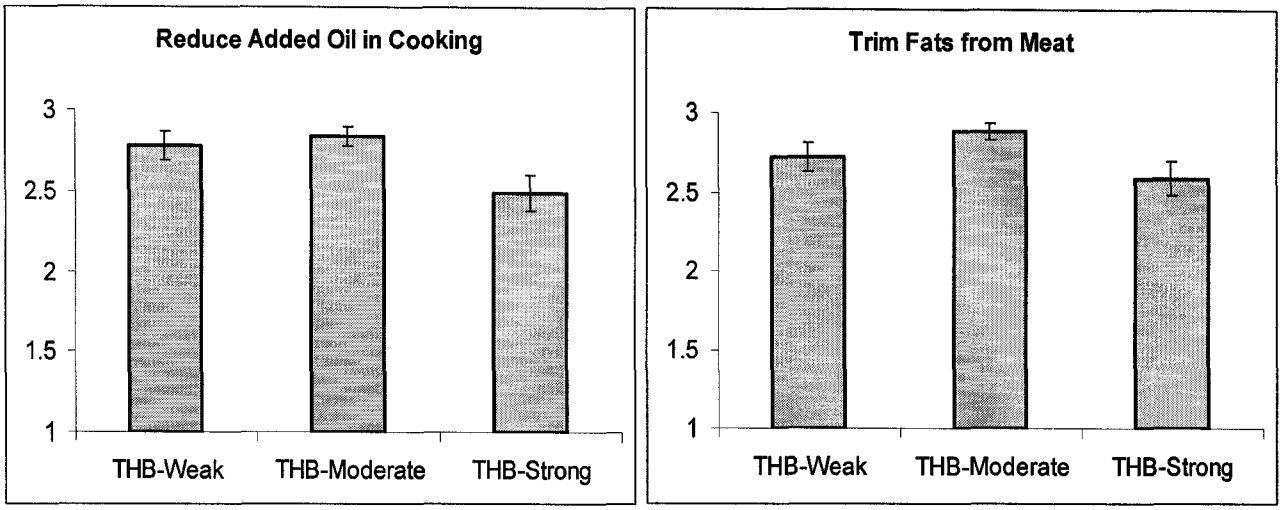
Although not statistically significant, individuals in THB-Strong group, on average, more frequently had lower consumption of deep-fried foods, substituted lower fat foods for their higher fat counterparts, avoided eating fried foods, and reduced consumption of meals at Chinese restaurants than those who had THB-Moderate or -Weak.

Table 4.9
Fat Related Behavior Scores (M ± SD) by Traditional Health Belief Groups

Fat-Related Behaviors	THB-Weak	THB-Moderate	THB-Strong
	M ± SD	M ± SD	M ± SD
Average Total Scores	2.58 ± 0.61	2.68 ± 0.48	2.62 ± 0.58
a. Reducing the amount of added oil in cooking	2.78 ± 0.49	2.84 ± 0.37	2.49 ± 0.69
b. Decreasing the consumption of deep-fried foods	2.66 ± 0.60	2.70 ± 0.52	2.73 ± 0.51
c. Preparing foods by boiling or steaming instead of deep-frying	2.69 ± 0.64	2.65 ± 0.54	2.62 ± 0.59
d. Trimming visible fats from meat	2.72 ± 0.52	2.89 ± 0.32	2.59 ± 0.69
e. Substituting specially manufactured low-fat foods for their higher-fat counterparts	2.50 ± 0.72	2.73 ± 0.56	2.76 ± 0.50
f. Avoid eating fried foods	2.53 ± 0.57	2.62 ± 0.49	2.70 ± 0.46
g. Reducing consumptions of meals at the Chinese restaurants	2.22 ± 0.71	2.35 ± 0.59	2.43 ± 0.65

Figure 4

Fat Related Behavior Scores (M ± SE) by Traditional Health Belief Groups (Score Range 1-3)



Fruits and Vegetables Intakes

The average weekly intakes of fruits and vegetables among these Chinese Canadian participants with different degrees of traditional health beliefs are listed in Table 4.10. Using one-way Analysis of Variance, no significant associations were found between the mean consumption frequency of fruits and vegetables of the traditional health belief groups, including green leafy vegetables ($F(2,103) = 0.17$, $p = 0.84$), lettuce salad ($F(2,103) = 0.27$, $p = 0.76$), bitter melon, Chinese turnips, watercress ($F(2,103) = 0.91$, $p = 0.41$), fruits ($F(2,103) = 0.47$, $p = 0.63$), fruit juice ($F(2,103) = 0.10$, $p = 0.91$), potatoes ($F(2,103) = 1.32$, $p = 0.27$), and tofu ($F(2,103) = 0.53$, $p = 0.59$).

Table 4.10
Average Weekly Fruit and Vegetable Intakes (M+SD) by Traditional Health Belief Groups

Fruit and Vegetable Intakes per Week	THB-Weak	THB-Moderate	THB-Strong
	M ± SD	M ± SD	M ± SD
Average of all Vegetable Intakes	3.04 ± 0.16	3.00 ± 0.17	3.19 ± 0.16
Green Leafy Vegetables	5.44 ± 0.21	5.59 ± 0.17	5.51 ± 0.18
Other Vegetables (e.g. Chinese turnips, watercress, mustard greens, or bitter melon)	2.80 ± 0.36	2.34 ± 0.33	2.89 ± 0.31
Lettuce Salad	0.89 ± 0.16	1.05 ± 0.21	1.15 ± 0.27
Average of all Fruit Intakes	4.14 ± 0.23	4.25 ± 0.20	4.01 ± 0.20
Fresh Fruit Juice	2.64 ± 0.38	2.74 ± 0.39	2.50 ± 0.36
Fruits, including fresh, canned and/or frozen	5.64 ± 0.21	5.76 ± 0.14	5.51 ± 0.18
Average Potato Intakes	1.08 ± 0.26	1.59 ± 0.23	1.32 ± 0.23
Average Tofu Intakes	2.34 ± 0.30	1.96 ± 0.28	2.03 ± 0.28

Objective # 3: To determine how demographic and nutrition related factors such as dietary habits, health beliefs, degree of acculturation, age, and education levels influence participants' perceived quality of life.

One-way ANOVA analyses and independent samples *t*-tests were conducted to compare participants' overall perceived quality of life, general health and the four QOL domains grouped on each of the demographic variables (e.g. age, gender, marital status, place of birth, educational attainment, length of time in Canada and Western countries, English proficiency, BMI, the presence of young children in the household, and frequency of physical activities), traditional health belief groups, and dietary behaviors (including the fat-related behaviors, consumption frequency of fruits and vegetables).

For better comparisons, sociodemographic factors such as marital status were recoded into a dichotomy of married and not married; educational attainment was recoded into low (11 years or below), intermediate (high school level or vocational school), and high (college degree or above); and BMI was grouped into four categories (underweight: <18.5, normal range: 18.5-

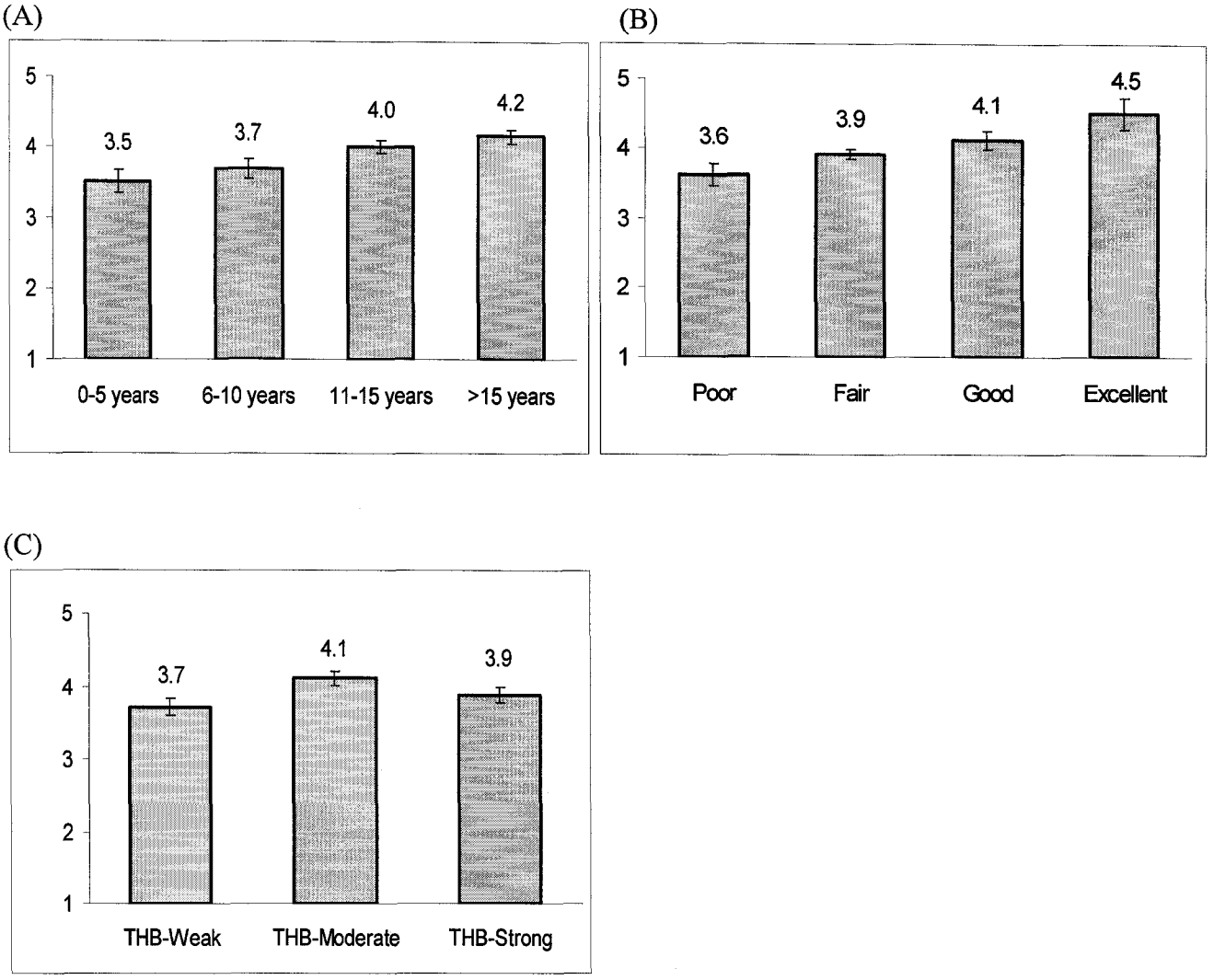
23.9, overweight: 24-27.9, and obese: 28 or above) based on the recommended cut-off points for Asians (Wildman, Gu, Reynolds, Duan, & He, 2004; Deurenberg, Deurenberg-Yap, and Guricci, 2002; Misra, 2003; Zhou, 2002). In addition, fat-reduced behaviors were divided into three groups: rarely or never (score = 1), sometimes (score = 2), and always (score = 3) by averaging total fat behavior index scores. Consumption frequency of fruits and vegetables were categorized into less frequent users (intakes of 3.5 times or less per week) and more frequent users (intakes of more than 3.5 times per week).

Overall Quality of Life

Significant differences were found in the mean QOL scores for the length of time in Canada ($F(3,102) = 5.64$, $p = 0.001$), higher levels of English ($F(3, 102) = 4.40$, $p = 0.006$), and traditional health belief groups ($F(2,103) = 3.42$, $p = 0.04$). As shown in Figure 5, longer length of residency in the host country corresponded to higher average QOL scores. However, the scores reached a plateau after 15 years of residency. On the other hand, higher English proficiency showed significantly higher average QOL scores. People with moderate degree of traditional health beliefs had significantly higher average QOL scores than those who had THB-Weak. There was no difference in the average QOL scores between THB-Weak and THB-Strong. No significant relationships were found in mean QOL scores for other sociodemographic variables and dietary factors.

Figure 5

Mean Quality of Life Scores by (A) Length of Residency in Canada, (B) English Language Proficiency, and (C) Traditional Health Belief Groups



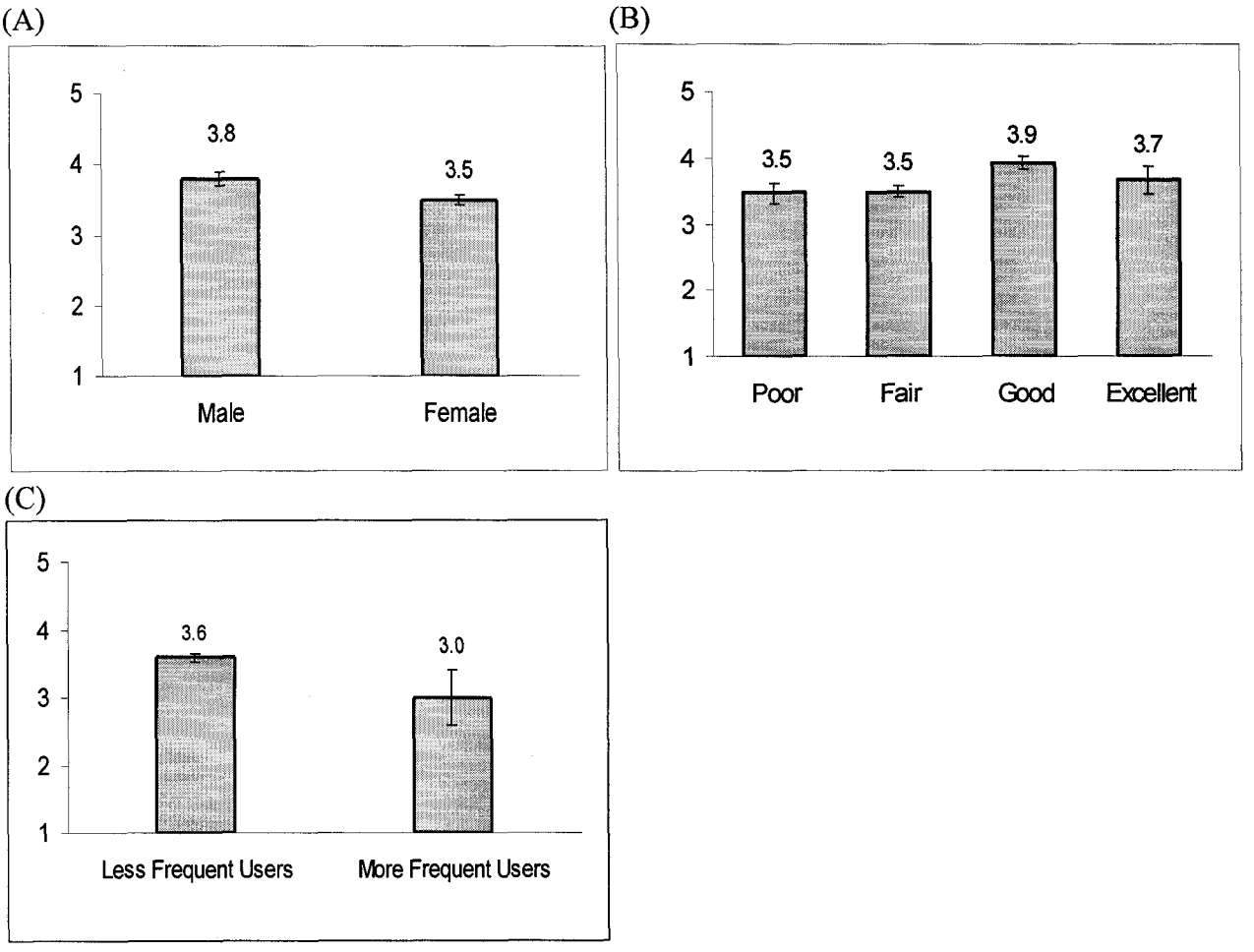
General Health

The mean general health scores were strongly associated with gender ($t(69) = 2.83$, $p = 0.01$), English proficiency ($F(3,102) = 3.21$, $p = 0.03$) and negatively associated with consumption frequency of potatoes ($t(104) = 2.00$, $p = 0.05$). Figure 6 illustrates theses relationships. Male respondents had higher average general health scores than females. Higher English proficiency was associated with higher average general health scores, but this effect was

most significant for people with good English levels. No additional benefits were found among individuals with excellent English proficiency on the mean general health scores. Interestingly, participants who consumed potatoes more frequently had lower average general health scores than less frequent consumers, probably because these potatoes were consumed in the form of high-fat, salty snacks such as potato chips and/or French fries, instead of baked or mashed potatoes. No other significant relationship was found with respect to other demographic factors, dietary habits and traditional health belief groups.

Figure 6

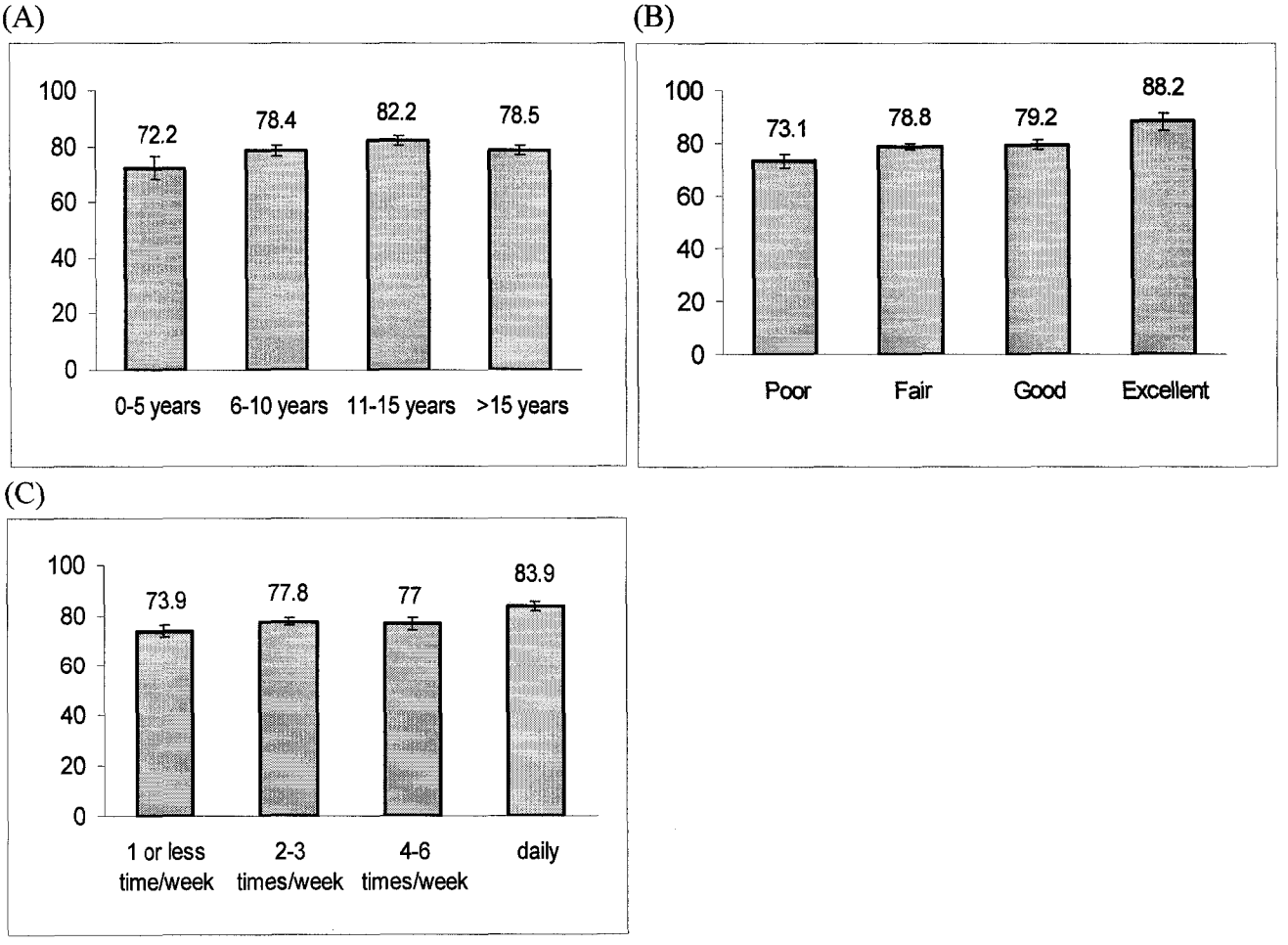
Mean General Health Scores by (A) Gender, (B) English Language Proficiency, and (C) Potato Intakes



Physical Health Domain

Significant differences in the mean physical health domain scores were observed in variables such as the length of residency in Canada ($F(3,102) = 2.67$, $p = 0.05$), English proficiency ($F(3,102) = 3.46$, $p = 0.02$), and frequency of physical activities ($F(3,101) = 5.11$, $p = 0.002$). Figure 7 shows that the longer residency in Canada was positively associated with higher average physical health scores. However, no additional increases in the mean scores were found beyond 15 years of residency. Participants who had better English skills and those who perform physical activities on a daily basis were more likely to have higher mean physical health scores.

