Using Videos to Communicate the Risks and Benefits of Consuming Fish to Chinese-Canadian Women

by

Kwan Yu Li

A Thesis
presented to
The University of Guelph

In partial fulfilment of requirements
for the degree of
Master of Science
in
Family Relations and Applied Nutrition

Guelph, Ontario, Canada

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ABSTRACT

USING VIDEOS TO COMMUNICATE THE RISKS AND BENEFITS OF CONSUMING FISH TO CHINESE-CANADIAN WOMEN

Kwan Yu Li
University of Guelph, 2011

Advisor: Dr. Judy Sheeshka

The objective of this study was to use a Community Based Participatory Approach and the results of a needs assessment conducted in previous research to develop videos on the topic of consuming fish during pregnancy. Phase one entailed conducting two small discussion groups with Chinese-Canadian women (n=28) to verify that the data collected in the needs assessment was still valid and to obtain more specific information about the preferred style of the videos. In phase two, researchers developed two scripts and filmed the videos. In phase three, researchers showed the videos to a sample of Chinese-Canadian women (n=20) in Peer Nutrition Program groups to gather preliminary feedback and to obtain a general sense of what the Chinese-Canadian women found most valuable in the videos. In general, the videos were well-received and the practical video made a greater impression on the women than the scientific information.
ACKNOWLEDGEMENTS

It is a pleasure to thank those who have made this thesis possible. I would like to thank my advisor Dr. Judy Sheeshka, who has shown constant support and guidance through my entire thesis project, and without her none of this would have been possible.

I would also like to extend a sincere thank you to the members of my advisory committee, Dr. Loren Vanderlinden and Dr. Barbara Knuth. Their valuable feedback and guidance throughout my thesis project have been imperative to my success.

This thesis could not have been possible without the help of the staff at the Toronto Public Health Peer Nutrition Programs and University of Guelph research assistants: Ying Wang, Esther Youyou Huang and George Cao. Their willingness to help has been essential, and I could not thank them enough. I would also like to thank Teaching Support Services at the University of Guelph for providing me with much needed guidance and technical support. Additionally, success of the videos can be attributed to: Esther Youyou Huang, Roy Feng and Jianhua Ma.

I owe my deepest gratitude to my family, especially my parents, who have provided me with so much love and support during my undergraduate and graduate career at the University of Guelph. Their faith and belief in my abilities has encouraged me to aim high and strive to be the best I can be. Without them, I would not be who I am today.

Lastly, but (most certainly) not least, I would like to thank my friends and fellow graduate students: Laura Chouinard, Mary Anne Dick, Laura French, Jillian Gumbley, Emily Opperman, Caitlin Way and Kylie Whyte. They provided me with much laughter and encouragement throughout my two years at Guelph and have been essential to my happiness in the program and success as a graduate student. I have been fortunate enough to meet this wonderful group of friends, and will continue to cherish our friendships.
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INTRODUCTION

I. **Nutritional Aspect of Fish Consumption**

In 2008, an average Canadian consumed approximately 6.6 kg of fish a year including fresh, frozen, processed and shellfish (Statistics Canada, 2009). In the following year, fish consumption increased by 1.5% (Statistics Canada, 2010). Consumers have always valued fish as a “protein food”. Fish proteins have a high biological value and are easily digestible (Costa, 2007). In comparison to other sources of protein, the quality of fish protein is greater than that of beef and milk with a protein efficiency ratio (PER) of 2.30 and 2.50, respectively. When comparing the protein quality of fish to that of an egg, fish comes close with a PER of 3.55 whereas an egg has a PER of 3.92 (Sheeshka & Murkin, 2002).

In addition to protein quality, fish generally contain more heart healthy fats compared to other sources of protein. Many of the health benefits demonstrated by fish are said to stem from the essential fatty acids in the omega-3 class. Since our bodies are unable to produce the long-chain omega-3 fatty acids, they are known as essential fatty acids and must be provided through the diet (Insel, Ross, McMahon, & Bernstein, 2011). The omega-3 fatty acids docosahexanoic acid (DHA) and eicosapentanoic acid (EPA) are most abundant in fish. Consuming sufficient amounts of EPA and DHA are critical for brain development and function, proper eyesight, and are protective against certain chronic diseases (Ruxton, Reed, Simpson, & Millington, 2004).

Fish contains lower amounts of cholesterol compared to beef, pork and chicken. In relation to vitamins and minerals, fish is an excellent source of niacin, selenium and vitamin B12. It can also contribute substantial amounts of vitamins A and D, calcium,
zinc and heme iron, micronutrients which are especially important for pregnant women (Sheeshka & Murkin, 2002).

With more consumers acknowledging fish as being a good source of protein with many beneficial properties, it is important to educate the public regarding certain risks that may be associated with fish consumption. Moreover, culturally-appropriate education should focus on women who are pregnant, may become pregnant or are breastfeeding, as they are responsible for their own health and the health of their child or children. The objective of this study was to use a Community Based Participatory Approach and the results of a needs assessment conducted in previous research to develop videos on the topic of consuming fish during pregnancy.
CHAPTER 1: LITERATURE REVIEW

1.0 Benefits of Fish Consumption

1.0.1 General Health Benefits of Fish Consumption

Many health benefits of fish are said to come from the availability of omega-3 fatty acids. A benefit of fish consumption for the general population is a reduced risk of coronary heart disease (CHD). A review by Daviglus, Sheeshka, and Murkin (2002) found that five of eight prospective population studies, two case-control studies and one intervention trial demonstrated a significant inverse relationship between fish consumption and risk of CHD mortality. This association was seen in men with no previous history or symptoms of CHD and existed in individuals who consumed as little as one to two meals of lean or fatty fish a week (Daviglus et al., 2002). Hu et al. (2002) found a similar inverse association between fish consumption and CHD mortality amongst women. The inverse association was seen in individuals who consumed fish one to three times per month (21% decreased risk of CHD death), once per week (29%), two to four times per week (31%) and greater than five times a week (34%) (Hu et al., 2002).

A Cochrane review analyzed 48 randomized controlled trials and 41 cohort studies (n= 36 913) conducted until 2004, to assess whether dietary or supplemental omega-3 fatty acids had an effect on cardiovascular disease or mortality (Hooper et al., 2004). The researchers found that neither dietary nor supplemental omega-3 fatty acids had a significant effect on mortality or cardiovascular events in people with, or at high risk of, cardiovascular disease (Hooper et al., 2004).
There seems to be a discrepancy in findings regarding the effects of omega-3 fatty acids and cardiovascular health. Daviglus et al. (2002) reported that the inverse relationship seen in their review is most likely not due to the omega-3 fatty acid content in fish, since lean and fatty fish appeared to have the same protective effects against cardiac death. Cochrane reviewers also recognized that more research needs to be conducted concerning the protective effects that omega-3 fatty acids have on cardiovascular health (Hooper et al., 2004).

Other health benefits of fish may include a decreased risk of smoking-related chronic obstructive pulmonary disease, protection of the lungs from long-term cigarette smoke, decreased risk of rheumatoid arthritis in women, decreased risk of age-related macular degeneration and reduced risk of asthma. Unlike CHD, these benefits have not been widely studied and more research is needed (Costa, 2007; Daviglus et al., 2002).

1.0.2 Maternal Benefits of Omega-3 Fatty Acids

1.0.2.1 Preeclampsia

Preeclampsia only occurs during pregnancy and can affect 3 to 5% of all pregnancies. It is usually characterized by a simultaneous increase in blood pressure and proteinuria and is the leading cause of maternal and perinatal mortality (Roberts & Cooper, 2001). There is research to support an association between increased omega-3 fatty acid consumption and a decreased risk for preeclampsia (Mozurkewich, Berman, & Chilimigras, 2010; Jensen, 2006). A case-control study conducted by Williams, Zingheim, King and Zebelman (1995) demonstrated that women who consumed the
lowest levels of omega-3 fatty acids in their study were 7.6 times more likely to develop preeclampsia. Due to the nature of the design however, researchers were unsure whether the observed results are due to the omega-3 fatty acid intervention or occurred prior to the development of preeclampsia (Williams et al., 1995).