Figure 7
Mean Physical Health Scores by (A) Length of Residency in Canada, (B) English Language Proficiency, and (C) Frequency of Physical Activities



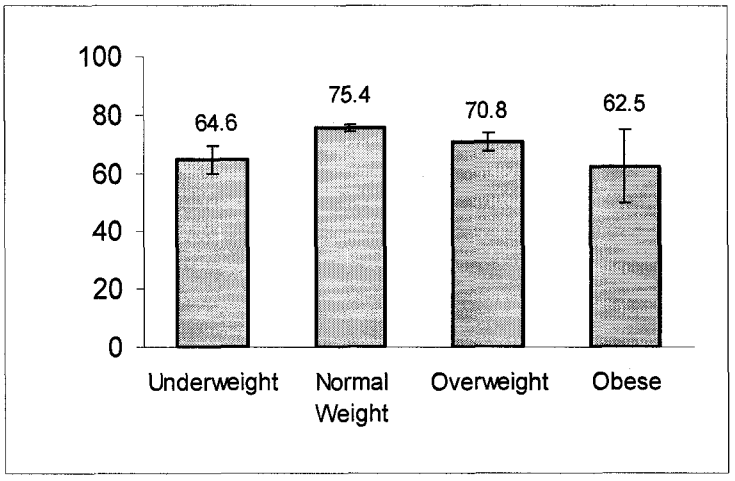
Psychological Well-Being Domain

No significant associations were found in the average psychological well-being scores for any of the demographic variables, dietary factors, or traditional health belief groups.

Social Relationships Domain

No significant differences were found among these demographic and dietary variables, except that the relationship between the mean social relationship scores and body mass index approached significance ($F(3,102) = 2.58$, $p = 0.06$). Figure 8 shows that at the normal BMI range, higher average social relationship scores were seen compared to the underweight, overweight or obese BMI categories.

Figure 8
Mean Social Relationship Scores by Body Mass Index Range



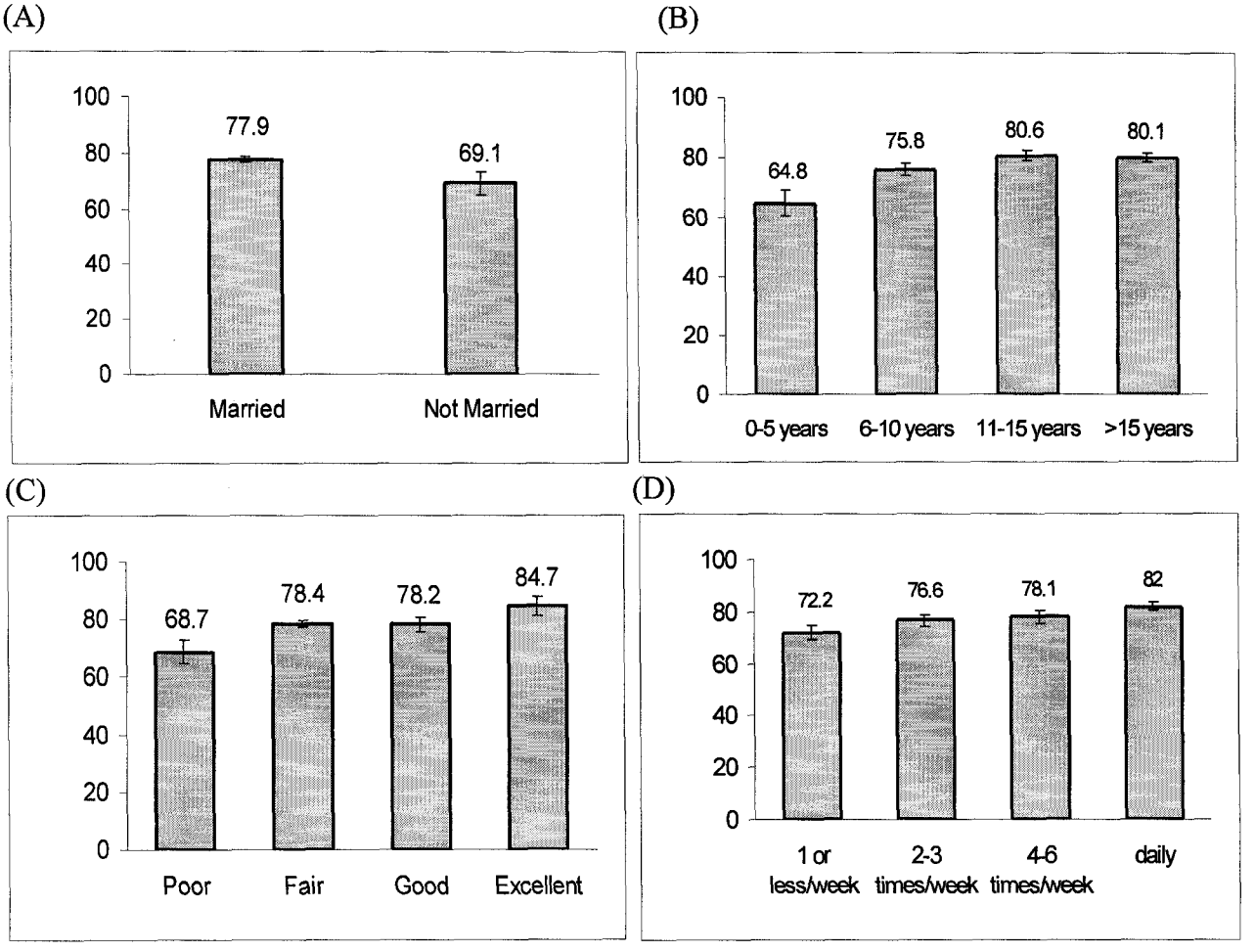
Environmental Domain

Average environmental scores differed significantly by marital status ($t(104) = 2.00$, $p = 0.05$), by length of time in Canada ($F(3,102) = 7.54$, $p < 0.001$), by English proficiency ($F(3,102) = 4.22$, $p = 0.007$), by frequency of physical activities ($F(3,101) = 3.63$, $p = 0.02$), and by traditional health belief groups ($F(2,103) = 3.11$, $p = 0.05$). Figure 9 shows that married

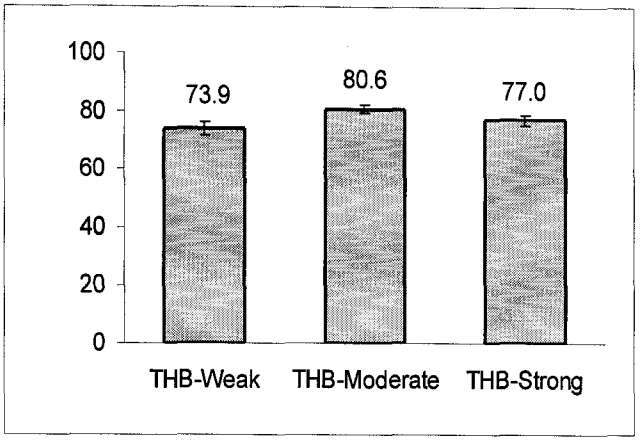
individuals had significantly higher average environmental scores than unmarried individuals. Higher mean scores were found in participants with longer length of residency in Canada (over 10 years), better English language proficiency and those who perform regular physical activities. In addition, individuals who belonged to the THB-Moderate group had significantly higher mean environmental scores than THB-Weak.

Figure 9

Mean Environment Scores by (A) Marital Status, (B) Length of Residency in Canada, (C) English Language Proficiency, (D) Frequency of Physical Activities, and (E) Traditional Health Belief Groups



(E)



Objective # 4: To qualitatively understand how participants perceive and incorporate the relationships between diet and health, and the Chinese functional foods, and Western foods into their daily lives.

Among all subjects, 62 participated in the open-ended section in the last part of the telephone interview, giving a response rate of 58%. Individuals were asked about their ideas of diet and health, examples of using Chinese foods to maintain and restore health, their perceptions on Western eating habits, and how they incorporate these foods into their daily dietary regime.

Perceptions about Diet and Health

A number of themes were identified from the interview and were summarized in Table 4.11. A majority of the participants recognized the roles that diet plays in the prevention and treatment of a disease, which can be achieved by carefully selecting and balancing the *Yin* and *Yang* foods in one's diet. This knowledge was derived mainly from the Chinese tradition, family and self practices, and/or the Chinese media.

Participants expressed their thoughts on the cultural beliefs of balancing *Yin* and *Yang* food based on an individual's body constituents. Nine participants commented on different properties of foods and discussed about the concept of food abstention. They believed that foods such as duck, goose, bamboo shoot, greasy and fried foods, and shellfish might exacerbate the

imbalance of the body, causing pus or swelling in wound, sore throat, and the outbreak of acnes. One should avoid orange, banana, bok choy, chicken and all greasy foods when having diseases of cold nature. Mutton or snakes are commonly eaten in the winter months to replenish blood and keep the body warm, whereas watermelon or winter melon are eaten during summer months to help prevent accumulation of excessive body heat.

A few participants were influenced by both Eastern and Western beliefs with regards to diet and health. For example, two subjects stated that they primarily applied the *Yin* and *Yang* diet therapy to cure a disease. If this therapy were not successful, she would turn to Western medicine and seek health advice from her family doctor.

Three individuals did not believe in the *Yin* and *Yang* diet therapy. One of them commented that this concept was "too restrictive" and it required a person to completely eliminate the intakes of certain hot and cold foods, which may result in inadequate food intakes. Interestingly, all these participants were between the ages of 45 and 49 years, had immigrated to Canada before 40 years old, and belonged to the THB-Weak group.

Table 4.11
Summary of Responses on Participants' Perceptions of Diet and Health

Believe in the Balance of *Yin* and *Yang* Foods for Good Health
Knowledge of *Yin* and *Yang* Comes From: • *Self Practice (12)*: - "I often use the *Yin* and *Yang* diet therapy to help prevent or treat diseases" - "I believe in Traditional Chinese Medicine and rely on it for good health" - "My body feels much better after balancing the *Yin* and *Yang* foods in my diet" - "I feel good about myself after eating or avoiding certain foods" • *Long History of Use (6)*: - "Traditional Chinese Medicine has a long history of use and has yielded promising results with more than billions of satisfied users" - "TCM has been used over thousands of years and hence, it must have some validity" - "TCM has been widely accepted by the Western society over the past several years" • *Family Practice (4)*: - "I learned TCM through my parents and my in-laws"

- "My mother always taught me how to balance *Yin* and *Yang* foods when I was young"

- *Chinese Media (1)*:
  - "I learned TCM through Chinese newspapers, radio stations and television as they often taught the audiences how to use diet therapy to maintain good health"

Perceptions on Diet and Health:

- *Food Properties (9)*:
  - "Not all Chinese foods have medicinal effects. In fact some foods may cause more harm than good if not eaten appropriately"
  - "Duck, goose, bamboo shoot, and all shellfish are believed to provoke poisoning and irritating reactions to the body, causing pus or swelling in wound, sore throat, outbreak of acnes and so forth"
  - "All greasy and fried foods may cause stomach upset, diarrhea or the outbreak of acnes"
  - "We need to avoid certain foods under certain circumstances. For example, orange, banana and bok choy should be avoided in the case of a cough; legumes, onion and potatoes when suffering from excessive gas in the stomach", and "chicken and all greasy foods when having a cold or flu"
  - "Foods with neutral properties are good for health"
  - "Seasonal adjustment of foods is important. For example, mutton or snake eaten during wintertime can replenish blood and keep the body warm, whereas watermelon, spring dew or winter melon consumed during summer months can facilitate bowel movement, enhance healthy gut, and prevent the accumulation of excessive body heat"

- *Traditional Beliefs (6)*:
  - "It is important to choose foods that are suitable for individual's body constituents since every individual has a different body base. Even two people who eat exactly the same diet may respond very differently to it"
  - "Adult women or an elder person have colder body base should therefore avoid eating cold foods"
  - "Good health can be maintained with careful selection of *Yin* and *Yang* foods in a diet, having adequate sleep, and frequent exercise"

- *Combine both Chinese and Western Medicines (4):*
  - "Although conventional medicine offers a more powerful and effective treatment, it has many significant side effects. I will use traditional Chinese medicine for treating milder disease such as cold and cough as it helps to cure the root of the problem, not only the symptoms"
  - "I think one should first use the *Yin* and *Yang* diet therapy to cure a disease. Only when this is not successful, medication should then be used"
  - "I believe that eating a balanced diet and integrating both Chinese and Western medicines are essential for good health"

Do Not Believe in the Balance of *Yin* and *Yang* Foods for Good Health

Perceptions on the *Yin* and *Yang* Diet Therapy:

- *Not Familiar (2):*

- "I have never heard of this concept"

- *Too Restrictive (1)*:
  - "I think the *Yin* and *Yang* concept is too restrictive. It often requires a person to entirely avoid the intakes of certain hot and cold foods. This may be bad for us since we may not get adequate amounts of nutrients as a result of restricting the intakes of those foods"

Note: The number next to each theme is the number of times referred by participants during the interview. These numbers did not add up to a total of 60 because some participants did not give any comments.

Examples of Using Chinese Foods in Treating or Preventing Illnesses

Table 4.12 listed the examples of Chinese foods these participants commonly used for preventing and treating illness. As mentioned by participants, these foods included ginger root, golden chrysanthemum five flower-scented green tea pellets, ginseng, mushroom, walnut, green beans, black beans, black skin chicken, bitter melon, pork liver, crocodile meat, sea cucumber, and Chinese hawthorn (Shanzha). Some foods such as red jujube, soups made with carrot and turnip or chicken were used as tonics to smooth the body system and to prevent the onset of disease. Certain foods such as mutton was consumed specifically during the winter months to restore vital energy and keep the body warm, whereas winter melon or watermelon was eaten in the summer time as a 'cooling agent' to help prevent the accumulation of excessive body heat. In addition, a few participants commented on the use of corresponding animal organs for treating human diseases. For example, deer tendon is used to strengthen the bones and tendons; chicken leg can strengthen one's joints and legs; pig's liver is used to replenish blood and treat liver diseases; and pork skin can enhance the smoothness and vitality of one's skin. Oftentimes, these functional foods are prepared in the form of soups or herbal teas rather than eating as solid substances.

Participants seemed to be influenced by both Chinese and Western health beliefs. For example, several mentioned about the 'Western' concept such as "fruits and vegetables have vitamins and fibers, which help strengthen body's immune system and prevent constipation",

"broccoli, tomato and mushroom help prevent against cancer", and "pig's liver is rich in iron that can replenish blood and energy". Interestingly, a few participants stated that they practiced the balance of *Yin* and *Yang* foods in their diet without knowing the reasons behind such practices.

Table 4.12
Participants' Opinions of Foods that Help Prevent and/or Cure Diseases

Food	Usage	Preparation	Functions	Contraindications
Ginger Root (7)	- Commonly used as a spice in Chinese cooking; - Suitable for people who have a cold body base, or those who are more prone to cold diseases	- Soak ginger root in water for several hours; - Prepare soup made with ginger, egg and chicken; - Boil water with ginger root , small amount of chamomile and tea leaves for couple of hours	- Alleviate cough, sore throat, symptoms of flu, headache and common cold; - Relief stomach gas, improve digestive functions and limit flatulence; - Prevent or relief nausea, reduce inflammation, dizziness, and stop bleeding	- Individuals who suffer from dry cough, thirst, and constipation may find ginger worsen their condition
Fruits & Vegetables (5)	- Contain vitamins and fibers	n/a	- Strengthen immune system, prevent against cancer & constipation	n/a
Golden Chrysanthe-mum Five Flower Scented Green Tea Pellets (5)	- Suitable for people who have excessive body heat	- Boil green tea pellets with chamomile	- Alleviate fever and remove excessive body heat ('hot air')	- Not suitable for individuals with a cold body base
Yellow Ginseng (American Origin) (5)	- Have a milder nature than Asian species; - Suitable for people with general weakness, lack of appetite, anemia, and older people with a colder body base; - Suitable for long-term use	- Simmer in hot water to make ginseng tea; - Boil water and add other ingredients to make into a soup	- Treat sore throat, enhance body strength and immune function - Regulate blood pressure, strengthen metabolism and protect against stress	n/a
Asian Ginseng (4)	- Suitable for people with general weakness	- Soup made with ginseng and chicken	- Normalize blood sugar, enhance immune function, improve body energy and reduce fatigue	n/a

Chinese Black Mushroom (4)	n/a	- Used in soups and stir-fries; - Soak in water or boil for several minutes	- Lower blood cholesterol and blood pressure	- People with high uric acid should avoid mushrooms
Food	**Usage**	**Preparation**	**Functions**	**Contraindications**
Walnut (3)	n/a	n/a	- Good for the brain	n/a
Chinese Angelica (3)	- Suitable for adults with a cooler body base or women during menstruation	- Put Chinese Angelica and other ingredients (e.g. ginger, mutton) in boiling water for 2 hours to make a soup	- Function as blood tonic & regulate menstruation pain	- Not suitable for children
Green beans (3)	- Suitable for people with excessive body heat	- Soup made with green beans and seaweeds	- Treat acne or pimples	- Not suitable for individuals with a cold body base
Black skin chicken (2)	- Good for people with poor appetite and so on illness	n/a	- Good for stomach - Alleviate fever	n/a
Bitter Melon (2)	n/a	- Stir fries with meats	- Lower blood cholesterol and blood pressure	n/a
Carrots & Turnips (1)	- Suitable for everyone due to its mild property	- Make into soup	- Remove bad breath and excessive body heat	n/a
Crocodile Meat (1)	n/a	- Combine other herbal ingredients to make into soups	- Cure asthma	n/a
Ginkgo Biloba (1)	n/a	n/a	- Promote mental health and brain functions	- Too much intakes can be toxic
Black Beans (1)	n/a	- Blend the black beans and make into liquid juice	- Treat baldness, ear humming, headache and nose bleeds	n/a
Chinese Hawthorn (Shanzha) (1)	n/a	- Boil in water	- Improve digestion, strength heart function, lower blood lipids, cholesterol and ease constipations	n/a
Red Jujube (1)	- For women after menstruation	- Boil in water	- Restore energy; - Blood tonic effect	n/a

Chicken Soup (1)	n/a	- Boil chicken in water and make into soups	- Help boost up one's energy level	- People with flu should avoid chicken soup
Food	**Usage**	**Preparation**	**Functions**	**Contraindications**
Sea Cucumber (1)	n/a	- Must be soaked before use; - Make into soups by adding bamboo shoots, mushrooms, chicken broth, and other seasoning	- Build healthy joints; - Improve blood circulation; - Lower blood pressure	n/a
Organ Specific Channel Tropism				
Deer Tendon (1)	n/a	n/a	- Strengthen bones and tendons	n/a
Chicken Leg (1)	- Suitable for people who are weak in leg	n/a	- Strengthen one's joints and legs	n/a
Pig's Liver (1)	n/a	- Boil liver slices and water for several minutes - Boil pig's liver and ginkgo biloba and make into a soup	- Rich in iron and helps to repair the body (liver) and replenish blood; - Treat liver disease	n/a
Pork Skin (1)	n/a	- Prepare dishes with pork skin	- Enhance the smoothness and vitality of one's skin	n/a
Seasonal Adjustment of Foods				
Mutton (4)	- Suitable for anaemic patients and to be eaten during winter months	- Boil mutton and ginseng in a hot pot	- Restore vital energy, raise the blood (increase red blood cells); - Increase appetite; - Keep body warm during the winter seasons	n/a
Winter Melon or Watermelon (2)	- To be eaten during summer months	n/a	- Remove excessive body heat and have a 'cooling effect'; - Facilitate bowel movement, enhance healthy gut	n/a

Note: The number next to each food item is the number of times participants refer to certain foods. Items that were not mentioned by participants were coded as "n/a".

Perceptions of Western and Chinese Foods

Responses were grouped into three main categories: individuals who preferred Chinese to Western foods; individuals who preferred Western to Chinese foods; or those who were not familiar with Western foods or their eating habits. Table 4.13 summarized the key findings.

Among participants who preferred a Chinese diet, some commented that Chinese meals have more variety of meats and vegetables; more delicious; contain the right portions of grains, meats and vegetables in each meal; better food quality and freshness; and higher nutritional values than Western meals. Chinese meals also emphasized the balance of *Yin* and *Yang* foods to achieve good health. Western foods, as stated by these participants, consisted mainly of high-fat, fried, and greasy foods, which they believed to be one of the main contributors to obesity. Many subjects were concerned about the popularity of fast foods and they worried about the negative health impacts on their children. In contrast, there were quite a few participants pointed out that Chinese foods might be high in fat and might contain loads of MSG, especially when meals were eaten at Chinese restaurants.

Several participants believed that Western foods are healthier and more nutritious than Chinese foods. For example, some mentioned "salad is a nutritious choice because vitamins and minerals are preserved when eaten raw", "milk is good for bones", or "Western cooking method is healthier since foods are often baked or grilled rather than deep-fried or fried". Also, many believed that Western meals are simpler and easier to prepare than Chinese meals. Some of their eating habits were influenced by their children and husband who preferred to eat more Western foods than Chinese foods. Others adapted a Western concept of nutrition and the idea of eating the right balance and quantity of foods. For example, some believed that " it is important to eat a balanced diet with lots of fruits and vegetables, grains and moderate amount of meat", or "I

believe no matter which eating habits we adapted, it is the amount and the type of foods we ate that matter more". Nine other participants stated that they were not familiar with Western foods and did not have much contact with the Canadian mainstream culture. Hence, their knowledge on Canadian alternative cuisine and food habits was limited.

Table 4.13
Perceptions and Attitudes on Western and Chinese Foods

Preferred Chinese Foods to Western Foods
• *Nutritional Value (20)* - "Food in Canada is fattening. There are too many junk foods, desserts, pastries, fried and greasy foods, which makes one gain weight or being obese" - "Western foods are high in fat, cholesterol, and are less healthy than Chinese foods" - "However, Chinese foods can be oily and may contain loads of MSG when eaten at restaurants"
• *Portion Size (12)*: -"Western people ate too many meats but not enough vegetables in each meal" -"Eating too many meats is bad for the heart" -"Their portions are often much bigger than the Chinese meals"
• *Fast Foods (11)*: -"I totally disagree with the fast food culture. My children like to eat/drink pops, fries, hamburger, and chicken nuggets. I always worried about their health by consuming too much of these junk foods" -"Fast foods are not healthy. These foods have poor quality and are too fatty"
• *Traditional Beliefs (9)*: - "Most Western foods are fried and deep-fried. Eating too many fried foods will lead to an imbalance of *Yin* and *Yang*, causing excessive heat accumulated in the body" - "Most Western people like fried foods and raw vegetables. They can eat them all right, and never have to balance the intake of *Yin* and *Yang* foods. However, our body is different from them. For us, eating too many of those foods can result in illness" - "Raw vegetables, frozen or marinated foods are too 'cold' for our body. They are not suitable for Chinese body base"
• *Taste (5)*: - "I like Chinese foods more since they are more delicious than Western foods" - "Western people use a lot of spices in cooking. I think spices are bad for health" - "Western desserts are too sweet"
• *Variety (3)*: - "Chinese meals have more variety. Western meals usually only contain a meat, potato, side vegetables, soup, beverages, but no more" - "Western foods have less variety. For example, Western people only eat one kind of

meat and vegetable in each meal; whereas the Chinese can enjoy varieties of vegetables and meats (e.g. chicken, pork, beef, seafood) in mixed dishes"
• *Food Quality/Freshness (3)*: - "Western foods are not fresh. People always prepare frozen and canned foods" - "The quality of chicken and fish is better in China or Hong Kong than in Canada. In China/Hong Kong, fish are often killed right before cooking"
Preferred Western Foods to Chinese Foods
• *Nutritional Values (8)*: - "Salad is a nutritious choice because vitamins and minerals are preserved when eaten raw" - "Milk is good for the bones" - "Western cooking method is healthier since foods are often baked or grilled rather than deep-fried or fried"
• *Convenience (8)*: - "Western meals are easier and more convenient to prepare"
• *Balance (5):* - "It is important to eat a balanced diet with lots of fruits and vegetables, grains and moderate amount of meat" - "No matter which eating habits we adapted, it is the amount and the type of foods we ate that matter more" - "Western foods can be healthy as long as we ate a balanced diet"
• *Personal/Family Members' Preferences (4)*: - "My children like Western foods, and this sometimes affect the whole family's diet" - "I have to prepare what my husband and children like to eat"
Not Familiar with Western Foods
• *Not Familiar (9):* - "I rarely eat Western foods so I have no idea what their eating habits are" - "I have been in Canada for less than 2 years and I do not have much contact with the Canadian mainstream culture"

Note: The number next to each theme is the number of times the topic referred by participants during the interview.

Integration of Western Foods into Participants' Diet

Seventy-nine percent of participants who took part in the open-ended section reported that they included Western foods as part of their usual diet. Western foods were adapted the most at breakfast and the least at dinner. The most commonly consumed breakfast items included milk and cereal, oatmeal, bagel with cream cheese, fried eggs, pancake, commercial

muffins, whole wheat toast, and/or coffee. Most participants stated that it is time-consuming to prepare Chinese breakfast such as congee, fried dumplings, and steamed buns; whereas Western foods are much easier and faster to make. Lunch items varied from sandwiches, spaghetti or pasta noodles, pizza, salad, milk, canned soup, chicken wings or TV dinners. Although dinner consisted mainly of the Chinese staple foods, some participants might occasionally serve beef steak, meatballs, barbecued lamb steak, lasagna, red wine, and/or salad. Eight subjects mentioned that they would prepare Western foods in Chinese cooking style (e.g. use soy sauce to marinate steak or pork chop, stir-fry spaghetti noodles etc.)

Objective # 5: To identify:

a) Where participants obtain primary source(s) of nutrition information

A majority of participants (88%) reported that they obtained nutrition information through Chinese media, including television, radio, newspapers, and magazines. Other sources included family and friends (68%), family doctors (43%), English media (40%), and books (20%). Dietitians and nutritionists were not frequently cited (12%). About 16% of the female and only 1% of male participants had sought nutrition and health advice from dietetics professionals. None of the participants mentioned that they obtained health-related information from the government.

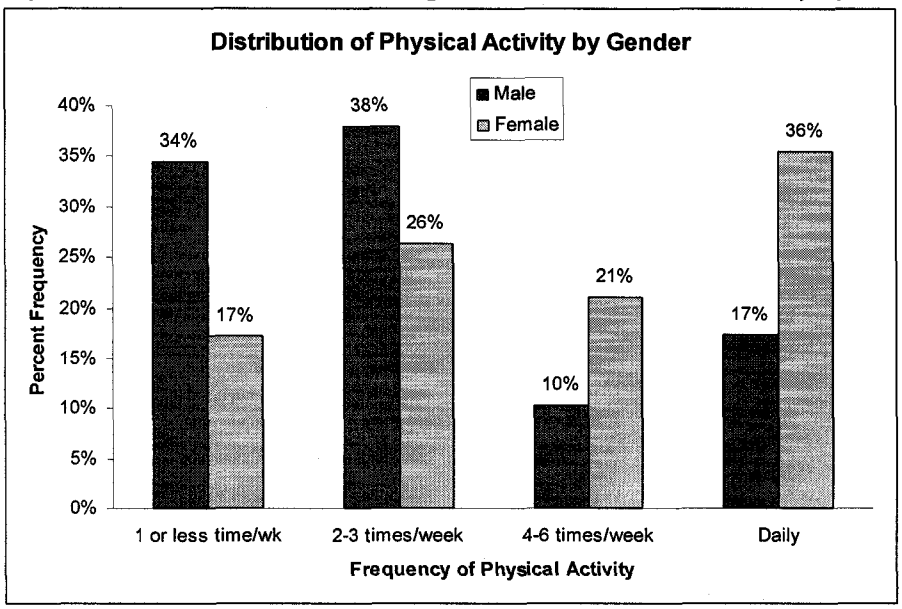
b) How often participants perform light intensity of physical activities for at least an hour per day in duration

The frequency of physical activities stratified by gender is listed in Figure 10. Less than one third (30%) of participants reported being physically active and had accumulated at least 60 minutes of light exercises every day. These included light walking (walking the stairs, to and from the car), vacuuming, easy gardening, stretching and so forth. Slightly less than one fifth

(18%) and one third (29%) of subjects reported spending at least an hour in light activities 4-6 days and 2-3 days a week, respectively. However, 23% reported having no regular physical activity of any kind or exercising only once a week.

Using the *Chi-Squared* test for independence, the association between frequency of physical activities and gender (Figure 10) approached significance (*Chi-Square*(3) = 7.49, p = 0.058). However, no significant associations were found in the frequency of physical activities with regards to age groups (*Chi-Square*(9) = 9.96, p = 0.35), degrees of traditional health beliefs (*Chi-Square*(6) = 8.73, p = 0.19), the length of time in Canada (*Chi-Square*(9) = 13.79, p = 0.13), and education levels (*Chi-Square*(15) = 11.91, p = 0.69).

Figure 10
Physical Activities Accumulated up to at least 60 Minutes a Day by Gender



c) Whether or not participants have difficulties in getting access to oriental foods of their choice

No. Almost all subjects (99%) reported that they had easy access to Chinese foods and oriental food markets in their local community.

d) *Whether or not participants experience a lack of social or economic access to adequate food, resulting in food insecurity*

Only one question in the survey directly assessed the issue on food insecurity, and that was, "in the past 4 weeks, did you never worry about not having enough money to buy food". Answers were grouped according to participants' degrees of agreement or disagreement. Only three percent of participants disagreed with that statement, whereas 82% claimed that they never worried about running out of money for foods in the past month, and 15% neither agree nor disagreed. Among these three individuals who stated that they had experienced a lack of money to buy foods in the past month, all of them belonged to a relatively younger age groups (from 45-54 years old), had lower levels of education (high school graduation or less), and rated their English proficiency as poor to fair.

Research Hypotheses

Traditional Health Beliefs

Hypothesis # 1: Older Chinese immigrants are more likely to follow traditional health beliefs of balancing the Yin and Yang foods than their younger counterparts.

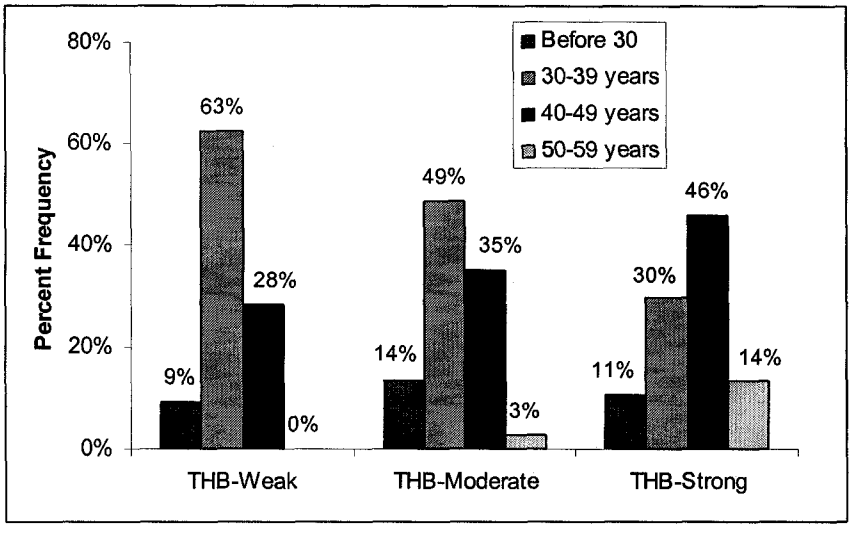
Results from *Chi-squared* test for independence show no significant association between the THB-grouping and age (*Chi-Square*(6) = 10.00, $p = 0.12$). Participants who were between 55 to 59 years old ($M = 64.41 \pm 5.56$) and 60 to 64 years old ($M = 64.50 \pm 5.32$) did not demonstrate stronger traditional health beliefs than younger participants who ranged from 45 to 49 years old ($M = 62.95 \pm 5.46$) and 50 to 54 years old ($M = 62.50 \pm 4.71$). No significant associations were found between the THB-grouping and gender (*Chi-Square*(2) = 3.46, $p = 0.18$), educational attainment (*Chi-Square*(10) = 9.88, $p = 0.45$), length of residency in Canada (*Chi-Square*(6) = 9.94, $p = 0.13$), the presence of young children in the household (*Chi-*

Square(2) = 1.78, $p = 0.41$), and their self-reported English proficiency (*Chi-Square*(6) = 3.02 , $p = 0.81$).

Hypothesis # 2: Immigrants who moved to the host country at an older age tend to have stronger traditional health beliefs than those who immigrated at a younger age.

The age at which participants immigrated to Canada was obtained by subtracting their self-reported age from the length of time in Canada. Most participants moved to Canada around the ages of 30-39 years (46%) and 40-49 years (37%), whereas 11% immigrated before ages 30. Only 6% of the participants moved to Canada between ages 50 and 59 years. Figure 11 shows a distribution of traditional health belief groups and participants' age at migration. The association between THB-grouping and age at migrations approached significance (*Chi-Square*(6) = 12.27, $p = 0.056$).

Figure 11
Age at Migration by Traditional Health Belief Groups



Hypothesis # 3: Individuals with stronger traditional Chinese health beliefs are more likely to select traditional ethnic foods and to demonstrate traditional eating behaviours.

The purpose of this study was to examine the quality of life domains in relation to health beliefs and dietary behaviours. It was not intended to assess the consumption frequency of

traditional Chinese foods such as steamed bun, dumpling, rice, bamboo shoots, eggplant, Napa cabbage, bean sprouts, lychee or persimmon, and soybeans.

Nevertheless, it was found that subjects who had the strongest traditional health beliefs were more likely to express their views about using Chinese foods for the prevention and treatment of a disease than those who were in THB-Moderate or THB-Weak. However, results from *Chi-square* test show that no significant association between the THB-grouping and the selection of Chinese foods for breakfast (*Chi-Square*(4) = 5.03, p = 0.28), for lunch (*Chi-Square*(4) = 0.99, p = 0.91), for dinner (*Chi Square*(2) = 1.11, p = 0.57), and the consumption frequency of tofu (*Chi Square*(4) = 1.48, p = 0.83).

Dietary Acculturation

Hypothesis # 4: Less acculturated immigrants are more likely to exhibit healthful behaviours related to selecting reduced-fat diet, and consuming fruits and vegetables more often than more acculturated individuals.

According to the literature, more acculturated immigrants tend to have a longer length of residency in the host country, higher level of education, young children in the household, at a relatively younger age, fluent in the host language, and migrating to the host country at a younger age than less acculturated individuals (Yang & Fox, 1979; Satia et al., 2001a; Lv & Cason, 2004; Wu-Tso, Yeh & Tam, 1995; Chau, Lee, Tseng & Downes, 1990; Pan, Dixon, Himburg, & Huffman, 1999).

Using the Kruskal Wallis test, significant associations were found in the rank-average frequency of reducing intakes of deep-fried foods (*Chi-Square*(1) = 6.15, p = 0.013), trimming visible fats from meat before cooking (*Chi-Square*(1) = 4.27, p = 0.039), replacing higher-fat foods with lower-fat alternatives (*Chi-Square*(1) = 8.77, p = 0.003), and avoid eating fried foods (*Chi-Square*(1) = 5.80, p = 0.016) of participants in various age groups (Table 4.14). However,

no significant associations were found between the mean consumption frequency of fruits and vegetables of these age groups.

Table 4.14
Average Frequency of Practicing Fat-Related Behaviours (M ± SD) by Age Groups

	Younger Participants (45-54 years old) M ± SD	Older Participants (55-64 years old) M ± SD
Decrease consumption of deep-fried foods	2.59 ± 0.61	2.86 ± 0.35
Trim fats before cooking	2.65 ± 0.60	2.86 ± 0.41
Substitute low-fat alternatives for high-fat foods	2.52 ± 0.69	2.88 ± 0.32
Avoid eating fried food	2.52 ± 0.54	2.77 ± 0.43

Significant difference was found in the frequency of substituting lower-fat for higher-fat foods among participants who had lived in Canada for 10 or more years (M = 2.79 ± 0.48) as compared to those who had lived in Canada for less than 10 years (M = 2.48 ± 0.72) (*Chi-Square*(1) = 5.88, p = 0.015). Participants who immigrated to Canada at an older age had a significantly higher average frequency of avoiding fried foods than others who immigrated at a younger age (*Chi-Square*(3) = 8.79, p = 0.032), (M (0-44 years) = 2.51 ± 0.54, M (40-49 years) = 2.67 ± 0.49, M (0-64 years) = 2.83 ± 0.41, M (>45 years) = 2.86 ± 0.36).

The mean consumption frequency of potatoes was positively associated with educational attainments and English language proficiency. Participants who had a higher educational attainment (college degree or above) consumed potatoes more often (M = 1.44 ± 0.60) than others with lower educational levels (M = 1.20 ± 0.46), (*Chi-Square*(1) = 5.18, p = 0.023). Also, individuals with a higher English proficiency were more frequently consumed potatoes (M = 1.57 ± 0.63) than others who were not proficient in English (M = 1.24 ± 0.49), (*Chi-Square*(1) = 8.564, p = 0.003).

Interestingly, the mean consumption frequency of lettuce salad was positively associated with educational attainment (M (higher education) = 1.30 ± 0.57 vs. M (lower education) = 1.10 ± 0.37), (*Chi-Square*(1) = 4.91, p = 0.027) and English language proficiency (M (higher proficiency) = 1.40 ± 0.62 vs. M (lower proficiency) 1.13 ± 0.41) (*Chi-Square*(1) = 7.70, p = 0.006).

DISCUSSION

Research Objectives

Objective # 1: To identify dietary habits, health beliefs, and perceived quality of life among Chinese-Canadians living in Toronto.

Dietary Habits

Participants' Dietary Patterns

The results of this study indicate that among these Chinese Canadian adults, breakfast was the first meal to be "Westernized" after immigration, largely for reasons of convenience. Lunch and dinner consisted mainly of the traditional Chinese staple foods although in some cases Western foods such as meatballs, lasagna, spaghetti or salad were served. A majority of the immigrants incorporated both Chinese and Western styles of cooking, and would prepare Western foods in a Chinese way, and vice versa. For those individuals who rarely ate Western foods, most of them lived in Canada for the shortest period of time.

These findings suggest that dietary acculturation is a gradual and continuous process. It does not occur at the same rate for all immigrants. Immigrants will slowly adopt Western foods and its eating habits while maintaining Chinese dietary patterns, rather than giving up their cultural practices entirely. For instance, immigrants will replace some traditional Chinese foods, such as rice, pork, leafy green and cruciferous vegetables, soups and tea, with 'new foods', such as red meats, coffee and wheat products (Hsu-Hage, Ibiebele & Wahlqvist, 1995). Our results support the earlier studies (Satia et al., 2001b; Berry, 1980; Szapocznik & Kurtines, 1980), which found that dietary acculturation is a multidimensional, dynamic, and complex process. It is not as simple as an individual moving from one end of the acculturation spectrum to another.

The choice of foods is influenced by multiple factors including convenience, availability, food cost, quality, religion, taste, health beliefs, dietary knowledge and so forth.

Most participants reported that they attempted to eat healthily by choosing nutritious foods such as fruits and vegetables and grain products more often. This result is consistent with the previous studies showing that traditional Chinese eating habits emphasize mainly on vegetables and rice, with relatively little meat (Wu-Tso, Yeh & Tam, 1995; Campbell, Parpia & Chen, 1998; Yu, Harris, Gao, Gao & Wynder, 1991; Woo et al., 2001; Woo & Donnan, 1989). In contrast, the North American Caucasians typically have high intakes of fat and saturated fat, and low intakes of calcium and fiber-containing foods such as whole grains, fruits and vegetables. Such eating patterns are associated with increased risk of several chronic diseases such as coronary heart disease, cancer, hypertension, stroke, diabetes, obesity, and osteoporosis (Satia et al., 2001a; Lv & Cason, 2004).

To reduce the risk of chronic diseases, the food industry, voluntary organizations, Federal, provincial and territorial government agencies have been actively engaged in a myriad of efforts to promote healthy eating, and improve health and well-being of North Americans through nutrition education programs to provide consumers the knowledge to make informed food choices. Examples of these healthy eating initiatives include 5-A-Day for Better Health, Healthy People 2010, the Nutrition Labeling and Education Act (NLEA), Canada's Food Guide to Healthy Eating and so forth. Nevertheless, there seems to be a need for more health promotion programs and research studies to target individuals across different ethnic groups. For example, this study identified nutrition related behaviors of Chinese Canadian participants with unique health impacts as discussed in the following sections.