Mozurkewich et al. (2010) found that some observational studies using diet histories did not show an association between omega-3 fatty acids and preeclampsia. One study found that low (≤ 0.09 g/day) and high intake (>0.87 g/day) of cod liver oil during pregnancy actually increased the risk for gestational hypertension. The cod liver oil used in the study however, also contained substantial amounts of vitamins A, D and E. Researchers noted potential confounding variables between the omega-3 fatty acids and vitamins (Olafsdottir et al., 2006). Mahomed, Williams, King, Mudzamiri and Woelk (2007) conducted a case-control study and found no clear evidence of a linear relationship between increasing levels of omega-3 fatty acids and reduced risk of preeclampsia. Researchers utilized a small sample (n= 170) from a developing country therefore results may not be generalizable to developed countries, such as Canada. Oken et al. (2007) conducted a study analyzing dietary maternal intake of omega-3 fatty acids and fish. They found that women who had preeclampsia had a somewhat lower consumption of DHA and EPA omega-3 fatty acids and women who had a higher intake of DHA and EPA omega-3 fatty acids had a somewhat-lower risk of preeclampsia. The researchers, however, did acknowledge that they did not have sufficient statistical power in order to detect true associations due to the small amount of women (3%) who had developed preeclampsia. They also used a food frequency questionnaire to assess
maternal food intake which has limitations in accurately assessing dietary intake (Oken et al., 2007).

1.0.2.2 Postpartum Depression

Postpartum depression affects 3-20% of new mothers and can appear anytime between the birth of a child to 6 months after birth, lasting between several months to a year (Canadian Mental Health Association, 2010). There have been hypotheses regarding an association between increased omega-3 fatty acids and a decreased risk of postpartum depression. Research has found that women who are developing symptoms of depression tend to have less availability of DHA in plasma phospholipids, as measured by the increase of the DHA to n-6 DPA (docosapentanoic acid) ratio, during the postpartum period (Otto, de Groot, & Hornstra, 2003). A review conducted on omega-3 fatty acids or DHA and postpartum depression found that epidemiological and preclinical data supported the association between decreased levels of omega-3 fatty acids and postpartum depression (Freeman, 2006). Su, Huang, Chiu and Shen (2008) conducted a double-blind, placebo-controlled, trial of omega-3 fatty acids in pregnant women with postpartum depression. Researchers found that there were significant improvements in depressive symptoms for women who consumed 3.4 g/d of omega-3 fatty acids, as measured by the Hamilton Rating Scale for Depression tool (p= 0.001). Golding, Steer, Emmett, Davis and Hibbeln (2009) found a similar association however; they obtained data regarding omega-3 fatty acid levels from actual seafood consumption through a food frequency questionnaire versus supplementation. Compared to those who consumed 1.5 g
of omega-3 fatty acids through seafood consumption, the women who consumed none were 50% more likely to have high levels of depressive symptoms (Golding et al., 2009).

Miyake et al. (2006) conducted a study with 865 Japanese women with a naturally high consumption of seafood and there was no clear inverse relationship between fish, omega-3 fatty acids, omega-6 fatty acids, EPA, DHA or the ratio between omega-3 and omega-6 fatty acid intake and postpartum depression. However, a J-shaped relationship existed between omega-3 fatty acids and DHA, suggesting that perhaps an association between total omega-3 fatty acids, DHA and postpartum depression is dose-dependent (Miyake et al., 2006). A prospective cohort study followed 54,202 women from the Netherlands. Researchers were unable to identify an association between fish or omega-3 fatty acid intake with postpartum depression (Strom, Mortensen, Halldorsson, Thorsdottir, & Olsen, 2009). The inclusion criteria for this study however were non-specific. Women were included in the study if they were diagnosed with a “depressive episode”; an episode was not operationally defined. (Strom et al., 2009).

1.0.2.3 Preterm Births

Preterm birth is described as delivery at less than 37 weeks of gestation. Preterm delivery is usually associated with many complications for the infant such as respiratory distress syndrome, apnea, necrotizing enterocolitis and much more (March of Dimes, 2010). Studies conducted in Iceland, the United Kingdom and the United States did not find an association with fish consumption and gestational length or prematurity (Mozurkewich et al., 2010).
However, a prospective cohort of 8,729 Danish women was conducted to identify an association between seafood intake and risks of preterm delivery (Olsen et al., 2006). Researchers found that women who had never consumed fish during pregnancy were at risk of delivering preterm (Olsen et al., 2006). Olsen and Secher (2002) also conducted a study to determine if low seafood consumption was associated with a risk of preterm birth in a cohort of Danish women (n= 8,729). They identified that mothers who consumed less than 0.15 g (150 mg) of omega-3 fatty acid supplements or 15 g of fish per day demonstrated a stronger association for preterm delivery (Olsen & Secher, 2002).