Fat-Related Behaviors

Overall, participants reported strong intentions to adopt a reduced fat diet by regularly trimming visible fats from meat before cooking, using less oil in food preparation, decreasing the consumption of fried and deep-fried foods, preparing foods by boiling or steaming, and substituting specially manufactured low-fat foods for their higher-fat counterparts. These findings are supported by a study on Chinese American adults, which reported that the first generation Chinese often practiced the healthy behaviors related to preparing tasty, low-fat dishes, modifying recipes to make them lower in fat, and replacing high-fat foods with fruits and vegetables (Liou, 2004).

The least commonly practiced behavioral strategy was the attempt to reduce meals consumed at Chinese restaurants. Eating *dim sum* at traditional Chinese restaurants is the most famous Cantonese specialty. Since a majority of our subjects originated from Southern China, in particular from Hong Kong and the Guangdong province, this suggests that the unique dietary habit of eating *dim sum* at traditional Chinese restaurants is retained even after participants have immigrated to Canada. Our participants reported that on average, they ate out at Chinese restaurants for approximately two to three times a week. Such frequent eating at restaurants points out not only the Chinese enjoys eating good foods, but also the importance of social events with family and friends.

Fruits & Vegetables Intakes

Fruits and green leafy vegetables were consumed almost everyday in the week by our study participants, suggesting that fruits and vegetables continue to form a fundamental part of their diet. Traditional Chinese foods such as Chinese turnips, watercress, mustard greens, bitter melon, and tofu were quite frequently consumed, with average intakes of two to three times a

week. However, the consumption frequency of the traditional Chinese foods would have been significantly reduced in regions of Canada where these foods are less accessible. Fruit juice, lettuce salad and potato (boiled, baked, or mashed) are considered primarily as Western foods, and that these participants reported average intakes of about once or twice a week. Inclusion of these Western foods into their diet would necessitate a reduction in the consumption of traditional Chinese foods, as pointed out by Lv and Cason (2004).

It is unclear whether their consumption frequency of these Chinese and Western foods increased or decreased was a result of immigration. Perhaps a food frequency questionnaire designed to gather changes in consumption patterns can be considered for future studies.

Health Beliefs

General and Specific Traditional Health Beliefs

The general concepts about the necessity of eating meals in appropriate portion sizes and the relationship between diet and chronic diseases were well established. However, a large portion of the participants appeared to disagree with the traditional Chinese belief of eating three regular meals a day and no snacks in between can maintain good health. While few participants reported skipping meals, especially breakfast, more than half of them reported a habit of eating snacks such as fresh fruits and crackers. This change of dietary habit could be explained by the result of acculturation in which participants adopted both healthful (consuming fruits for snacks) and unhealthful changes (skipping meals). In addition, some individuals might be influenced by the Western concept of nutrition, which emphasized on the importance of consuming healthy and nutritious snacks such as fruits and vegetable salads.

For more specific traditional health beliefs, the use of food modification during and after illnesses received the highest consensus. This suggests that our subjects may rely primarily on

diet therapy to treat milder diseases before seeking advice from medical professionals, and/or in complement to conventional medicines to facilitate recovery. The belief in seasonal adjustments of foods was very prevalent. Since the weather in Southern China and Hong Kong are always changeable, conditions such as the common cold and influenza occur frequently during climate changes. Most of our participants may have been used to the practice of consuming specific foods during specific seasons to maintain harmony in the body and prevent against diseases. Therefore, they are likely to retain this belief after immigration. Similarly, the belief in various properties of foods is widely accepted. Some foods such as shellfish are believed to cause 'wet', 'irritating' or 'poisoning' reactions to the body, and regular intakes of tonic foods, in the form of soups, can prevent illnesses.

A majority of the participants believed in the most popular *Yin* and *Yang* health belief model for health maintenance. However, not as many individuals reported a regular practice of *Yin* and *Yang*, and more than half of them were unable to recognize the functions of 'hot' foods. This finding suggests that although individuals stated that they believed in traditional Chinese health beliefs, many of them might not fully understand the reasons why they should. Also, as most of our participants are highly educated and have a longer length of residency in Canada, they may have influenced by the Western culture and adopted the behaviors of the majority society. This explains why some participants were doubtful about the rationale of the traditional Chinese health beliefs, whereas others might have simply lost their cultural heritage due to acculturation.

Traditional Health Belief Grouping

Based on the scores obtained from the traditional health belief index, subjects were grouped into THB-Weak, THB-Moderate, and THB-Strong. The validity of this grouping was

confirmed by the *Chi-Square* statistics, which found that participants who had the strongest traditional health beliefs were significantly more likely to believe in and practice balancing 'hot' and 'cold' foods in meals than those in the THB-Weak or THB-Moderate groups. The likelihood of such group differences happening by chance was extremely low, with a probability of less than one time in a thousand, meaning that this grouping result was reliable.

This present study is the first research applying a traditional health belief grouping method in Chinese Canadians. Identifying subjects according to their degrees of traditional health beliefs is essential in helping us understand how individuals view diet and health, their unique concerns and preferences. Such knowledge will be useful in developing culturally sensitive health promotion programs for Chinese Canadians, improving the efficacy of communication and the quality of care between health providers and clients of the minority groups.

Overall Quality of Life

The WHOQOL-BREF is a generic quality of life measure stemmed from WHOQOL-100 which allows detailed assessment of each individual facet related to quality of life. It contains two overall questions on quality of life and general health, and scores for four domains related to quality of life including physical health, psychological well-being, social relationships, and environment. Detailed discussion of this WHOQOL-BREF instrument will be outlined in Section 5.3, Theoretical Framework.

Our study participants reported to have a relatively better physical health (M = 78.62 ± 10.27) and environmental well-being (M = 77.33 ± 11.49) as compared to their psychological health (M = 73.82 ± 9.99) and social relations (M = 74.06 ± 12.16). These domain scores ranged from 0 to 100. Lower psychological well-being and social relationship scores could be explained

by some possible changes that might occur as a result of immigration. For example, despite high educational attainments among most participants, it is speculated that some of them might either be unemployed or underemployed. A few participants might experience some unusually stressful events such as grief related to death, loss of employment, or being trapped in a situation or relationship in which one perceives a lack of power to control over. These speculated changes may create an acculturative stress manifested in the form of depression (because of culture loss) and anxiety (because of uncertainties about the future).

Hovey (1999) conducted a study among Central American immigrants in Los Angeles, which found that family dysfunction, non-married status, ineffective social support, non-positive expectations for the future, infrequent church attendance and lack of agreement with the decision to migrate were significantly associated with greater levels of acculturative stress. Wong, Yoo, and Stewart (2005) examined the types of social support identified by older Chinese and Korean immigrants during focus group interviews. Participants revealed the importance of tangible (e.g. relying on their older children for help with situations like carrying heavy groceries or transportation), information/advice (e.g. learning to speak English, applying for citizenship), emotional, companionship, and language (e.g. replying on others to communicate with their physicians and other healthcare providers) supports. Immigrants also encountered transitions between two cultures: one that is strongly kinship oriented where needs and desires are subordinated to the interests of the family (Chinese) and one that values independence and celebrates individuality (North American).

The overall assessment of quality of life and general health indicated that a majority of the participants were satisfied with their lives and general health. This finding is expected because our study excluded people with chronic illnesses and certain medical conditions. A

recent review study using Statistics Canada data (National Population Health Survey and the Canadian Community Health Survey) to compare immigrants' health with that of Canadian-born supported our results. 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 behaviors, and make similar or less frequent use of health services (Ali, McDermott & Gravel, 2004).

When linear regression analyses was performed for the entire sample, the overall assessment of quality of life was significantly associated with perceived physical health, psychological well-being and environmental conditions. This indicates that individuals who are satisfied with their lives are more likely to have good perceptions on their physical health, psychological health, and the environment. Social relations are known to be associated with improved quality of life in many studies (WHOQOL-BREF, 1996; 1998; WHO, 1998), but our analyses did not demonstrate this relationship. It is unclear why no association was found between social relationships and quality of life in this study. Future studies that explore the importance of social relationships and factors affecting social networks among Chinese Canadian immigrants may be useful.

As predicted, the assessment of general health is significantly related to physical health, psychological health, and social relationships, but not on environmental well-being in the simple regression models. In other words, individuals who have good physical and psychological health and social supports are more likely to have positive feelings about their overall health. A slight discrepancy in results was found between the linear and multiple regression analysis on general health. Multiple regression analysis showed that better physical health and social relationships were two important factors to improve participants' general perceived health.

Objective # 2: To determine the differences in food selection and preparation among participants with varying degrees of traditional Chinese health beliefs.

Fat-Related Behaviors

It is anticipated that individuals with the strongest traditional Chinese health beliefs (THB-Strong) would exhibit fat reduced behaviors more often than those in THB-Moderate and THB-Weak groups. However, no significant relationship was found in the total fat related behavior scores, with the exception of two fat reduced practices. Compared to THB-Moderate, subjects in THB-Strong group less frequently reduced the amount of added oil in cooking and/or trimmed visible fats from meat. This finding agrees with traditional Chinese cooking in that oil and fat were considered important components of flavor. Moreover, the practice of reducing the amount of oil in cooking and removing visible fats from meat are Western concepts that THB-Strong individuals were not accustomed to.

Although no statistical significant differences were found in other behaviors, there was a tendency that THB-Strong groups were more likely to reduce the consumption of deep-fried and fried foods, replace high fat foods with lower fat alternatives, and reduce meals consumed at Chinese restaurants. An explanation for this is that people with the strongest traditional health beliefs are more likely to adhere to the traditional Chinese diet and practice the balance of 'hot' and 'cold' foods in their diet. According to the *Yin* and *Yang* traditional Chinese health belief theory, fried, deep-fried, and all other greasy foods are classified as too *Yang* or 'hot' in nature, and should therefore be avoided. This explains why lower consumption frequency of these 'hot' foods was observed among THB-Strong individuals. Participants who had moderate degree of traditional Chinese health beliefs are more influenced by the Western concepts of health and nutrition, and hence practiced these fat-reduced behaviors more often than others.

Fruits and Vegetables Intakes

No significant association was found between mean consumption frequency of fruits and vegetables among the THB groups. In fact, a typical Chinese diet is higher in carbohydrate and fiber, and lower in fat than the Western diet (Wu-Tso, Yeh & Tam, 1995). Our result suggests that fruits and vegetables were frequently consumed by these Chinese Canadians regardless of what degree of traditional health beliefs they held. This is not surprising as fruits and vegetables make up a good proportion of their traditional diet.

Objective # 3: To determine how demographic and nutrition related factors such as dietary habits, health beliefs, degree of acculturation, age, and education levels influence participants' perceived quality of life.

Overall Quality of Life

It was found that participants who have lived in Canada longer, having higher levels of proficiency in English, and moderate degrees of traditional Chinese health beliefs (THB-Moderate) were more satisfied with their lives than their counterparts.

The length of residency in Canada was positively associated with overall QOL, but this relationship reached a plateau after 15 years of residency. This plateauing effect suggests that this time period is necessary for immigrants to establish themselves in the new environment to achieve their goal, expectations and well-being. Studies on the length of residency and quality of life by other researchers (Aroian & Norris, 2002; Leon, 2002) have shown that the most recent immigrants were more likely to encounter the problems of depression, anxiety with their new environment, unemployment, and not having relatives in the local resettlement area. On the other hand, more acculturated immigrants (i.e., those who spent longer time in the host country) were found to have a better mental health, lower levels of social alienation, family and personal stress than recent immigrants (Miller et al., 2006). Moreover, our study showed that higher

proficiency in English was positively related to satisfaction with life. In support of this finding, some previous studies have shown that better English proficiency is not only confined to economic benefits, particularly higher earnings and possibility of obtaining a high status occupation (Park, 1999; Kogut, 1998), but also to other QOL indicators such as enjoyment of good health and lower probability to rely on public assistance (Godoy, Redstone, Islam, Price, Saeed & Tabassum, 2001).

Individuals in the THB-Moderate group had better perceived QOL than THB-Weak. This suggests that people who adhered to traditional Chinese health beliefs (probably also influenced by the Western health and nutrition concept to a small extent) were happier and more satisfied with their lives than those who did not adhere to the traditional health beliefs. This finding agrees with the previous study conducted among 44 Chinese elderly in Taiwan, which found that traditional Chinese health beliefs exerted a positive influence on perceived QOL as it provided guidance for these elderly people in dealing with the process of aging (Leung, Wu, Lue & Tang, 2004). Also, it is possible that by following closely in their traditional beliefs, immigrants can develop a stronger sense of identity and belonging to their own culture, and hence a better QOL (Bhugra & Becker, 2005). For these reasons, it is anticipated that people who have the strongest traditional Chinese health beliefs would have a better perceived QOL than their counterparts. However, no difference in overall QOL was found among subjects in the THB-Strong group as compared to THB-Weak and THB-Moderate, and the reason for this remained unclear. Future studies that examine the relationships between immigrants following traditional health beliefs and overall life satisfaction may be helpful.

General Health

Our results also suggest that being male and having higher levels of English language proficiency were related to higher satisfaction with general health.

Although men are less health conscious than women, they are less likely to experience depression and have lower prevalence of mental health impairments (Blehar & Oren, 1997). Depressed individuals might comorbid with social phobia because of the fear of being exposed to the scrutiny of others and speaking in front of a group. This has shown to be strongly associated with decreased well-being, compromised health and quality of life, and poor psychosocial adjustment (Kimberling & Ouimette, 2002). Limited English capacity is a major barrier to an effective healthcare and perceived health (Wilson, Chen, Grumbach, Wang & Fernandez, 2005). Although there were many health care providers in the local Toronto communities who speak Chinese, oftentimes immigrants could not communicate effectively with their doctors or other healthcare professionals. Many immigrants had great difficulties in getting access to quality care and felt that their health providers were rude or disrespectful because of the language difficulties and different ethnic backgrounds. Besides, many health providers might not be familiar with the Chinese ethnicity and could not make the appropriate recommendations suitable to patients' needs. Wilson et al. (2005) found that respondents with limited English proficiency reported problems understanding a medical situation, trouble understanding labels, and bad medication reactions. The access to language-concordant physicians could substantially mitigate the problems but did not eliminate language barriers.

Another finding was the negative relationship between consumption frequency of potatoes and general health. It is likely that participants who frequently consumed potatoes in the form of high-fat snacks such as French fries or potato chips, which compromised their health.

This finding could also imply that participants consumed less of the healthy traditional Chinese foods (e.g. rice, noodles, fruits and vegetables) but more of the Western foods (e.g. potatoes).

Physical Health Domain

Higher levels of English proficiency, higher frequency of physical activities and longer length of residency in Canada were associated with better perceived physical well-being.

As discussed above, better English proficiency enables the immigrants to access healthcare services and communicate with their healthcare providers effectively, which consequently can improve their physical health status. The benefits of physical activity for health are well established. Regular physical activity is associated with a decreased risk of cardiovascular disease and all-cause mortality and has favorable effects on blood pressure, lipid, and lipoprotein profiles, weight control and body fat distribution, as well as on mental health (Brown, Balluz, Heath, Moriarty, Ford, & Giles et al., 2003; Rejeski & Mihalko, 2001). This study also found that immigrants who have lived in Canada for 11 to 15 years had better physical health, but no additional health benefits for those who immigrated for more than 15 years. This result is different from some recent studies conducted among middle aged (45-64 years) immigrants in Canada, which found that those who immigrated less than 10 years had better functional and self-rated health compared to their longer-term counterparts who immigrated 10 years or longer (Gee, Kobayashi & Prus, 2003). This might probably be due to the healthy behaviors immigrants practiced in their home country, health screening by immigration officers, and immigrant self-selection whereby the healthiest and wealthiest were the ones most likely to migrate (Gee, Kobayashi & Prus, 2003; McDonald & Kennedy, 2005). However, immigrants who had been in Canada for 20 to 30 years were found to be associated with poorer physical

health, had similar to or higher levels of overweight or obese than those of native-born Canadians due to acculturation (McDonald & Kennedy, 2005).

No association was found between being overweight/obese (BMI > 28.0) and perceived physical health. This was unexpected because many other studies indicate that obesity is associated with increased health risk such as diabetes, hypertension, coronary heart disease, respiratory disease, osteoarthritis, and mobility impairment, causing impaired physical and mental health (Larrsson, Karlsson & Sullivan, 2002; Hassan, Joshi, Madhavan & Amonkar, 2003). One explanation might be that our participants were not aware of this association either because they did not perceive themselves as overweight or had not yet suffered from the negative health impacts of obesity. A recent study combined data drawn from various surveys including the National Population Health Survey, the Canadian Community Health Survey and Health Promotion Survey reported that there were large discrepancies among both genders in their self-reported versus measured rates of obesity (BMI $\geq$ 30), indicating that obese men and women were equally likely to underreport their body weight (CIHI, 2006). Interestingly, this report also found that immigrants who came to Canada more than 11 years ago had a higher prevalence of self-reported overweight or obesity compared to more recent immigrants (10 years or less), and the odds of being overweight were lower among East or Southeast Asian immigrants (CIHI, 2006).

Psychological Well-Being Domain

The lack of significant relationships in psychological well-being among participants with different demographic characteristics, eating habits and traditional health beliefs in this study were unexpected. Previous research study suggests that marriage contributes to a better overall psychological health and higher quality living (Lamb, Lee & DeMarris, 2003) since married

couples generally reported higher levels of social, immediate intimate emotional and economical supports than unmarried individuals (Mayo Clinic Staff, 2004). Besides, it is well recognized that eating a healthy, balanced diet and being physically active help people maintain appropriate body weight. Together, regular physical activity and healthy eating can contribute towards reducing obesity and improving psychological well-being, mood and self-esteem (Netz & Wu, 2005, Nothwehr & Peterson, 2005). The insignificant results found in our present study imply that participants were generally happy about their lives and most of them were free from psychological distress.

Social Relationship Domain

Participants who were obese or underweight reported less perceived support from friends and family, and more negative social interactions than others with normal body weight. 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 (Hill & Williams, 1998; Ball, Crawford & Kenardy, 2004).

Environmental Domain

Better perceived environmental well-being was found in participants who were married, being physically active, had lived in Canada for more than 10 years, and a higher level of English proficiency. The benefits of a healthy marriage have been documented by many researchers. Married couples tended to have more financial stability, expanded social networks and supports, less probability of depression, and increased healthy activities or behaviors partly due to a sense of responsibility to a spouse (Lamb, Lee & DeMarris, 2003, Mayo Clinic Staff, 2004). Regular leisure activity can help decrease the risk of chronic diseases while improving

the quality of life and environmental well-being. Also, immigrants who have lived in Canada for more than 10 years were more satisfied with their environment because they tend to be more familiar with the Canadian society and be able to locate information as required in their daily lives. Similarly, people with higher levels of English proficiency are less likely to have language barriers when accessing to healthcare services or acquiring information as needed compared to those who have limited English proficiency.

Objective # 4: To qualitatively understand how participants perceive and incorporate the relationships between diet and health, and the Chinese functional foods, and Western foods into their daily lives.

Perceptions about Diet and Health

The belief that certain foods have a role in preventing and treating diseases was very prevalent among the participants. According to the traditional Chinese view, health is thought to be maintained by balancing a number of factors, including the 'hot' and 'cold' foods in diet. Illnesses that are caused by an excess of *Yin*, or 'cold' can be treated by 'hot' foods, whereas conditions that are caused by an excess of *Yang,* or 'hot' can be treated by 'cold' foods (Tan & Wheeler, 1983). Many participants were familiar with this concept and were able to apply 'hot' foods such as ginger root to treat diseases of a cold nature (e.g. cough), and to avoid 'cold' foods such as banana, bok choy, and orange. The theory of equilibrium was also mentioned by our participants. They believed that as an individual gets older, the state of equilibrium will shift from hotter to colder body base, and therefore, should consume foods that are 'hot' in nature such as red jujube to help restore blood and energy. The knowledge of traditional health beliefs were affected and reinforced by the experiences and skills learned from family members and friends, and from the Chinese media.

A few participants were influenced by the Western health concept and were skeptical about the Chinese system. These subjects were relatively younger, had immigrated to Canada before 40

years old and belonged to the THB-Weak group. This finding agrees with our hypotheses, which suggest that perhaps younger participants and those who had moved to Canada at an earlier age are less likely to follow the traditional Chinese health beliefs. Further examination of these hypotheses will be discussed in Section 5.2: Research Hypotheses. One participant was concerned about limiting the intakes of certain 'hot' and 'cold' foods might result in nutritional inadequacy. Many others incorporated both Western and Chinese systems to treat diseases. For instance, they will use diet therapy and other traditional Chinese remedies to treat diseases of a milder nature, but conventional medicines to treat more serious illnesses. This finding supports other studies, which found that Chinese people would make their own decisions on which type of doctors or treatments they wanted to receive depending on the severity of their disease conditions (Lam, 2001; Chan et al., 2003).

Examples of Using Chinese Foods in Treating or Preventing Illnesses

The folk remedies of using food modification in disease treatment and prevention was found to be very popular with our study participants. This supports the common belief that Chinese dietary therapy helps alleviate minor symptoms and discomforts, correct energy imbalance and cure the root of a problem beyond that of Western medicine (Koo, 1984).

Among these commonly used medicinal foods, some produces such as ginger root, walnut, green beans, carrots, turnips, black beans, and watermelon are available in the Western grocery stores. However, some items such as golden chrysanthemum five flower scented green tea pellets, ginseng, Chinese black mushroom, Chinese Angelica, black skin chicken, winter melon, bitter melon, red jujube, sea cucumber, or Chinese Hawthorn may only be available in traditional Chinese food markets. This implies that if individuals who live in areas where traditional Chinese food stores are less accessible, they may have to limit the use of these

traditional foods for treating or preventing diseases. Furthermore, although several Western nutritional concepts (e.g. fruits and vegetables are rich in vitamins and fiber, liver is rich in iron) were stated, participants tended to apply these Western ideas in the context of giving additional rationalization for traditional Chinese remedies, rather than accepting one system and rejecting the other.

Another interesting finding was that most of these functional foods were often mixed with other ingredients or herbs and were prepared in the form of soups. In fact, soup is an essential Cantonese cuisine, which is believed to help alleviate a particular problem or symptom. Chinese people prefer to drink the liquid soups rather than eating solid substances because liquid is generally thought to be more easily absorbed by the body, and most of the beneficial energy of the tonic food is considered to have gone into soup after its long boiling process. However, according to the Western nutritional perspective, the prolonged boiling and heating process of making soups may destroy some nutrients such as vitamins B and C, and dietary folates (Better Health Channel, 2006). Nowadays, hospitals and long term care often use commercial or pre-made soups instead of making soups from scratch due to economical and/or nutritional reasons. However, the quality of these commercial soups may not meet with the expectations of their Chinese clients.

Perceptions of Western and Chinese Foods

In this study, variety, taste, portion size, food quality and freshness, health beliefs, nutritional values, convenience and family members' preferences were the key factors influencing participants' food choices. These factors were stated in other studies, but other predictors such as food cost and availability were also mentioned by these researchers (Santia et al., 2000; Lv & Cason, 2004). Our participants did not point out these two factors probably

because of the fact that Chinese foods are readily available in Toronto, not only in traditional Chinese grocery stores but also in the mainstream food markets. In addition, more than half of the participants had a relatively higher socioeconomic status (54% graduated with a college or university degree) and were able to afford Chinese foods. Although cost and availability do not seem to be major barriers to maintaining a Chinese diet among our participants, they could be more important in areas where traditional Chinese foods are less accessible or expensive, or among lower income immigrants who may have financial and time constraints.

Refer to the previous Section 5.1.1: Participants' Dietary Patterns for discussion on how participants integrated Western foods into their diet.

Objective # 5: To identify:

a) Where participants obtain primary source(s) of nutrition information

It was found that a majority of the participants obtained nutrition information through Chinese media (e.g. television, radio, newspapers, and magazines), friends and family. Some participants seek nutritional advice from their family doctors, dietitians, and books, but none reported that they had received health and nutrition information from the government.

Our findings imply that Chinese media, including television, radio, newspapers, and magazines may be an effective channel for delivering nutrition information to Chinese Canadians. A recent study conducted by the American Dietetic Association reported that the public is continuously bombarded with an overwhelming amount of food and nutrition information, and oftentimes, it is not always clear how to distinguish between nutrition facts and nutrition misinformation (Ayoob, Duyff, & Quagliani, 2002). Although not mentioned by our participants, the emergence of the Internet has become another main source of health and nutrition information for the public, reflecting the fact that consumers are taking more

responsibility for researching and participating in their own health decisions. However, since most information appearing on Web sites is not governed by any regulatory agency, it is likely that much of these information are not accurate (Risk & Dzenoqagis, 2004), and would be difficult for immigrants (particularly those who are not very fluent in English) to sort out facts from myths. Nutrition misinformation including food faddism, health fraud, or misdirected claims can be detrimental to consumers' health and their overall well-being (Vozenilek, 1998). Therefore, it is very important for immigrants to have access to the right source of information for them to make informed decisions.

In this study, very few participants (especially males) had ever sought nutrition and health advice from dietetics professionals before, and many of them were not familiar with the roles of dietitians. This suggests that there is an urgent need for dietetic professionals to increase their credibility and visibility in the public, especially among the minority populations; to advocate and provide sound, science-based nutrition information to the public to correct for nutrition misinformation. In order to achieve these goals, more research study is needed to explore the eating patterns, health beliefs, and the extent of dietary acculturation of Chinese Canadian immigrants, and to determine the health implications associated with dietary changes. University curricula and dietetic training programs should include cross-cultural courses to increase dietetics students' and dietitians' awareness of immigrants' unique needs. Moreover, fieldwork and dietetic rotations in ethnic communities would be helpful to prepare dietitians to work in multicultural settings. Cross-cultural seminars, workshops and conferences would provide excellent opportunities for dietitians to deliver sound nutrition messages to people in diverse ethnic groups (Varghese, 2002).

b) How often participants perform light intensity of physical activities for at least an hour per day in duration

The frequency of physical activities was reported by all but one participant. Only 30% of participants reported engaging in at least 60 minutes of light intensity activities daily as recommended by the Canada's Physical Activity Guide (Public Health Agency of Canada, 2003). Twenty-three percent reported not engaging in any regular physical activity or only exercising once a week, and were classified as sedentary. This finding was comparable to the 2000/01 Canadian Community Health Survey (CCHS), in which 56% of Canadians (20 and older) were inactive, accumulating on average less than 1.5 METs of physical activity daily (METs stands for metabolic equivalent that measures physical activity intensity. Any activity that burns 3 to 6 METs is considered moderate intensity, whereas any activity that burns more than 6 METs is considered vigorous intensity). This 1.5 METs correspond to walking in a total of half an hour a day. Only 24% were classified as moderately active, and 20% were active (CFLRI, 2002).

In contrast to some earlier studies (CFLRI, 2002; Chen & Mao, 2006), male participants in our study tended to be less physically active than their female counterparts. However, based on the data collected from this study it is not possible to determine why men may engage in less frequent physical activities than women. One possible explanation might be that men are generally less health conscious than women and may not recognize the health benefits of exercising. Secondly, there might be fewer culturally appropriate and gender specific programs that targeted on male immigrants. As a result, this discouraged men from exercising regularly. Thirdly, this research study only assessed the frequency of subjects participating in light intensity of exercise. Men, in general, are more likely than women to play sport games. The amount of time spent participating in these more vigorous activities was not determined. Perhaps a seven-

day physical activity recall, which is not part of this present cross-sectional study, would provide more accurate information in assessing the type of physical activity, intensity and duration. It may also be helpful to provide immigrants information about the health benefits of physical activity, as well as to implement some year-long physical activity programs that tailor individuals' needs and address the concerns related to convenience, accessibility and safety.

c) *Whether or not participants have difficulties in getting access to oriental foods of their choice*

This study took place in Toronto, Ontario, a multicultural city with approximately half a million Chinese immigrants (Statistics Canada, 2001). Due to the large number of Chinese population, local Chinese communities and food markets have been well developed. Therefore, as anticipated, Chinese foods were reported to be widely available within participants' local communities. However, we realized that some Chinese immigrants in certain parts of Canada would not have readily access to ethnic Chinese foods. We would expect these people to be more readily acculturated due to the necessity to adapt to the Canadian way of life. While these people would loss some of their Chinese identity, they would have greater cross-cultural interactions and become a closer member of their Canadian community.

d) *Whether or not some participants experience a lack of social or economic access to adequate food, resulting in food insecurity*

Food insecurity is defined by the USDA as the "limited or uncertain availability of nutritionally adequate or safe foods or the uncertain ability to acquire acceptable foods in socially acceptable ways" (Andersen, 1990). The status of food security lies somewhere along a continuum that extends from complete food security, food insecurity without hunger, food insecurity with moderate hunger among adults but not involving children, and food insecurity

with severe hunger among adults and children (Nord, 2004). Research shows that mothers in food insecure households are likely to compromise their own diet to ensure their children have sufficient foods (McIntyre, Glanville, Raine, Dayle, Anderson & Battaglia, 2003).

The majority of our participants were able to acquire the available foods. However, relatively younger subjects who had lower educational attainment and English proficiency stated that they had worried about not having enough money to buy foods in the past month. Previous research by others showed that several household factors were significantly related to food insecurity. These factors, which are related to low income and low income potential, included: lack of money and ability to buy foods, lack of transportation, inadequate food distribution within the community, and inadequate food choices (Kalina, 2001; Olson, Rauschenbach, Frongillo & Kendall, 1997). The issue of food insecurity is beyond the scope of this study, but a detailed assessment, perhaps using the 18-item USDA Food Security Scale, may be helpful to identify the problem in a future study.

Research Hypotheses

Hypothesis # 1: Older Chinese immigrants are more likely to follow traditional health beliefs of balancing the Yin and Yang foods than their younger counterparts.

Traditional Health Beliefs

In contrast to previous studies conducted by Wu-Tso, Yeh and Tam (1995), Satia (2001a) and Pan, Dixon, Himburg and Huffman (1999), which showed that younger immigrants tend to change their food habits and health beliefs more readily than older immigrants, our study did not find any significant relationships between participants' age and their degrees of traditional health beliefs. Such discrepancy of results may be due to age differences or geographic locations among different study populations. For example, all these previous studies (cited above) took

place in the United States among diverse Asian American groups, including Chinese (who were born in China, Taiwan, and Hong Kong), Japanese, Korean, and Vietnamese who were aged 18 to 84 years. Such differences in demographic characteristics among these research studies may affect whether or not participants follow their traditional health beliefs.

Hypothesis # 2: Immigrants who moved to the host country at an older age tend to have stronger traditional health beliefs than those who immigrated at a younger age.

Our results support the assumption that immigrants who moved to Canada at an older age (over 50 years) may have retained stronger traditional health beliefs than those who moved at a younger age (under 50 years). Individuals who came to Canada at older age were less likely to change their traditional beliefs and practices by their exposure to Canadian culture since they have spent a large portion of their lives in China. Many of them may have only attached to their own culture and have limited exposure to Canadian society. Therefore, the age of immigration plays an important role in determining how long traditional health beliefs can be preserved. A study conducted among 300 elderly people in the Yemenite neighbourhoods in Israel supported our findings. Researchers showed that immigrants who arrived to Israel over the age of 30, as compared to immigrants who migrated at an earlier age and grew up in Israel, were more likely to use traditional Yemenite remedies and carry its traditional health beliefs (Nakar, Vinker, Kitai, Wertman & Weingarten, 2001).

Hypothesis # 3: Individuals with stronger traditional Chinese health beliefs are more likely to select traditional ethnic foods and to demonstrate traditional eating behaviours.

Although this study did not explicitly examine the consumption pattern and frequency of traditional Chinese foods, it is found that people with the strongest traditional Chinese health beliefs (THB-Strong) were more likely to express their opinions on how they used traditional

Chinese foods (e.g. Chinese black mushroom, ginseng, Chinese Angelica, winter melon, bitter melon, or sea cucumber), and tonic foods (e.g. chicken soups) to prevent against diseases and maintain good health than subjects in the THB-Moderate and THB-Weak groups. On the other hand, individuals who belonged to the THB-Weak group reported that they were skeptical of the Chinese system and would not intentionally use Chinese foods to prevent or treat a disease.

Hypothesis # 4: Less acculturated immigrants are more likely to exhibit healthful behaviours related to selecting reduced-fat diet, and consuming fruits and vegetables more often than more acculturated individuals.

Dietary Acculturation

Previous studies concluded that immigrants who are at a younger age, highly educated, have young children in the household, good English proficiency, and had spent most of their time in North America are more likely to be acculturated in terms of diet (Yang & Fox, 1979; Satia et al., 2000; Satia et al., 2001a; Lv & Cason, 2004; Chau, Lee, Tseng & Downes, 1990). Our results indicated that less acculturated participants (including those who were at an older age, lower level of education and English proficiency) tend to practice fat-reduced behaviors more often (e.g. reduced consumptions of deep-fried and fried foods, trimmed visible fats from meats and replaced lower fat for higher fat alternatives), but have reported less frequent intakes of potato and lettuce salad compared to more acculturated ones. This finding illustrates the fusion of two cultures in that fat-reduced behavior is a Western practice whereas lower consumption of potato and lettuce salad indicates adherence to greater preference for traditional foods.

Older people, in general, are more health conscious than younger people, and therefore, it is not surprising that they practiced substituting lower-fat alternatives for higher-fat foods, reducing the intakes of deep-fried and fried foods, and trimming visible fats from meat more

frequently than their younger counterparts. Higher educational attainment and better English proficiency were associated with more frequent consumption of potatoes and lettuce salads. One explanation may be that more acculturated individuals have expanded their food choices by adding some 'new' (Western) foods such as lettuce salad and potato into their existing (Chinese) diet, while retaining other traditional foods such as tofu and green leafy vegetables. Less acculturated individuals, on the other hand, may limit their dietary intakes to traditional Chinese foods and have made very few changes in their food choices since immigration. Also, the increased consumption frequency of potatoes among more acculturated participants may simply be the products of high-fat, salty snacks such as French fries or potato chips. Wu-Tso, Yeh, and Tam (1995) compared the dietary patterns between young and old Asian Americans, and found that the young Asians consumed more fast foods and drank more juices than old Asians. As a result of acculturation, the positive aspect of their traditional diets was replaced by negative aspects of the Western eating habits, with a diet that is high in fat and cholesterol, but low in fiber.

Discussed in Hypothesis #2, individuals who immigrated at a later age (less acculturated) tended to have stronger traditional health beliefs. Therefore, as predicted, these individuals would attempt to avoid foods that are too 'hot' or 'cold' in nature such as fried foods to maintain or restore harmony with their body systems. This study also found that subjects who have lived in Canada longer (more acculturated) tended to substitute manufactured low-fat foods for their higher-fat counterparts more frequently. Such result is understandable because more acculturated individuals are more likely to be influenced by the Western culture, and hence, become more familiar with lower fat alternatives of the food products than less acculturated individuals.

Our findings suggested that the process of dietary acculturation may involve both healthful (e.g. substitute lower fat foods for higher fat alternatives) and unhealthful changes (e.g. less frequently to practice other fat-reduced behaviors). In some studies of Chinese immigrants, higher degree of acculturation was found to be associated with an increased fruit and vegetable intake and more health promoting behaviors such as avoidance of dietary fat (Satia-Abouta, Patterson Kristal, Teh & Tu, 2002; Satia et al., 2001a). In contrast, other researchers reported a significant increase in consumption of fats and sweets, and decrease in fruit and vegetable consumptions among North American Chinese as a result of acculturation (Lee et al., 1994a; Yu, Harris, Gao, Gao & Wynder, 1991; Wu-Tso, Yeh & Tam, 1995).

Theoretical Framework

In this study, we adopted the WHOQOL-BREF quality of life assessment as a theoretical basis to explore the effect of diet and health practices on subjective quality of life. Four domains related to quality of life were used: Physical Health, Psychological, Social Relationships, and Environment, and two items on Overall Quality of Life and General Health. We did not use the Health-Related Quality of Life Theory, Sickness Impact Profile, Nottingham Health Profile, and the MOS SF-36 to assess health and QOL since these modules elaborated more on the impact of diseases rather than health (WHOQOL-BREF, 1996).

The major advantage with the WHOQOL instrument is that it provides the first definition of quality of life that would be applicable cross-culturally and could be used in broad-ranging ways including clinical trials, epidemiological research, policy making, and/or evaluation of healthcare services. All domains and facets described by WHO had been developed simultaneously and cross-culturally in 20 field centers around the world by patients with a range of diseases, by health professionals and healthy subjects of various cultural backgrounds. This

instrument was rigorously tested for its validity and reliability in each of the international field centers. Also, in this study, it was found that reliabilities of the four domains were good to excellent. For these reasons, we are confident that data generated from the WHOQOL assessments were sensitive to our Chinese population group residing in Toronto, Ontario.

This research study is one of the first few studies to directly relate the nutrition aspects with quality of life among healthy immigrants. Good nutrition plays a fundamental role in preserving health, quality of life and well-beings, and reducing the risk of chronic diseases. Our study has shown that a majority of the participants adopted healthy eating patterns and had strong intentions to practice fat-reduced behaviors, and choose fruits and vegetables on a regular basis. These participants generally reported good perceived physical health, psychological well-being, social relationships, environment, and were satisfied with their lives and general health.

In contrast, poor quality diets and unhealthy eating habits such as the consumption of foods high in fats and sweeteners, but low intake of fruits and vegetables are associated with rising rates of overweight, obesity, chronic diseases, like heart disease, diabetes, and some cancers (Cordain, Eaton, Sebastian, Mann, & Lindeberg, et al., 2005). These low quality diets are also associated with under nutrition in the form of micronutrient deficiency, which, in turn, lowers immune response, cognitive and other physiologic functions; decreases muscle strength, body weight and social responsiveness; increases mortality; and causes anxiety, irritability and apathy (Gabr, 1987).

Immigrants who have lower socioeconomic status are more likely to experience food insecurity (Kasper, Gupta, Tran, Cook & Meyers, 2000). The negative impacts of food insecurity on health and overall QOL have been well documented. It may lead to hunger, malnutrition, increased susceptibility to disease, and adverse medical outcomes among people

with preexisting chronic illnesses (Vailas, Nitzke, Becker & Gast, 1998; Campbell, 1991). Besides these health-related factors, food insecure individuals may also have poor home environment, financial stress, anxiety, low self-esteem, and lack of transportation and access to healthcare services, resources, and social support network. By identifying the effects of diet and health practices on the quality of life domains for individuals and groups of individuals, dietitians, health educators and other healthcare professionals can use this information to locate problem areas such that they can implement appropriate interventions to ultimately improve quality of life and health. For example, adopting the medical nutrition therapy recommendations that require a person to modify their eating habits will have an impact on the person's psychological, social and cultural ways of life (Barr & Schumacher, 2003). The role of dietitians, therefore, is essential in helping individuals maximizing their choices and quality of life involving foods (Dwyer, 1991).

Limitations

This study has a number of limitations. First, our sample size was relatively small (N = 106). A large portion of the participants were middle aged and originated from Mainland China and Hong Kong. It is possible that the sample did not include enough participants from Taiwan to make meaningful comparisons among different places of birth. Also, this study population had high educational attainment, with a mean level of completing some college. Therefore, individuals with low level of education may not have similar dietary patterns and health beliefs, and may perceive their quality of life differently. In addition, participants residing in Toronto, Ontario may be very different from other parts of the country with regard to availability and cost of traditional Chinese foods, the structure of Chinese communities, and accessibility to health

services, which may result in huge variations of dietary habits and attitudes towards overall quality of life. For these reasons, the findings of this study cannot be generalized to the entire Chinese immigrant population living in Canada.

The second limitation of the study was the self-reported nature of the data on body weight and height, physical activity patterns, quality of life, and dietary habits related to reduced-fat behaviors and frequency of fruits and vegetables consumption. Some participants might respond in a socially desirable manner such as underreporting their actual consumption frequency of high-fat foods and/or weight, while over-reporting their consumption frequency of fruits and vegetables, physical activity patterns, height and/or perceptions on quality of life. Also, due to large variation in food preparation methods, not all dietary practices and fruits and vegetables items were captured in the questionnaire. It can be speculated that individuals with greater interest in health and nutrition would be more inclined to participate in the study.

Thirdly, the cross-sectional nature of this study measured data at one point in time and is therefore, subject to recall bias. Participants may be influenced by a variety of factors that can intervene with their assessment on health beliefs, behaviors related to selecting reduced-fat diets, frequency of fruits and vegetables consumption, and perceived quality of life. Hence, the true underlying relationships among the quality of life, dietary and health belief factors may be undermined.

This study was not intended to assess actual intake of foods or nutritional adequacy of the diet, but to distinguish participants who frequently practiced fat-reduced behaviors, consumed fruits and vegetables from other less frequent consumers. The previous literature review indicated that Chinese might have difficulty estimating serving size mainly because they did not typically measure foods, and most of their foods were prepared in mixed dishes that made

estimation difficult (Lee, Lee, Ladenla, & Miike, 1994b; Satia-Abouta, Patterson, Kristal, Teh & Tu, 2002). Therefore, even the food records or a lengthy food frequency questionnaire may not capture accurate information and is time-consuming for participants to complete.