Although an out-dated study, Reece, McGregor, Allen and Harris (1997) used blood samples to identify the omega-3 fatty acid levels of 37 mothers. Researchers found that the ratio of omega-3 fatty acids to omega-6 fatty acids had a tendency to be lower in those who gave birth to pre-term infants, identifying an association between decreased levels of omega-3 fatty acids and the risk of pre-term birth (Reece et al., 1997). A review conducted on the use of omega-3 fatty acid supplements and the risk of preterm birth found that 4 of the 7 trials reviewed saw an association between the two measurement outcomes (Olsen, 2004). Researchers acknowledge that further studies are warranted to determine the extent of which omega-3 fatty acid supplements can reduce the recurrence of preterm birth, since current evidence is lacking. A Cochrane review conducted on marine oil supplementation during pregnancy found that of the participants who consumed marine oil supplements (n= 1,621), a significant increase in length of gestation by 2.6 days for singleton births was demonstrated (Makrides, Duley, & Olsen, 2006). There seems to be sufficient evidence in the literature to suggest an association between
increased omega-3 fatty acid intake through supplements or seafood consumption and decreased risk of preterm births.

### 1.0.3 Benefits of DHA for Infants

#### 1.0.3.1 Maternal Influence on Infant Omega-3 Fatty Acid Levels

There is a rapid uptake of DHA and AA (arachidonic acid) in the fetal brain during the last trimester of pregnancy. The level of omega-3 fatty acid stores in the fetus at this time is dependent on maternal intake. Connor, Lowensohn and Hatcher (1996) demonstrated that infants whose mothers were supplemented with sardine and fish oil supplements (2.6 g/d with 1.01 g of DHA) had a 35.2% increase of DHA in red blood cells and 45.5% increase of DHA in plasma as compared to newborns whose mothers were not supplemented. Similarly, after birth the mother continues to play a large nutritional role in the life of a newborn. Breast milk is a natural source of DHA (Ruxton et al., 2004) and the amount of DHA in breast milk can increase with increasing maternal fish or supplement intake (Innis, 2004).

#### 1.0.3.2 Visual Acuity and Cognitive Development

Perhaps the greatest benefits of DHA intake for an infant are enhanced visual acuity and cognitive development. Studies have shown that maternal intake of DHA is associated with both enhanced infant neural and visual development (Innis & Friesen, 2008). A Canadian study was conducted with healthy, term infants (n= 83) to determine an association between DHA blood levels and visual and neural development. Innis,
Gilley and Werker (2001) collected infant blood samples 60 days after birth and found lower levels of DHA in the blood were associated with significantly lower visual acuity at both 60 days and 1 year of age, compared to infants with higher levels of DHA; all infants in the study were exclusively breast fed.

In 2008, a Cochrane review including both term and pre-term infant was conducted (Simmer et al., 2008). Researchers identified that there were no significant benefits for full-term infants consuming omega-3 fatty acids in regards to visual acuity and development. For pre-term infants however, Simmer et al. (2008) found that there was a benefit to DHA supplementation in the first 4 months.

Interestingly, Helland, Smith, Saarem, Saugstad and Drevon (2003) found that mothers who were supplemented with cod liver oil during pregnancy gave birth to children who scored higher on mental processing scores on the Kaufman Assessment Battery for Children intelligence test at 4 years of age. The findings in this study need to be confirmed with additional research, since many factors can also be involved in measuring the intelligence of a child such as genetics, environment and parental education among others. Jensen et al. (2005) found that infants of mothers who were being supplemented with DHA capsules while breastfeeding had significantly (p < 0.01) higher test scores as shown by the Bayley Psychomotor Development Index at 30 months of age. Jensen et al. (2010) conducted a follow-up study on the same children at 5 years of age and found that children of mothers who received DHA supplementation during breastfeeding performed better on the test of sustained attention. The results of both the original and follow-up study suggest to researchers that DHA intake during early stages of development can have long-term benefits on certain aspects of neural development.
Although the studies conducted by Helland et al. (2003) and Jensen et al. (2005) use two different assessment tools, results seem to be parallel in that DHA supplementation is associated with components of better neural development.