Combining Qualitative and Quantitative Paradigms

Traditionally, researchers only rely exclusively on either the qualitative or quantitative approach to analyze a problem. Quantitative methods are used to produce reliable, valid data that are usually generalizable to some larger population, whereas qualitative research is designed to provide the researcher with more detailed information on issues about which little is known (Satia et al., 2000). In this study, however, a combination of these two methodologies was used to provide us with a more complete picture of the issues to be addressed.

Since very little is known about dietary habits, health practices and perceived QOL of Chinese immigrants in Canada, the qualitative method was useful in elucidating the perceptions and attitudes on traditional Chinese health beliefs, Western and Chinese dietary habits, and the use of Chinese foods for maintaining and restoring health. It may also provide useful information needed for developing quantitative measures and planning the related interventions. Quantitative methods, on the other hand, helped to determine the relationships among key variables such as the effects of sociodemographic factors on traditional health beliefs, eating patterns, and perceived quality of life among the Chinese people after immigrating to Canada.

RECOMMENDATIONS

Nutrition Educators and Practitioners

Dietetics practitioners and health professionals who work with clients from diverse ethnic groups would benefit from a deeper understanding of their clients' cultural health beliefs, dietary habits, perceived quality of life, and an acknowledgement of respect for these practices. This study revealed that very few Chinese Canadians were familiar with the roles of dietitians nor had they ever consulted a dietitian for nutritional advice. The finding may increase the awareness of dietitians and nutrition educators to take a more proactive role in disseminating nutrition messages to the public, particularly the minority populations since they may often be overlooked. When designing nutrition education programs, nutrition educators should consider the individuals' preferences, food practices, and cultural beliefs to ensure that the programs are implemented in a culturally sensitive way. Nutrition information should also be relevant to genders, and to individuals of different age groups with varying levels of educational attainment. Educational materials should be designed in Chinese for immigrants with lower levels of English proficiency.

Less acculturated Chinese Canadians or those with strong traditional Chinese health beliefs should be encouraged to retain prior healthful food habits and traditional health beliefs, increase consumption of fruits and vegetables, and reduce dietary fat intakes. For the more acculturated Chinese Canadians or those who do not have strong traditional Chinese health beliefs, messages should focus on reducing the intakes of foods high in fats, sweets, fast foods, convenient foods, and soft drinks, and encourage them to make wise food choices by incorporating both healthy Chinese and Western foods. Although this study focused primarily

on Chinese Canadians, these same educational strategies could be valuable for other minority ethnic groups in Canada.

Future Research

This study lays the groundwork for further research on health beliefs, dietary practices, and perceived quality of life in Chinese Canadians. Future studies with larger samples of both men and women are needed to confirm our findings. It may also be interesting to see if these results can be replicated in different parts of Canada, or if similar results can be found among elderly people. It is also necessary for future research studies to integrate nutrition aspects and quality of life to obtain a more thorough picture about the individuals. This is because many diseases that impact on individual's health and functional status are nutrition related. Good nutrition is essential to promote quality of life and well-being of an individual by averting malnutrition, preventing dietary deficiency diseases, and promoting optimal functional status.

A detailed exploration on changes in dietary patterns after immigration may also be helpful. For example, food frequency questionnaires or interviewer guided dietary recall may maximize the reporting of all foods consumed. Focus group interviews can capture participants' opinions about health and diseases, how they apply diet therapy to prevent the onset of diseases, factors that influence food choices, and/or barriers to fruit and vegetable consumption such as economic concerns, or accessibility to grocery stores. Furthermore, physical activity patterns can be assessed by an instrument that can detect not only the type of physical activity, but also the duration and intensity of physical activity. A seven-day physical activity record or an instrument designed specifically for assessment of habitual physical activity may also be useful. Finally, this research provides an important basis needed to design and implement nutrition

interventions to encourage the maintenance of healthful traditional Chinese diet and its health beliefs, and the selection of healthy Western foods.

REFERENCES

AiZhen, Z., Yu Hong, W., & MacLennan, R. (2004). Cuisine: the concept and its health and nutrition implications--a Hangzhou perspective. *Asia Pacific Journal of Clinical Nutrition,* 13(2):136-40.

Ali, J.S., McDermott, S., Gravel, R.G. (2004). Recent research on immigrant health from statistics Canada's population surveys. *Canadian Journal of Public Health*, 95(3):I9-13.

Amarantos, E., Martinez, A., & Dwyer, J. (2001). Nutrition and quality of life in older adults. *Journal of Gerontology*, 56A, 54-64.

American Thoracic Society. (2004). Quality of life resources. Retrieved December 10, 2004, from http://www.atsqol.org/key.asp

Anderson, A. (1990). Core indicators of nutritional state for difficult to sample populations. *The Journal of Nutrition*, 120:1557S-1600S

Ang, C.Y.W., Liu, K., & Huang YW. (1999). *Asian Foods: Science and Technology.* Technomic Publishing Company. (pp.409-530)

Aroian, K.J. & Norris, A. (2002). Assessing risk for depression among immigrants at two-year follow-up. *Archives of psychiatric nursing*, 16(6):245-53.

Ayoob, K.T., Duyff, R.L., & Quagliani, D. (2002). Food and nutrition misinformation. *Journal of the American Dietetic Association*, 102:260-66.

Ball, K., Crawford, D., Kenardy, J. (2004). Longitudinal relationships among overweight, life satisfaction, and aspirations in young women. *Obesity Research*, 12:1019-1030.

Barr, J.T., & Schumacher, G.E. (2003). The need for a nutrition-related quality-of-life measure. *Journal of the American Dietetic Association*, 103(2), 177-180.

Berry, J.W. (1980). Social and cultural change. In: Trandis HC, Brislin R, eds. *Handbook of Cross-cultural Psychology*. Boston, Mass; Allyn and Bacon.

Better Health Channel. (2006). Food processing and nutrition. Retrieved April 30, 2006, from http://www.betterhealth.vic.gov.au/BHCV2/bhcArticles.nsf/pages/Food_processing_and_nutrition?OpenDocument

Bhugra D., & Becker, M.A. (2005) Migration, cultural bereavement and cultural identity. *World Psychiatry*, 4(1):18-24.

Blehar MD, Oren DA (1997). Gender differences in depression. *Medscape Women's Health*, 1997;2:3. Revised from: Women's increased vulnerability to mood disorders: Integrating psychobiology and epidemiology. *Depression*, 1995;3:3-12.

Borchardt, JK. (2003). Traditional Chinese drug therapy. *Drug News & Perspectives,* 16(10):698-702.

Brown, D.W., Balluz, L.S., Heath, G.W., Moriarty, D.G., Ford, E.S., Giles, W.H., et al. (2003). Associations between recommended levels of physical activity and health-related quality of life. Findings from the 2001 Behavioral Risk Factor Surveillance System (BRFSS) survey. *Preventive Medicine*, 37(5):520-528.

Campbell, C. (1991). Food insecurity: a nutritional outcome or a predictor variable? *Journal of Nutrition*, 121, 408-15.

Campbell, T.C., Parpia, B., & Chen, J. (1998). Diet, lifestyle, and the etiology of coronary artery disease: the Cornell China study. *American Journal of Cardiology*, 82, 18T-21T.

Campbell, T., & Chang, B. (1981). *Health care of the Chinese in America.* In Henderson G, Primeaux M (Eds). Transcultaral Nursing. Menlo Park CA, Addison-Wesley.

Canadian Fitness and Lifestyle Research Institute (2002). Physical Activity Monitor. Retrieved March 20, 2006, from http://www.cflri.ca/cflri/pa/surveys/2002survey/2002survey.html#adults

Canadian Institute for Health Information. (2006). Improving the Health of Canadians: Promoting healthy Weights. Canadian Population Health Initiative. Ottawa, Ontario. Retrieved May 9, 2006, from http://secure.cihi.ca/cihiweb/products/healthyweights06_e.pdf

Centre for Health Promotion. (2000). Community quality of life project: a health promotion approach to understanding communities. University of Toronto. Retrieved October 16, 2004, from http://www.utoronto.ca/qol/concepts.htm

Chan, K. (2005). Chinese medicinal materials and their interface with Western medical concepts. Journal of Ethnopharmacology, 96(1-2): 1-18.

Chan, N., & Lin, K. (2000). Chinese food cultural profile. Retrieved October 5, 2004, from http://www.ethnomed.org/ethnomed/cultures/chinese/chinese_food.html

Chan, M.F., Mok, E., Wong, Y.S., Tong, T.F., Day, M.C., Tang, C.K.Y., et al. (2003). Attitudes of Hong Kong Chinese to traditional Chinese medicine and Western medicine: survey and cluster analysis. *Complementary Therapies in Medicine*, 11, 103-9.

Chan-Ho, S.Y. (1985). Dietary beliefs in health and illness among a Hong Kong community. *Social Science and Medicine*, 20(3), 223-30.

Chang, B. (1974). Some dietary beliefs in Chinese folk culture. *Journal of the American Dietetic Association*, 65, 436-8.

Chau, P., Lee, H.S., Tseng, R., & Downes, N.J. (1990). Dietary habits, health beliefs, and food practices of elderly Chinese women. *Journal of the American Dietetic Association*, 90(4), 579-80.

Che, J., & Chen, J. (2001). Food insecurity in Canadian households. *Health Reports*, 12(4):11-22, catalogue no. 82-003.

Chen, J., & Gao, J.Q. (1993). The Chinese total diet study in 1990. Part II. Nutrients. *Journal of AOAC International*, 76(6), 1206-1213.

Chen, Y., & Mao, Y. (2006). Obesity and leisure time physical activity among Canadians. Preventive Medicine, Feb 11.

Chinese Business Guide: Toronto, Montreal, Vancouver, Edmonton, Calgary, and Victoria. 2003-2004 Edition. Canada Post Agreement No.: 40764551.

Chinese Interagency Network of Greater Toronto: Social and Health Services Directory (2004). Sponsored (printed and distributed) by Sing Tao Daily Newspaper.

Cordain, L., Eaton, S.B., Sebastian, A., Mann, N., Lindeberg, S., et al. (2005). Origins and evolution of the Western diet: health implications for the 21st century. *American Journal of Clinical Nutrition*, 82(2):341-54.

Dahl, M. (2004). Nutrition for Chinese populations. *Health Care Food & Nutrition Focus*, 21(4), 8-9.

Dai, Y., & Luo, X. (1996). Functional food in China. *Nutrition Reveiws*, 54(11), S21-23.

De Vaus, D. (2004). Analyzing Social Science Data, 50 Key Problems in Data Analysis. Sage Publications Ltd, London.

Deurenberg, P., Deurenberg-Yap, M., & Guricci, S. (2002). Asians are different from Caucasians and from each other in their body mass index/body fat per cent relationship. *Obesity Reviews*, 3:141-46.

Drewnowski, A., & Evans, W.J. (2001). Nutrition, physical activity, and quality of life in older adults: summary. *Journal of Gerontology*, 56A, 89-94.

Dwyer, J.T. (1991). Bringing ADA's strategic plan to life: choice, caring, compassion, collaboration, and compensation. *Journal of the American Dietetics Association*, 91:1061-4.

Farquhar, M. (1995). Elderly people's definitions of quality of life. *Social Science and Medicine*, 41(10), 1439-46.

Food and Agriculture Organization (2000). The state of food insecurity in the world (SOFI). The United Nations. Retrieved November 17, 2004, from http://plaza.ufl.edu/mmcadams/global/steph_b/compo4.htm

Ford, E.S., Kohl, H.W. 3rd, Mokdad, A.H., & Ajani, U.A. (2005). Sedentary behavior, physical activity, and the metabolic syndrome among U.S. adults. *Obesity Research*, 13(3):608-14.

Gabr, M. (1987). Undernutrition and quality of life. *World Review of Nutrition and Dietetics*, 49:1-21.

Gee, E.M., Kobayashi, K.M., Prus, S.G. (2003). Examining the "healthy immigrant effect" in later life: findings from the Canadian Community Health Survey. SEDAP Research Paper No. 98. Retrieved April 10, 2006, from http://socserv2.socsci.mcmaster.ca/~sedap/p/sedap98.pdf

Gielen, A.C., & McDonald, E.M. (1997). *The PRECEDE-PROCEED Planning Model.* In: Glanz K, Lewis FM & Rimer BK, Eds. Health Behaviour and Health Education: Theory, Research, and Practice, 2nd ed. San Francisco: Jossey-Bass Inc, (pp359-83).

Godoy, R., Redstone, I., Islam, F., Price, T., Saeed, A., Tabassum, S. (2001). English proficiency and quality of life among Puerto Ricans: Does it matter? Sustainable International Development Program, Heller Graduate School, Brandeis University, USA.

Gravetter, F. J., & Wallnau, L. B. (2004). Statistics for the behavioral sciences: A first course for students in psychology and education, sixth edition. Belmont, CA: Thomson/Wadsworth.

Hassan, M.K., Joshi, A.V., Madhavan, S.S., Amonkar, M.M. (2003). Obesity and health-related quality of life: a cross-sectional analysis of the US population. *International Journal of Obesity and Related Metabolic Disorders*, 27(10):1227-1232.

Havas, S., Heimendinger, J., Damron, D., Nicklas, T.A., Cowan, A., Beresford, S.A.A., et al. (1995). 5 a day for better health-nine community research projects to increase fruit and vegetable consumption. *Public Health Reports*, 110(1), 68-79.

Health Canada. *Final Policy Paper on Nutraceuticals/Functional Foods and Health Claims on Foods.* (1998). Retrieved October 24, 2004, from http://www.hc-sc.gc.ca/food-aliment/ns-sc/ne-en/health_claims-allegations_sante/e_nutr-funct_foods.html

Healthy People 2010: Retrieved October 12, 2004, from http://www.healthypeople.gov/about/whatis.htm

Higginson, I.J., & Carr, A.J. (2001). Using quality of life measures in the clinical setting. *British Medical Journal*, 322, 1297-300.

Hill, A., Williams, J. (1998) Psychological health in a non-clinical sample of obese women *International Journal of Obesity and Related Metabolic Disorders*, 22,578-583.

Hovey, J.D. (1999). Psychosocial predictors of acculturative stress in Central American immigrants. *Journal of Immigrant Health*, 1(4):187-94.

Hsu-Hage, B.H., Ibiebele, T., Wahlqvist, M.L.(1995). Food intakes of adult Melbourne Chinese. *Australian Journal of Public Health*,19(6):623-8.

Huth, P.J., DiRienzo, D.B., Miller, G.D. (2006). Major scientific advances with dairy foods in nutrition and health. *Journal of Dairy Science*, 89(4):1207-21.

Kalina, L. (2001). Chapter One: Food Security. *Building Food Security in Canada. From Hunger to Sustainable Food Systems: A Community Guide*, 9-20.

Kang, S.M., Shaver, P.R, Sue, S., et al. (2003). Culture-specific patterns in the prediction of life satisfaction: roles of emotion, relationship quality, and self-esteem. *Personality and Social Psychology Bulletin*, 29(12):1596-608.

Kasper, J., Gupta, S.K., Tran, P., Cook, J.T., & Meyers, A.F. (2000). Hunger in legal immigrants in California, Texas, and Illinois. *American Journal of Public Health*, 90(10), 1629-33.

Kimberling, R., & Ouimette, P. (Eds.). (2002). *Gender and PTSD.* New York: Guilford.

Kogut, B.D. (1998). Language ability, US labor market experience and the earnings of immigrants. International Journal of Manpower, 19(5):319-27.

Koo, L.C. (1984). The use of food to treat and prevent disease in Chinese culture. *Social Science Medicine*, 18(9), 757-66.

Lam, T.P. (2001). Strengths and weaknesses of traditional Chinese medicine and Western medicine in the eyes of some Hong Kong Chinese. *Journal of Epidemiology Community Health*, 55, 762-65.

Lamb, K.A., Lee, G.R., & DeMarris, A. (2003). Union formation and depression: Selection and relationship effects. *Journal of Marriage and Family*, 65(4):953-62.

Larsson, U., Karlsson, J., Sullivan, M. (2002). Impact of overweight and obesity on health-related quality of life--a Swedish population study. *International Journal of Obesity and Related Metabolic Disorders*, 26(3):417-424.

Lauer, G. (1999) *Concepts of quality of life in mental health care.* In Quality of Life and Mental Health Care (eds S. Priebe, J. P. J. Oliver & W. Kaiser), pp. 19 -34. Philadelphia, PA: Wrightson Biomedical.

Lee, M.M., Wu-Williams, A., Whittemore, A.S., Zheng, S., Gallagher, R., Teh, C.Z., et al., (1994a). Comparison of dietary habits, physical activity and body size among Chinese in North America and China. *International Journal of Epidemiology*, 23(5), 984-90.

Lee, M.M., Lee, F., Ladenla, S.W., & Miike, R. (1994b). A semiquantitative dietary history questionnaire for Chinese Americans. *Annals of Epidemiology*, 4(3),188-97.

Leon, R.L. (2002). Hazards in opportunity. *Journal of Immigrant Health*, 4(2):111-5.

Leung, K.K., Wu, E.C., Leu, B.H., Tang, L.Y. (2004). The use of focus group in evaluating quality of life components among elderly Chinese people. *Quality of Life Research*, 13:179-90.

Liou, D., (2004). Influence of Self-Efficacy on Fat-Related Dietary Behavior in Chinese Americans. *The International Electronic Journal of Health Education* (www.iejhe.org), 7: 27-37.

Ludman, E.K., & Newman, I.M. (1984). Yin and Yang in the health-related food practices of three Chinese groups. *Journal of Nutrition Education*, 16(1), 3.

Lv, N. & Cason, K.L. (2004). Dietary pattern change and acculturation of Chinese Americans in Pennsylvania. *Journal of the American Dietetic Association*, 104, 771-8.

Mayo Clinic Staff (2004). Healthy marriage: Why love is good for you. Mayo Foundation for Medical Education and Research, Retrieved April 10, 2006, from http://www.mayoclinic.com/health/healthy-marriage/MH00108

McDonald, J.T., & Kennedy, S. (2005). Is migration to Canada associated with unhealthy weight gain? Overweight and obesity among Canada's immigrants. *Social Science and Medicine*, 61(12):2469-81.

McIntyre, L., Glanville, N.T., Raine, K.D., Dayle, J.B., Anderson, B., & Battaglia, N. (2003). Do low-income lone mothers compromise their nutrition to feed their children? *Canadian Medical Association Journal*, 168(6):686-91.

Miller, A.M., Sorokin, O., Want, E., Feetham, S., Choi, M., Wilbur, J. (2006). Acculturation, social alienation, and depressed mood in midlife women from the former Soviet Union. *Research in Nursing and Health*, 29(2):134-46.

Misra, A. (2003). Revisions of cutoffs of body mass index to define overweight and obesity are needed for the Asian-ethnic groups. *International Journal of Obesity*, 27:1294-6.

Naker, S., Vinker, S., Kitai, E., Wertman, E., Weingarten, M. (2001). Folk, traditional and conventional medicine among elderly Yemenite immigrants in Israel. *Immigration and Health*, 3:928-32.

Netz, Y. & Wu, M.J. (2005). Physical activity and psychological well-being in advanced age: a meta-analysis of intervention study. *Psychology and Aging*, 20(2):272-84.

Nord, M. (2004). Food security in the United States: measuring household food security. Economic Research Service. United States Department of Agriculture, the Economics of Food, Farming, Natural Resources, and Rural America. Retrieved March 28, 2006, from http://www.ers.usda.gov/briefing/FoodSecurity/measurement/

Nothwehr, F. & Peterson, N.A. (2005). Healthy eating and exercise: strategies for weight management in the rural Midwest. *Health Education and Behavior*, 32(2):253-63.

Olson, C.M., Rauschenbach, B.S., Frongillo, E.A., Jr., & Kendall, A. (1997). Factors contributing to household food insecurity in a rural upstate New York county. Family Economics and Nutrition Review, 10(2), 2-17.

Pan, Y.L., Dixon, Z., Himburg, S., & Huffman F. (1999). Asian students change their eating patterns after living in the United States. *Journal of the American Dietetic Association*, 99(1), 54-57.

Park, J.H. (1999) The earnings of immigrants in the US: The effect of English-speaking ability. *American Journal of Economics and Sociology*, 58(1):43-56.

Power, M., Bullinger, M., & Harper, A. (1999). WHO Quality of life group. The World Health Organization WHOQOL-100: tests of the universality of quality of life in 15 different cultural groups worldwide. *Health Psychology*, 18, 495-505.

Public Health Agency of Canada (2003). Physical Activity Guide. Retrieved May 10, 2006, from http://www.phac-aspc.gc.ca/pau-uap/paguide/index.html

Quality of Life Research Centre, Copenhagen, Denmark. Retrieved October 23, 2004, from http://www.fclk.dk/english/index.asp?id=2

Rejeski, W.J., Mihalko, S.L. (2001). Physical activity and quality of life in older adults. *Journal of Gerontology Biological Sciences and Medical Sciences*, 56A, 23-35.

Risk, A., & Dzenoqagis, J. (2004). Review of internet health information quality initiatives. World Health Organization. Retrieved April 10, 2006, from http://www.jmir.org/2001/4/e28/

Rogerson, R.J. (1995). Environmental and health-related quality of life: conceptual and methodological similarities. *Social Science and Medicine*, 41(10), 1373-82.

Sarvimaki, A. (2000). Quality of life in old age described as a sense of well-being, meaning and value. *Journal of Advanced Nursing*, 32(4),1025-33.

Satia, J.A., Patterson, R.E., Taylor, V.M., Cheney, C.L., Shiu-Thornton, S., Chitnarong, K, et al., (2000). Use of qualitative methods to study diet, acculturation, and health in Chinese-American women. *Journal of the American Dietetic Association*, 100(8), 934-40.

Satia, J.A., Patterson, R.E., Kristal, A.R., Hislop, T.G., Yasui, Y., Taylor, V.M., et al. (2001a). Development of scales to measure dietary acculturation among Chinese-Americans and Chinese-Canadians. *Journal of the American Dietetic Association*, 101(5):548-53.

Satia, J.A., Patterson, R.E., Kristal, A.R., Hislop, T.G., & Pineda, M. (2001b). A household food inventory for North American Chinese. *Public Health Nutrition*, 4(2):241-7.

Satia-Abouta, J., Patterson, R.E., Kristal, A.R., Teh, C., Tu, S.P. (2002). Psychosocial predictors of diet and acculturation in Chinese American and Chinese Canadian Women. *Ethnicity & Health*, 7(1):21-39.

Shannon J., Kristal A.R., Curry S.J., Beresford SA. (1997). Application of a behavioral approach to measuring dietary change: the fat- and fiber-related diet behavior questionnaire. *Cancer Epidemiology Biomarkers Preview*, 6:355-61.

Shatenstein, B., & Ghadirian, P. (1998). Influences on diet, health behaviours and their outcome in select ethnocultural and religious groups. *Nutrition*, 14(2):223-30.

Statistics Canada. (2001). *Census Report*. Retrieved October 3, 2004, from http://www12.statcan.ca/english/census01/products/analytic/companion/etoimm/canada.cfm#chinese_largest_visible_minority

Szapocznik, J., & Kurtines, W. (1980). Acculturation, biculturalism, and adjustment among Cuban Americans. In: Padilla AM, ed. Acculturation: Theory, Models, and Some New Findings. Boulder, Colo:Westview; (pp.130-59).

Tan, S.P., & Wheeler, E. (1983). Concepts relating to health and food held by Chinese women in London. *Ecology of Food and Nutrition*, 13:37-49.

The Australian Centre for Posttraumatic Mental Health (2003). About the Australia WHOQOL-BREF. Retrieved January 3, 2006, from http://www.acpmh.unimelb.edu.au/whoqol/whoqol-bref_14.html

Toronto Public Health (2004). Retrieved October 6, 2004, from http://www.city.toronto.ca/outcity/profile02.htm#1.

Varghese, S. (2002). Dietary acculturation and health-related issues of Indian immigrant families in Newfoundland. Canadian Journal of Dietetic Practice and Research, 63(2):72-8.

Vailas, L.I., Nitzke, S.A., Becker, M., & Gast, J. (1998). Risk indicators for malnutrition are associated inversely with quality of life for patients in meal programs for older adults. *Journal of the American Dietetic Association*, 98(5), 548-53.

Ventegodt, S., Merrick, J., & Andersen, N.J. (2003). Quality of life theory I. The IQOL theory: An integrative theory of the global quality of life concept. *The Scientific World Journal*, 3, 1030-40.

Vozenilek G. (1998). The wheat from the chaff: Sorting out nutrition information on the Internet. *Journal of the American Dietetic Association,* 98:1270-1272.

Weng. (1999). *An outline of traditional Chinese medical nutrition.* Retrieved October 6, 2004, from http://www.zhenjiu.de/Literatur/Fachartikel/nutrition.htm

Weng, W., & Chen, J. (1996). The eastern perspective on functional foods based on traditional Chinese medicine. *Nutrition Reviews*, 54(11), S11-16.

Whittemore, A.S., Wu-Williams, A.M., Lee, M. (1990). Diet, physical activity and colorectal cancer among Chinese in North America and China. *Journal of the National Cancer Institute*, 82, 915-26.

Whittemore, A.S., Kolonel, L.N., Wu, A.H., John, E.M., Gallagher, R.P., Howe, G.R., et al. (1995). Prostate cancer in relation to diet, physical activity, and body size in blacks, whites, and Asians in the United States and Canada. *Journal of the National Cancer Institute*, 87, 652-61.

Wikby, K., & Fagerskiold, A. (2004). The willingness to eat. An investigation of appetite among elderly people. *Scan Journal of Caring Science*, 18, 20-27.

Wildman, R.P., Gu, D., Reynolds, K., Duan, X., He, J. (2004). Appropriate body mass index and waist circumference cutoffs for categorization of overweight and central adiposity among Chinese adults. *American Journal of Clinical Nutrition*, 80:1129-36.

Wilson, E., Chen, A.H., Grumbach, K, Wang, F., Fernandez, A. (2005). Effects of limited English proficiency and physician language on health care comprehension. *Journal of General Internal Medicine*, 20(9):800-6.

Wong, S.T., Yoo, G.J., Stewart, A.L. (2005). Examining the types of social support and the actual sources of support in older Chinese and Korean immigrants. *International Journal of Aging and Human Development*, 61(2):105-21.

Woo, J., Leung, S.S., Ho, S.C., Sham, A., Lam, T.H., Janus, E.D. (1999). Influence of education level and marital status on dietary intake, obesity and other cardiovascular risk factors in a Hong Kong Chinese population. *European Journal of Clinical Nutrition*, 53(6):461-7.

Woo, J., Woo, K.S., Leung, S.S.F., Chook, P., Liu, B., Ip, R., et al. (2001). The Mediterranean score of dietary habits in Chinese populations in four different geographical areas. *European Journal of Clinical Nutrition*, 55, 215-20.

Woo, K.S., & Donnan, S.P.B. (1989). Epidemiology and coronary arterial disease in the Chinese. *International Journal of Cardiology*, 24, 83-93.

Woo, J., Leung, S.S.F., Ho, S.C., & Chan, S.M. (1999). Is there a typical Chinese diet and what are the health implications? *Ecology of Food and Nutrition*, 38, 491-503.

World Health Organization. (1990). Diet, Nutrition, and the Prevention of Chronic Diseases. Geneva: World Health Organization.

World Health Organization. (1998). The World Health Organization Quality-of-Life Assessment (WHQOL): development and general psychometric properties. *Social Science Medicine*, 46, 1569-85.

WHOQOL- BREF. The World Health Organization. Retrieved October 20, 2004, from http://www.who.int/substance_abuse/research_tools/whoqolbref/en/

WHOQOL-BREF (1996). Introduction, administration, scoring and generic version of the assessment, field trial version. The World Health Organization. Retrieved November 21, 2004, from http://www.who.int/mental_health/media/en/76.pdf

WHOQOL-BREF (1998). Development of the World Health Organization WHOQOL-BREF Quality of Life Assessment. *Psychological Medicine*, 551-8.

Wu-Tso, P., Yeh, I.L., & Tam, C.F. (1995). Comparisons of dietary intake in young and old Asian Americans: a two-generation study. *Nutrition Research*, 15(10), 1445-62.

Yang, G.P., & Fox, H.M. (1979). Food habit changes of Chinese persons living in Lincoln, Nebraska. *Journal of the American Dietetic Association*, 75, 420-24.

Yu, E.S.H., Chang, C.F., Lui, W.T., & Kan, S.H. (1985). *Asian-White mortality differences: Are there excess deaths?* In: Heckler MM, ed. Report of the Secretary's Task Force on Black and Minority Health, Vol II: Crosscutting Issues in Minority Health. Washington DC: US Department of Health and Human Services; 209-51.

Yu, H., Harris, R.E., Gao, Y., Gao, R., & Wynder E. (1991). Comparative epidemiology of cancers of the colon, rectum, prostate and breast in Shanghai, China versus the United States. *International Journal of Epidemiology*, 20, 76-81.

Zhou, B.F. (2002). Effect of body mass index on all-cause mortality and incidence of cardiovascular diseases- report for meta-analysis of prospective studies on optimal cut-off points of body mass index in Chinese adults. *Biomedical and Environmental Sciences*, 15:245-52.

APPENDIX A

CHINESE ORGANIZATIONS IN THE GREATER TORONTO AREAS

Toronto:	1. Cantonese Musical Club
	2. Carefirst Seniors & Community Services Association (Toronto office)
	3. Cecil Community Centre
	4. Centre for Information & Community Services (Toronto office)
	5. Chinese Canadian Intercultural Association
	6. Chinese Canadian National Council Toronto Chapter
	7. Eastview Neighbourhood Community Centre
	8. Gerrard S.E.A.S. Centre
	9. Immigrant Women's Health Centre
	10. Lee's Family Association
	11. Mah Society of Toronto
	12. Queen West Community Health Centre
	13. Regent Park Community Health Centre
	14. Riverdale Immigrant Women Centre
	15. St. Christopher House
	16. St. Stephen's Community House
	17. Scadding Court Community Centre
	18. South Riverdale Community Health Centre
	19. Toronto Chinese Community Services Association
	20. University Settlement Recreation Centre
	21. Woodgreen Immigrant Services
North York:	22. Banfield Memorial Church
	23. Bayview Glen Church
	24. Chinese Evangelical Alliance Church of Toronto
	25. Chinese Information & Community Services
	26. Chinese Mandarin Christian Church
	27. East Toronto Chinese Baptist
	28. North York S.E.A.S. Centre
	29. North York Chinese Community Church
	30. Overseas Chinese Women Association
	31. Pon Yue Society
Mississauga:	32. The Chinese Association of Mississauga
	33. Toronto Chinese Community Services Association (Mississauga office)
Markham& Richmond Hill:	34. All Saints Anglican
	35. Bridle Trial Baptist Church
	36. Canadians Multicultural Links Association
	37. Carefirst Seniors & Community Services Association (Richmond Hill)
	38. Catholic Community Services of York Region
	39. Chinese Markham Cultural Centre
	40. Federation of Chinese Canadians in Markham

	41. Markham Chinese Cultural Centre of Federation of Chinese Canadians in Markham
	42. Spirit of Life
	43. Toronto Chinese Community Services Association (Markham office)
Scarborough:	44. Accessible Community Counselling & Employment Services
	45. Carefirst Seniors & Community Services Association (Scarborough office)
	46. Centre for Information & Community Service of Ontario
	47. Chinese Cultural Centre of Greater Toronto
	48. Chinese First Evangelical Baptist Church
	49. Scarborough Chinese Alliance Church
	50. Scarborough Community Care Access Centre
	51. Tang's Association of Ontario

APPENDIX B

SELECTION OF PARTICIPATING ORGANIZATIONS USING RANDOM NUMBER GENERATION METHOD

Toronto (2)	North York & Mississauga (1)	Markham & Richmond Hill (1)	Scarborough (1)
8	33	41	49
18	28	37	45
14	27	42	46
5	25	42	47
10	32	37	48
20	24	36	48
13	27	43	50
3	29	42	44
15	26	34	51
12	32	39	49

APPENDIX D

PARTICIPANTS' CONSENT FORM

Study Title: Dietary Habits, Health Beliefs and Quality of Life among Chinese-Canadians.

Purpose:

You are invited to participate in a research study entitled: "*Dietary Habits, Health Beliefs and Quality of Life among Chinese-Canadians.*" This study will help us learn more about Chinese-Canadians dietary habits, health beliefs and perceived quality of life, their experience of using Chinese foods in the prevention and treatment of a disease, and their attitudes on Western foods.

This study is conducted by Stephanie Kwok as part of a requirement to complete her Masters of Science Degree in Applied Human Nutrition at Mount Saint Vincent University in Halifax, Nova Scotia.

A total of 100 Chinese-Canadians between the ages of 45 and 64 will participate in this study.

Procedures:

Your participation is completely voluntary, and is greatly appreciated. You are eligible to participate if you are between the ages of 45 and 64; born in Mainland China, Hong Kong or Taiwan; and not on a medically prescribed diet, meal replacement or other dietary restrictions. If you agree to participate, you will be given a telephone interview between March and April 2005. The researcher will ask about your eating habits, health beliefs, quality of life, and your experience of using Chinese and Western foods for medical purposes. The interview will take approximately 15 to 20 minutes of your time.

Benefits:

While you may not benefit directly from this study, your contribution will help the healthcare professionals and dietitians increase their understanding of the Chinese cultural food practices, and improve their ability to counsel Chinese clients.

Risks:

There are no risks involved in this study. You may not like all the questions that you will be asked during the interview, but you are free to refuse to answer any specific question or terminate the interview at any time.

Compensation:

To acknowledge appreciation of your participation, you will receive a free Chinese Adaptation of Canada Food Guide to Healthy Eating and the Health Canada's Physical Activity Guide, which will be mailed to you on a later date. Also, you will have a chance to be selected in a raffle, to win a $20 gift certificate at the Toronto Shopping Centre.

Investigator:

Signature _____ Date _____

Name (please print) _____

A phone number where I can contact you: _____(in the day time)

_____(in the evening)

Which day and time do you prefer me to contact you? Day _____ Time _____

☐ Yes, I would like to receive a summary of the overall study results.

Address:_____

_____

APPENDIX E

PARTICIPANTS' CONSENT FORM (CHINESE VERSION)

華裔加拿大人飲食習慣、健康信念與生活水平研究參加同意書

研究目的：

您被邀請參加這個名為「華裔加拿大人飲食習慣、健康信念與生活水平」的研究。此研究的目的是為了更深入地了解您的飲食習慣，健康信念，您對生活水平的評估，您運用中國食物來保健養生和治療疾病的經驗，以及您對西方食物的看法。

此研究由 Stephanie Kwok (郭小姐) 進行，以作為她完成理科碩士課程（新斯高沙省哈利法克斯市聖文森山大學應用人類營養學系要求的一部份。

大約一百位年齡介乎45歲至64歲的華裔加拿大人會參與此項研究。

研究程序：

參加這個研究是完全自願的。我們會非常感謝您的參與。如果您的年齡介乎45歲至64歲；在中國大陸、香港或台灣出生；不需要食用處方飲食或指定營養飲品以取代正餐 (Meal Replacement），或沒有任何飲食控制者則符合參加條件。如果您同意參加，研究員將於本年度三月至四月期間與您進行一次電話訪問，並詢問有關您的飲食習慣，健康信念，您對生活水平的評估，以及您應用中式食物和西方食物為治療作用的經驗。這個電話訪問大約需時十五至二十分鐘左右。

參加此研究的益處:

儘管您也許不能直接從中得到益處，您的參與卻能幫助醫務人員和營養師極大地提高他們對中國飲食文化習慣的認識，以及改善他們輔導華裔人仕的能力。

參加此研究沒有風險:

參加這研究是沒有風險的。在電話訪問中，您可能不喜歡某些問題。您可以拒絕回

答您不願回答的問題並且可以在任何時間停止參與此項研究。

答謝：

為了答謝您參加此項研究，稍後我們會寄給您一份適用於華人社區的「加拿大健康飲食指南」及一份加拿大衛生局印刷的「體育活動指南」，費用全免。同時，您亦會被加入抽獎名單內，有機會免費贏取一張多倫多百貨商場的二十元正購物禮卷。

保密：

您所有的資料是絕對保密的。研究員將會把您的答案輸入數據庫，自此以後，您的所有信息將會只以研究編碼形式來識別，絕對不會以記名方式來儲存資料。所有的研究信息將被鎖入文件櫃內。只有研究員能夠接觸收集資料及文件。

所有有關這個研究的報告或出版刊物只會以群體的結果出現，絕不會涉及個人。出版刊物及展示，絕不會提及參與者的姓名。

參與者的權利：

您的參與是完全自願的。您可以拒絕回答您不願回答的問題，並且可以在任何時間停止參與此研究。參加與否不會影響您的醫療保健。

研究結果：

稍後在參加同意書內，您會被問及是否願意收到整個研究結果的摘要。如果您喜歡，我們會把整份研究結果的摘要以郵遞方式寄給您。

諮詢：

如果您對這項研究有任何問題，請與我（郭小姐）（416）303-6615 或 Dr. Kwan Wong（論文顧問教授）（902）457-6295 聯絡。我的論文委員會成員還包括 Professor Linda Mann （聖文森山大學應用人類營養學系主席），她的電話號碼是（902）457-6146 及 Dr. Ilya Blum（聖文森山大學數學及電腦學系副教授），

他的電話號碼是（902）457-6520。如果您對這研究有倫理相關的問題，您可以致電（902）457-6296 給 Dr. Anthony Davis（聖文森山大學倫理部主任）。

我已經閱讀過這份參加同意書，研究員已經向我解釋這項研究。我有被給予機會發問問題使我更了解這項研究。我已經為自己保存了一份與此相同的同意書以作紀錄。我在此同意參與以上所提及的華裔加拿大人飲食習慣、健康信念與生活水平的研究，並同意接受郭小姐（新斯高沙省哈利法克斯市聖文森山大學碩士研究生）的訪問。

參與者：

參與者簽名：_____ 日期：_____

參與者姓名（請清楚寫下）：_____

研究員：

研究員簽名：_____ 日期：_____

研究員姓名（請清楚寫下）：_____

參加者聯絡電話：_____（白天）

_____（晚上）

您願意我在哪一天、哪個時間與您聯絡？

日期_____ 時間_____

□ 我希望收到整個研究結果的摘要。

參加者地址：_____

_____

APPENDIX H

QUESTIONNAIRE

SECTION I: The following questions ask about <u>your health beliefs</u>. Please provide your immediate reaction to the following statements. This is not a test, and there are no right or wrong answers. Please choose whether you "strongly agree", "agree", "neither agree nor disagree", "disagree" or "strongly disagree" to the following statements:

		Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
1.	I prefer to eat Western foods to Chinese foods.	1	2	3	4	5
2.	Western foods are, in general, less healthy than Chinese foods.	5	4	3	2	1
3.	I do not practice the balance of 'hot' and 'cold' (or *yin and yang*') foods in meals.	1	2	3	4	5
4.	An elderly person's body becomes "colder" and more prone to "cold" diseases.	5	4	3	2	1
5.	It is important to combine 'hot' and 'cold' foods for good health.	5	4	3	2	1
6.	Eating *yang* foods leads to higher energy level.	5	4	3	2	1
7.	*Yin* foods help get rid of extra internal body heat.	5	4	3	2	1
8.	Eating fried and greasy foods can cause cancer and heart disease.	5	4	3	2	1
9.	Healthy eating means eating 3 simple, regular meals with no snacks.	5	4	3	2	1
10.	Healthy eating also means no overeating and undereating.	5	4	3	2	1
11.	It is time consuming and troublesome to prepare Chinese meals.	1	2	3	4	5
12.	Suitable foods should be consumed during or after illness to facilitate recovery.	5	4	3	2	1
13.	Seasonal adjustment of diet is important for health maintenance.	5	4	3	2	1
14.	Some foods can cause 'wet', 'irritating' or' poisonous' reactions to the body.	5	4	3	2	1
15.	It is important to adjust food intake (*yin* and *yang* foods) to suit body constitution.	5	4	3	2	1
16.	Proper use of tonic can prevent illness.	5	4	3	2	1

		Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
17.	Some foods and herbs can counter the debilitating side effects of prescription drugs.	5	4	3	2	1
18.	Food can influence a person's temperament.	5	4	3	2	1
19.	It is easy to access Chinese foods and oriental food markets in my community.	5	4	3	2	1
20.	The cost of Chinese foods is, in general, more expensive in Canada than in China.	5	4	3	2	1

Coding: 9= refuse to answer

SECTION II: The following questions ask about <u>your eating habits</u>. Please choose the answer that best applies to you. There is no right or wrong answer.