Many of the aforementioned studies used DHA in the form of supplements. Jacobson et al. (2008) conducted a study within an Inuit community in Arctic Quebec where the culture places importance on fishing and eating large quantities of marine mammals and fish, which are rich sources of DHA. The objective of the research was to examine a relation between cord plasma DHA concentration and infant visual acuity, cognitive and motor development and effects of growth and development associated with DHA intake while breastfeeding. They found that a higher cord DHA concentration, reflective of prenatal levels (received by the fetus), was associated with better visual acuity, memory and attention scores at 6 months of age and mental and psychomotor performance at 11 months (Jacobson et al., 2008). A relationship was not found, however, between DHA from breast milk and cognitive or motor development (Jacobson et al., 2008). This research is important since the Inuit and Chinese culture both have a tendency to have an increased consumption of sport-caught fish.

1.0.3.3 Other Benefits

There have been few studies examining other benefits of DHA consumption in the early stages of life. Cheruku, Montgomery-Downs, Farkas, Thoman and Lammi-Keefe (2002) conducted a study to identify whether central nervous system integrity, as measured by sleeping patterns, was associated with maternal DHA concentrations. To measure sleeping patterns, researchers placed a pressure-sensitive pad under the infant’s
bed to record body movements and respiratory patterns. They found that infants of mothers with higher DHA levels had better sleeping patterns than infants born to mothers of lower DHA levels (Cheruku et al., 2002). Only one study has been conducted on this association and with a relatively small sample size (n= 17) therefore, more research is needed to confirm or refute the association. Studies have also been conducted exploring the relationship between increased omega-3 levels and asthma and allergy. The results of all studies demonstrate that there is limited support for this relationship (Institute of Medicine, 2007).

1.1 **Common Contaminants Associated with Fish Consumption**

Although there are numerous health benefits associated with fish consumption, consumers are becoming increasingly aware of the contaminants associated with fish as well. These contaminants can be both naturally-occurring and industrial activities. Contaminants include heavy metals such as methylmercury (MeHg), and persistent organic pollutants such as dioxins and polychlorinated biphenyls (United States Environmental Protection Agency, 2009). Methylmercury is a contaminant of concern as it is a potent neurotoxin and also can accumulate in our ecosystem.

1.1.1 **What is Mercury**

Mercury is a naturally occurring element that can be found in air, water and soil. It can be categorized into 3 groups: metallic, inorganic and organic mercury. As previously mentioned, consumers are generally interested in organic mercury such as methylmercury (United States Environmental Protection Agency, 2009). Activities such
as burning coal and using mercury to manufacture certain products increase the amount of mercury present in our environment; mercury can also come from natural sources such as volcanic eruptions and forest fires (Dovydaitis, 2008). This mercury from the environment settles in our aquatic ecosystems where small microbial actions convert it into MeHg. It is this form of MeHg than can be harmful (Dovydaitis, 2008).

1.1.2 Bioaccumulation Process

When MeHg is leached into our aquatic ecosystems it can bioaccumulate in our fish and shellfish, which are the leading source of methylmercury for humans, and can cause potential negative effects (United States Environmental Protection Agency, 2009).

The bioaccumulation process begins in the water when small organisms and plants (i.e. plankton) absorb methylmercury through passive surface absorption or through their food intake. The amounts of mercury in these species are not harmful to the organism, however MeHg biomagnifies through the food chain as predators consume other organisms and absorb the contaminants that their food sources contained. Since humans are at the top of this food chain, we tend to consume fish with levels of MeHg much greater than what was originally present in the water (Environment Canada, 2010).

1.1.3 Risks of Methylmercury Consumption

Ekino, Susa, Ninomiya, Imamura and Kitamura (2007) reviewed symptoms of MeHg toxicity in mothers and children that were exposed to high levels of MeHg during the early 1950s in Minamata, Japan. Adults with acute MeHg poisoning demonstrated blurred vision, hearing impairment, changes in sense of smell and loss of taste, difficulty
performing complex movement (i.e. rapid movements, finger-to-nose and heel-to-knee tests etc.), clumsiness of the hands, motor speech disorders (i.e. difficulty articulating words), somatosensory (numbness, tingling of extremities and around lips) and psychiatric disorders.

Children of mothers who were exposed to MeHg during gestation demonstrated serious disturbances in mental and motor development as well as significant difficulties in chewing, swallowing, speech, gait and other coordination and involuntary movement (Ekino et al., 2007).

Three epidemiological studies have been conducted assessing the effect of prenatal methylmercury exposure and child development. Unlike the studies of Minimata disease, which are related to acute, high level exposure to MeHg, the following 3 studies have examined the effects from chronic, lower level MeHg exposure among regular fish consuming populations.

The Faroe Island and New Zealand studies provide evidence that prenatal MeHg exposure is associated with adverse neurological effects, whereas the Seychelles Child Development study does not (Institute of Medicine, 2007).

The Seychelles Child Development study is a longitudinal project designed to study the effect of prenatal MeHg exposure from fish consumption on child development. To date, the only adverse effect noted has been a decrease in motor speed performance in the non-dominant hand of 9 year-old children (Davidson, Myers, Weiss, Shamlaye, & Cox, 2006). No consistent evidence has been established for adverse effects of prenatal MeHg through fish consumption and child development; however research with this cohort is on-going (Davidson et al., 2006).
Steuerwald et al. (2000) analyzed maternal serum, hair, and milk and umbilical cord blood of 182 infants and found that prenatal exposure to MeHg from seafood intake was associated with neurodevelopmental delays. The cohort used in this study, however, was from the Faroe Islands where there is a high consumption of pilot whale, which is rarely seen in other cultures and could potentially affect data and limit generalizability. A similar study conducted on a cohort of 7 year-old children from the Faroe Islands also found pronounced neuropsychological dysfunctions such as language, attention, memory, visuospatial and motor functions (Grandjean et al., 1997). Similarly, a New Zealand study obtained hair mercury samples and a diet questionnaire from 10,970 mothers. A number of psychological and scholastic tests were conducted on children of these women and in addition, mothers were also interviewed for social and environmental factors (Crump, Kjellström, Shipp, Silvers, & Stewart, 1998). Researchers found evidence demonstrating that prenatal methylmercury exposure can have an adverse effect on psychological and scholastic tests conducted.

1.2 Advice on Fish Consumption

The concentration of methylmercury is dependent on three factors: MeHg level in the water, predatory nature of the species and the lifespan of the species. Due to the bioaccumulation process and risks associated with MeHg consumption, large predatory fish are of concern and Health Canada has identified these to be: fresh and frozen tuna, shark, swordfish, marlin, orange roughy and escolar (snake mackerel) (Health Canada, 2008).
Health Canada (2008) has also outlined specific consumption advice according to an individual’s level of risk (Table 1). Specified women (those who are or may become pregnant or are breastfeeding) and children between the ages of 1 to 11 have lower recommendations than the general population since there are some risks associated with consumption of fish due to contaminants. Specified women are able to pass contaminants to their fetus, through maternal consumption during pregnancy or their infant from breastfeeding. This could potentially jeopardize their health and the health of children between the ages of 1 to 11 years old, who are still developing and growing.

Table 1

*Health Canada Consumption Advice for Predatory Fish*

<table>
<thead>
<tr>
<th>General Population</th>
<th>Specified Women&lt;sup&gt;1&lt;/sup&gt;</th>
<th>Children 5-11 years old</th>
<th>Children 1-4 years old</th>
</tr>
</thead>
<tbody>
<tr>
<td>150 g per week&lt;sup&gt;2&lt;/sup&gt;</td>
<td>150 g per month</td>
<td>125 g per month</td>
<td>75 g per month</td>
</tr>
</tbody>
</table>

<sup>1</sup> Specified women are those who are or may become pregnant or are breastfeeding.