1. How many meal(s) do you consume in a typical day?
☐ 1 (1) ☐ 2 (2) ☐ 3 (3) ☐ 4 (4) ☐ More than 4 (5)

2. Do you snack between meals? (Snacks are the foods and beverages we consume between meals)
☐ Yes (1) ☐ No (0)

3. In a typical day, do you consume traditional Chinese foods:
for Breakfast? ☐ Yes (1) ☐ No (0)
for Lunch? ☐ Yes (1) ☐ No (0)
for Dinner? ☐ Yes (1) ☐ No (0)

Questions 4 & 5 will ask about how true you consider each of the statement:

4. When I choose food, I choose what I like to eat even though it is not very healthy for me.
☐ Rarely or Never True (2) ☐ Sometimes True (1) ☐ Always True (0)

5. I choose foods that are healthy.
☐ Rarely or Never True (0) ☐ Sometimes True (1) ☐ Always True (2)

o. In the last month, did you try to:		Rarely or Never	Sometimes	Always
a.	Reduce the amount of added oil in cooking?	1	2	3
b.	Decrease the consumption of deep-fried foods?	1	2	3
c.	Prepare foods by boiling or steaming instead of deep-frying?	1	2	3
d.	Trim fats before cooking (e.g. avoid the skin on poultry, or visible fat on red meat)?	1	2	3
e.	Substitute low-fat alternatives for high-fat food? (E.g. substitute skim milk or low fat yogurt for creamy dessert)	1	2	3
f.	Avoid eating fried food?	1	2	3
g.	Reduce meals consumed at Chinese restaurants?	1	2	3
How many times last week did you eat the following foods?		Once or less	2-3 times	4 times or more
h.	Green leafy vegetables (e.g. bok choy, gai lan,)?	1	2	3
i.	Potato, including boiled, baked or mashed?	1	2	3
j.	Drink fresh fruit juice (e.g. orange juice, grapefruit juice)?	1	2	3
k.	Fruits, such as oranges, grapes, or banana (fresh, canned and/or frozen)?	1	2	3
l.	Other vegetables such as Chinese turnips, watercress, mustard greens, bitter melon?	1	2	3
m.	Tofu?	1	2	3
n.	Lettuce salad?	1	2	3

SECTION III: In this section, I would like to ask how you think about your quality of life. Please keep in mind your standards, hopes, pleasures and concerns. The following questions refer to your life in the last four weeks.

		Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very Satisfied
1.	How satisfied are you with your health?	1	2	3	4	5

		Not at all	A little	A moderate amount	Very much	An extreme amount
2.	To what extent do you feel that physical pain prevents you from doing what you need to do?	5	4	3	2	1

		Not at all	A little	A moderate amount	Very much	An extreme amount
3.	Do you have trouble moving and getting around?	5	4	3	2	1
4.	How much do you enjoy life?	1	2	3	4	5
5.	To what extent do you feel your life to be meaningful?	1	2	3	4	5
6.	How well are you able to concentrate?	1	2	3	4	5
7.	How safe do you feel in your daily life?	1	2	3	4	5
8.	How healthy is your physical environment?	1	2	3	4	5

The following questions also refer to your life in the last four weeks:

		Not at all	Little	Moderately	Mostly	Always
9.	Do you have enough energy for everyday life?	1	2	3	4	5
10.	Do you have the opportunity for leisure activities?	1	2	3	4	5
11.	Do you have the information you need in your day-to-day life? (This includes access to nutrition or dietary information)	1	2	3	4	5

		Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very Satisfied
12.	How satisfied are you with your sleep?	1	2	3	4	5
13.	How satisfied are you with your ability to perform your daily living activities (e.g. shop for food, cook, or feed yourself)?	1	2	3	4	5
14.	How satisfied are you with your capacity for work?	1	2	3	4	5
15.	How satisfied are you with yourself?	1	2	3	4	5
16.	How satisfied are you with your personal relationship (e.g. with friends and family)?	1	2	3	4	5
17.	How satisfied are you with the support you get from your friends and family?	1	2	3	4	5

		Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very Satisfied
18.	How satisfied are you with the conditions of your living place?	1	2	3	4	5
19.	How satisfied are you with your access to health services?	1	2	3	4	5

		Not at all	Little	Moderately	Mostly	Always
20.	Are you able to find transportation when you need to go for grocery shopping, for medical appointments or to visit friends?	1	2	3	4	5

		Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very Satisfied
21.	How satisfied are you with your appetite?	1	2	3	4	5
22.	How satisfied are you with your fitness level?	1	2	3	4	5
23.	Are you satisfied with the way your body looks?	1	2	3	4	5

The following questions refer to how often you experience certain things in the last 4weeks:

		Never	Seldom	Sometimes	Often	Always
24.	How often do you have negative feelings such as blue mood, despair, anxiety, and depression?	5	4	3	2	1

Please indicate your agreement or disagreement with the following statement:

		Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
25.	I enjoy most of the food I ate.	5	4	3	2	1
26.	I am satisfied with the taste of the food I ate.	5	4	3	2	1
27.	I have enough money to meet the needs of day-to-day life.	5	4	3	2	1
28.	I never worry about not having enough money to buy food.	5	4	3	2	1

		Very poor	Poor	Neither poor nor good	Good	Very good
29.	How would you rate your quality of life?	1	2	3	4	5

SECTION IV: Background Information

1. Please indicate your age range:

☐ 45-49 (1) ☐ 50-54 (2) ☐ 55-59 (3) ☐ *60-64* (4)

2. What is your gender?

☐ Male (1) ☐ Female (2)

3. What is your marital status?

☐ Married (1) ☐ Widowed (2) ☐ Divorced (3)
☐ Separated (4) ☐ Never married (5) ☐ Common law relationship (6)

4. In which country or place were you born?

☐ Mainland China (1) ☐ Hong Kong (2) ☐ Taiwan (3)

5. What is the highest level of education you have completed?

☐ Less than 8 years (1) ☐ 8 to 11 years (without graduation) (2)
☐ High school graduation (3) ☐ Vocational or technical school (4)
☐ Some college or university (5) ☐ Bachelor's degree or higher (6)

6. In which area do you live?

☐ Downtown Toronto (1) ☐ East York (2) ☐ Etobicoke (3) ☐ Markham (4)
☐ Scarborough (5) ☐ North York (6) ☐ Richmond Hill (7) ☐ Mississauga (8)
☐ Other (please specify): _____

7. Are you currently being diagnosed with a chronic illness? (E.g. diabetes, coronary heart disease, arthritis, respiratory disease and so forth.)

☐ Yes (1) (please specify): _____
☐ No (0)

8. Are you currently being treated for a chronic illness?

☐ Yes (1) (please specify): _____
☐ No (0)

9. Are you currently taking a medically prescribed diet or meal replacement?

☐ Yes (1) (please specify): _____
☐ No (0)

10. Does your religious belief determine what foods you eat and/or don't eat?

☐ Yes (1) (please specify): _____
☐ No (0)

11. Do you have any children in the household?

☐ Yes (1) ☐ No (0)

12. How many years have you been living in North America?

☐ 0-5 years (1) ☐ 6-10 years (2) ☐ 11-15 years (3) ☐ >15 years (4)

13. How many years in total have you been living in Western countries?

☐ 0-5 years (1) ☐ 6-10 years (2) ☐ 11-15 years (3) ☐ >15 years (4)

14. How do you rate your English level?

☐ Poor (1) ☐ Fair (2) ☐ Good (3) ☐ Excellent (4)

15. What is your primary source(s) of nutrition information?

☐ Friends/Family (1)
☐ Registered Dietitian (2)
☐ Chinese media (e.g. Chinese television channels, radio, newspapers, magazines) (3)
☐ English media (e.g. English television channels, radio, newspapers, magazines) (4)
☐ Other (Please specify): _____

16. What was your diet like during the past year compared to your diet before coming to Canada?

☐ About the same (1) ☐ A little different (2) ☐ Very different (3)

17. How often does your physical activity add up to at least 60 minutes a day? (This would include activities such as walking the stairs, walking to the car, vacuuming, etc.- as well as any other recreational activities.)

☐ Daily (4)
☐ 2-3 times per week (2)
☐ 4-6 times per week (3)
☐ 1 or less time per week (1)

18. What is your weight and height?

(i) My *Weight* is: _____lbs OR _____ kg

(ii) My *Height* is: _____ft_____in OR _____ m_____cm

Would you like to take a few more minutes and give me your thoughts on a couple more questions about your perceptions on Chinese and Western foods?

SECTION V: OPEN-ENDED QUESIONS

1. The concept of "food as medicine" has been used in Traditional Chinese Medicine (TCM) over thousands of years. According to TCM, food has its medicinal properties. A careful selection of food in ones' diet can help maintain and restore health.

   (i) Do you agree or disagree with this statement? Why or why not?
   (ii) Can you give me any example(s) of using Chinese foods in the prevention and treatment of a disease(s)?

2. (i) What are your perceptions and attitudes on Western foods? What are the things you may immediately think of in regards to both Western and Chinese eating habits?
   (ii) Do you include Western foods as a part of your usual diet?
   (iii) If so, can you tell me how you adapt and integrate these Western foods in your daily meals?

APPENDIX I

QUESTIONNAIRE (CHINESE VERSION)

第一部份：以下的問題將會問及您的健康信念。請按照您的第一個反應，選擇您認為最適當的答案。這份問卷並不是一個測試，答案是沒有對或錯的。在我說出每一句觀點的同時，您有五個選擇「非常同意」、「同意」、「中立」、「不同意」或「非常不同意」。

		非常同意	同意	中立	不同意	非常不同意
1.	我比較喜歡吃西方食物多於喜歡吃中式食物。	1	2	3	4	5
2.	一般來說，我認為中式食物較西方食物健康。	5	4	3	2	1
3.	我不會注重平衡進食寒涼和燥熱 (陰或陽性質) 的食品。	1	2	3	4	5
4.	老年人體質虛寒，容易患上虛寒的病症。	5	4	3	2	1
5.	配合進食寒涼或溫熱性質的食物對健康很重要。	5	4	3	2	1
6.	溫熱性質(陽性)食物有助增加活力。	5	4	3	2	1
7.	寒涼性質(陰性)食物有清熱、瀉火作用。	5	4	3	2	1
8.	進食煎炸和油膩的食物可能會導致癌症及心臟病。	5	4	3	2	1
9.	健康飲食是指定時定量的三餐，每餐之間不吃零食。	5	4	3	2	1
10.	健康飲食同時亦包括不過饑或過飽。	5	4	3	2	1
11.	準備中式飯菜既費時又麻煩。	1	2	3	4	5

12.	在生病期間(或病癒後)，選用適當的食物有助於康復。	5	4	3	2	1
13.	順應四季氣候變化調節飲食是保持健康的重要因素。	5	4	3	2	1
14.	食用某些食物會導致身體出現「濕熱」、「煩燥」或「中毒」等反應。	5	4	3	2	1
15.	調節進食陰陽性質的食物而適合個人體質是非常重要的。	5	4	3	2	1
		非常同意	同意	中立	不同意	非常不同意
16.	適當地進食適合自已體質的補品可以預防疾病。	5	4	3	2	1
17.	有些食物與中草藥可以中和處方藥物帶來的副作用。	5	4	3	2	1
18.	食物可以影響一個人的性情。	5	4	3	2	1
19.	在我的社區裏，我容易購買中式食物及找到東方食物市場。	5	4	3	2	1
20.	一般來說，在加拿大的中式食品價格比在中國國內的昂貴。	5	4	3	2	1

Coding: 9= refuse to answer

第二部份：以下的問題是有關您的飲食習慣的。請選擇最適當的答案。這些問題的答案是沒有對或錯的。

1. 在平日的一天中，您進食多少次正餐？

   □ 1次 (1) □ 2次 (2) □ 3次 (3) □ 4次(4) □ 多於4次 (5)

2. 在每餐之間，您有吃小食的習慣嗎？（小食是指在正餐以外進食的食物或飲料）

   □ 有 (1) □ 沒有 (0)

3. 在平常的一天中，您會享用傳統中國食物嗎？

(i) 早餐 □ 會 (1)(□ 不會 (0)

(ii) 午餐 □ 會 (1) □ 不會 (0)

(iii) 晚餐 □ 會 (1) □ 不會 (0)

下列兩個問題是有關您對以下觀點的看法

4. 我在選擇食物時，我不計較食物的營養價值，只會選擇自己喜歡吃的食物。

□ 很少真確或從不真確 (2) □ 有時真確 (1)□ 時常真確 (0)

5. 我選擇進食有益健康的食物。

□ 很少真確或從不真確 (0) □ 有時真確 (1)□ 時常真確 (2)

6. 在過去的一個月內，您有否嘗試		很少或從不	有時	時常
a.	在煮食時減少用油？	1	2	3
b.	減少進食油炸食品？	1	2	3
c.	用水煮或清蒸等烹調方法來取代油炸烹調方法？	1	2	3
d.	在煮食前，先除去脂肪 (例如去掉家禽的皮層、或去掉紅肉上可見的油脂？)	1	2	3
e.	選擇較低脂肪的食品來取代高脂食物？(例如食用脫脂牛奶或低脂酸奶(乳酪)來取代奶油類的甜品)	1	2	3
f.	減少進食煎炸食物？	1	2	3
g.	減少在酒樓用膳？	1	2	3

上星期內，您食用過多少次以下的食物		一次或以下	兩至三次	四次或以上
h.	綠色有葉蔬菜，例如白菜、或芥蘭等	1	2	3
i.	土豆/馬鈴薯 (包括煮的、烤的、搗碎的(薯蓉))？	1	2	3
j.	新鮮果汁 (包括橙汁、西柚汁等)	1	2	3

k.	水果，例如橙、葡萄、或香蕉等(包括新鮮、罐裝或急凍)？	1	2	3
l.	其他蔬菜,例如白蘿蔔、西洋菜、芥菜或苦瓜?	1	2	3
m.	豆腐？	1	2	3
n.	生菜沙律？	1	2	3

第三部份: 在這個部份,我想問及您對生活素質的看法。請保持您自己的標準、願望、感受或關注來回答。所有問題都是指您最近4周內的情況。

		非常不滿意	不滿意	一般	滿意	非常滿意
1.	您對自己的健康狀況滿意嗎?	1	2	3	4	5

		根本沒有	有點	中等	很大	極大
2.	在多大程度上,您感覺軀體疼痛，妨礙您去做需要做的事情?	5	4	3	2	1
3.	您的活動能力有困難嗎？	5	4	3	2	1

		根本沒有	有點	中等	大多數	經常
4.	您享受您的生活嗎？	1	2	3	4	5
5.	您覺得您的生活有意義嗎?	1	2	3	4	5
6.	您能集中注意力嗎?	1	2	3	4	5
7.	在日常生活中，您感到安全嗎?	1	2	3	4	5
8.	您的生活環境對您的健康好嗎?	1	2	3	4	5

下列問題也是指您最近4周內的情況

		根本沒有(能力)	有點	中等	多數有(能力)	完全有(能力)
9.	您有充沛的精力去應付日常生活嗎?	1	2	3	4	5
10.	您有沒有機會進行休閑活動呢?	1	2	3	4	5
11.	在日常生活中,不斷需要新的訊息(包括營養,飲食資訊)。這些資訊您能夠得到嗎?	1	2	3	4	5

		非常不滿意	不滿意	一般	滿意	非常滿意
12.	您對自己的睡眠情況滿意嗎?	1	2	3	4	5
13.	您對自己處理日常生活事情的能力滿意嗎 (例如：購買食物,烹調食物,或進食能力)?	1	2	3	4	5
14.	您滿意自己的工作能力嗎?	1	2	3	4	5
15.	您對自己滿意嗎?	1	2	3	4	5
16.	您滿意自己對家人、朋友之間的人際關係嗎？	1	2	3	4	5
17.	您滿意家人及朋友對您的支持嗎？	1	2	3	4	5
18.	您滿意您的居住條件嗎?	1	2	3	4	5
19.	您對您能享受到的醫療衛生保健服務滿意嗎?	1	2	3	4	5
20.	當您需要外出購物、看醫生或探望朋友時,您能夠找到所需的交通工具嗎?	1	2	3	4	5

		非常不滿意	不滿意	一般	滿意	非常滿意
21.	您滿意您的胃口嗎?	1	2	3	4	5
22.	您滿意您的體力水平嗎？	1	2	3	4	5
23.	您滿意您的體型及外觀嗎?	1	2	3	4	5

下列問題是有關您在過去4周中經歷某些事情的頻繁程度。

		從不	很少	有時	經常	總是
24.	您有消極感受的次數是多少？例如：情緒低落,絕望,焦慮或抑鬱等。	5	4	3	2	1

請說明您對以下觀點的看法。您有五個選擇「非常同意」、「同意」、「一般」、「不同意」或「非常不同意」。

		非常同意	同意	一般	不同意	非常不同意
25.	我喜歡大部份我吃過的食物。	5	4	3	2	1
26.	我滿意我進食過的食物的味道。	5	4	3	2	1
27.	我有足夠的金錢來維持日常生活需要。	5	4	3	2	1
28.	我從不憂慮沒有足夠的金錢購買食物。	5	4	3	2	1

		很差	差	一般	好	很好
29.	您如何評價你的生活水平?	1	2	3	4	5

第四部份：背景資料

1. 請說出您的年齡界別：

□ 45-49歲 (1) □ 50-54歲 (2) □ 55-59歲 (3) □ 60-64歲 (4)

2. 您的性別是甚麼？

□ 男 (1) □ 女 (2)

3. 您的婚姻狀況如何？

□ 已婚 (1) □ 喪偶 (2) □ 離婚 (3)
□ 分居 (4) □ 未婚 (5) □ 同居 (6)

4. 您的出生地點在那裏？

□ 中國大陸 (1) □ 香港 (2) □ 台灣 (3)

5. 您所受的最高教育是甚麼？

□ 小於8年 (1) □ 8至11年 (沒有畢業) (2)
□ 高中畢業 (3) □ 職業或技術學校 (4)
□ 部份大專或大學 (5) □ 學士學位或更高 (6)

6. 您居住在那一個地區？

□ 多倫多市中心 (1) □ 東約克 (2) □ 依陶碧谷市 (3) □ 萬錦市 (4)
□ 士嘉堡 (5) □ 北約克 (6) □ 烈治文山 (7) □ 密西沙加市 (8)
□ 其他 (請說明:_____)

7. 您是否被診斷患有慢性疾病？(如糖尿病、冠心病、關節炎、呼吸系統疾病等。)

□ 是 (1) (請說明:_____)
□ 否 (0)

8. 您是否曾經接受過慢性疾病治療？

□ 是 (1) (請說明:_____)

□ 否 (0)

9. 您是否食用處方飲食或指定的營養飲品以代替正餐（meal replacement）？

□ 是 (1) (請說明:_____)

□ 否 (0)

10. 您的宗教信仰有否改變你進食(或不進食)某些食物？

□ 有 (1) (請說明:_____)

□ 否 (0)

11. 您的家庭中有沒有小孩？

□ 有 (1) □ 沒有 (0)

12. 您在北美洲的居住年數？

□ 0至5年 (1) □ 6至10年 (2) □ 11至15年 (3) □ 15年以上 (4)

13. 您在西方國家的總居住年數？

□ 0至5年 (1) □ 6至10年 (2) □ 11至15年 (3) □ 15年以上 (4)

14. 您怎樣評估您的英語水平？

□ 較差 (1) □ 一般 (2) □ 良好 (3) □ 非常好 (4)

15. 您主要從那途徑獲得營養資訊？

□ 朋友或家人 (1)

□ 註冊營養師 (2)

□ 中文傳媒（例如：中文電視台、收音廣播電台、報章、雜誌等。）(3)

□ 英文傳媒（例如：英文電視台、收音廣播電台、報章、雜誌等。）(4)

□ 其他 (請說明:_____)

16. 在過去的一年裏，您的飲食習慣與移居加拿大之前互相比較有甚麼不同？

□ 沒有大分別 (1) □ 有少許不同 (2) □ 差異較大 (3)

17. 您做了多少次達到每天最少60分鐘的體育活動？

(這包括上下樓梯，步行到車位，吸塵等活動、以及一切娛樂與休閒活動。)

□ 每天 (4) □ 每星期四至六次 (3)

□ 每星期兩至三次 (2) □ 每星期一次或更少 (1)

18. 您的體重與身高是甚麼？

(i) 我的體重是：_____ 磅 或 _____公斤

(ii) 我的身高是：_____呎 ____吋 或 _____米_____厘米

您願意多抽數分鐘時間，告訴我有關您對中式及西方食品的看法嗎？

第五部份：以下問題並無固定答案

1. 食療保健概念被應用在中國傳統醫學已有數千年歷史。在中醫角度來說,每種食物都是藥物,只要我們吃下適合體質的食物,對身體便有補益。

(i) 您對這話句說話有何看法？

(ii) 您可以列舉一些例子說明您如何運用中國食物來保健身體和治療疾病嗎？

2. (i) 您對西方食物的認知及態度是怎樣？(例如: 您認同西方的飲食的模式嗎？為甚麼？)

(ii) 您有否在平日飲食中加入西方食物呢？

(iii) 如果有的話，您可否告訴我您如何把它們調節及融入您每日的飲食中？