<sup>2</sup> 150 g = 2 Canada Food Guide servings = approximately 1 cup (250 mL)

Eating Well with Canada’s Food Guide also encourages Canadians to eat at least two servings of fish each week (Health Canada, 2007). For specified women and children between the ages of 1-11 years old, this may exceed the Health Canada recommendations of consuming 150 g (2 servings) a month, resulting in excess consumption of contaminants. Therefore, these populations need to be made more aware of the Health Canada recommendations of fish consumption.

1.3 **Chinese-Canadian Consumption Patterns**

The Chinese-Canadian population is of interest to researchers since their culture includes a high consumption of fish. Silver et al. (2007) found that their Asian
participants had the highest intake of fish compared to white women (p=0.04) and that their portion sizes of fish was significantly greater (p<0.0001). Murkin, Cole, Kearney, Sheeshka and Dawson (2003) conducted a study on frequent consumers of Great Lake fish and found that Asian Canadians had a greater consumption of fish from the Great Lakes. They bought fish from grocery stores more frequently, reflecting the importance of fish in the Asian-Canadian diet (Murkin et al., 2003).

There are cultural differences in how fish is prepared and cooked. Murkin et al. (2003) found that the Asian-Canadians in their study removed less fat from the fish while cooking and had tendency to eat all parts of the fish, thereby increasing their chance of consuming contaminants other than MeHg, such as polychlorinated biphenyls. In addition to preparation and cooking differences, Chinese-Canadians also tend to consume fish that are not frequently tested by, or acknowledged by, Canadian regulatory agencies or local fish advisories such as silver pomfret, milkfish, shiner, skate, smelt, etc. (Del Gobbo et al., 2010).

1.4 Fish Advisories

Due to the potential risks of consuming some types of fish, many provinces in Canada have issued fish advisories. The purpose of these advisories is to protect individuals from possible risks of consuming contaminated fish and also to limit their intake of some species to minimize methylmercury exposure within certain populations or sub-groups of populations (i.e. pregnant women, children) (United States Environmental Protection Agency, 2009).
As previously mentioned, Health Canada (2008) has specific consumption advice for the general population, specified women, and children between the ages of 1-4 years old and 5-11 years old (Table 1). In addition to this, provinces in Canada have available fish advisories for their regions and information about their responsible agencies available to consumer’s online (Environment Canada, 2010).

Specifically for Ontario, the Ministry of the Environment and the Ministry of Natural Resources collaborate every two years to produce a Guide to Eating Ontario Sport Fish (Ministry of Natural Resources, 2011). This guide contains information regarding mercury, PCBs and other contaminants for sport fish in more than 1,950 bodies of waters in Ontario for over 10,000 fish samples (Ministry of Natural Resources, 2011). This guide also provides diagrams of where the contaminants are located in fish and also demonstrates ways in which to limit consumption of contaminants. However, this resource is difficult to locate on the Ministry webpage and is extremely lengthy. This creates barriers for consumers to access this information and is especially difficult for those whose native language may not be English.

1.4.1 Awareness of Fish Advisories

It has been shown that many women are generally unaware of their local fish advisories; in one study more than 80% of the women were unfamiliar with information about mercury and fish during pregnancy (Gliori, Imm, Anderson, & Knobeloch, 2006). Knobeloch, Anderson, Imm, Peters and Smith (2005) conducted a telephone survey using a standardized questionnaire to obtain information regarding demographics, fish consumption habits, and awareness of advisories. They found that awareness rates ranged
from 8 to 32% among their sample. This sample however is unrepresentative of our population of interest (i.e. Chinese-Canadians), as researchers were only able to recruit 2 individuals’ representative of Asian/Pacific Islander background. Similarly, Beehler et al. (2003) conducted 4 focus groups with 33 participants and found that only a few individuals were aware of the fish advisories and many ignored the information and disregarded the importance of the advisory. Researchers suggested that future research focus on a more effective way to communicate this information to these women.

Research supports that many women are generally unaware of fish advisories, however those who are aware tend to significantly decrease their overall intake of fish (7.7% vs 6.4%, p<0.001) (Oken et al., 2003). In addition, fewer participants consumed more than 3 meals of fish per week after an advisory was distributed (15% vs 11%; p<0.001) (Oken et al., 2003). Oken and colleagues (2003) conducted a prospective cohort study to estimate the extent to which women’s intake of fish declines due to concerns of methylmercury contamination using a semi-quantitative food frequency questionnaire after each trimester of pregnancy. They found that on average, there was a decline in fish consumption (i.e., total fish, canned tuna, dark meat fish, white meat fish) after an advisory was implemented when compared to before the advisory was distributed. However, the sample used in this research had very few Asian participants, seven were surveyed before the advisory and 5 were surveyed after an advisory was released (Oken et al., 2003).

Similarly, Silver et al. (2007) found that women who were aware of the EPA and FDA fish advisory lower intake of fish, equivalent to seven grams, than women who did not. This demonstrates the need for information emphasizing both the benefits and the
risks of fish consumption so that women can make an educated choice and perhaps continue to consume fish in a way that minimizes the risks but maximizes the benefits.

1.5 Communicating Messages Effectively

Health professionals are able to communicate the risks and benefits of consuming fish to a group of women; however it is essential to communicate these messages effectively, in culturally-appropriate ways. Connelly and Knuth (1998) conducted a mail survey asking respondents to compare 4 different elements of health advisory information including reading level, graphics versus text only, commanding versus a cajoling tone and quantitative versus qualitative information. Researchers identified that not one presentation format was better than another; however there was a strong preference for a cajoling versus a commanding tone in health messages providing information to at-risk individuals. In general, the type of presentation format that was found to be helpful was dependent on the target audience.

According to Beehler, McGuinness and Vena (2003), ethnic populations tend to perceive their experiences and respond to risk differently than the dominant culture. This emphasizes the need for a more specific and customized approach to educating women of different ethnicities on health risks and benefits.

Currently, most resources educating women on the risks and benefits of consuming fish during pregnancy are available in a brochure format. Many of these resources however, are not suited for women of different ethnicities. Previous Master’s thesis work by Fung (2009) conducted a needs assessment of Chinese-Canadian women and fish advisories. Fung (2009) showed a sample of Chinese-Canadian pregnant women
from the Greater Toronto Area a number of fish advisory resources and found that in general, many of the resources lacked culturally appropriate information, such as culturally appropriate examples of fish. Also, for most women English was not their native language; many of these resources were available in English only and even the resources available in Chinese were very text-dense (Fung, 2009). Researchers also found that ease of access to the information is crucial, especially for mothers with young children since they lack time to sit down and read a lengthy brochure – straightforward, simple, clear and concise information is valued amongst this population (Fung, 2009). This previous research is vital as it had informed and provided rationale and a needs assessment for the current research project.

In addition, Burger et al. (2003) found that women who were in the classroom setting had a greater understanding of fish, benefits and contaminants than those given a brochure. The benefits are said to be from the additional time devoted to each problem, use of multiple modes of reinforcing the same message, and the fact that the presenter was engaging and interactive. Murkin et al. (2003) found that Asian Canadians had a tendency to get their information regarding fish contaminants from friends. This adds to the potential confusion already surrounding information on fish and mercury contamination. A simple message in an accessible format, from a legitimate source is needed to prevent confusion among consumers.

Smith and Sahyoun (2005) acknowledged that there needs to be more collaboration between the fish industry, government organizations, public health and other organizations to create appropriate media messages targeted at specific at-risk populations to advise them about the risks and benefits of fish consumption.
1.6 **Community-Based Participatory Research**

Not only is collaboration between various organizations key, community involvement is being recognized as increasingly important in the research process as well.

CBPR has been defined in several different ways, however all definitions suggest that it is research conducted in a manner that involves community members, organizational representatives and researchers in all aspects of the research process to help minimize health disparities (Ramsden, McKay, Crowe, 2010). This differs from traditional research in that CBPR enables community members to identify issues that are of relevance and importance to them and they are able to influence and control the decisions that affect their communities (Ramsden et al., 2010; Sloane et al., 2003).

This research process builds upon the strengths of the identified community and requires transparency and trust between the community, researchers and organizations involved (Sloane et al. 2003; Ramseden et al. 2010).

1.6.1 **Benefits of using Community-Based Participatory Research**

What is most unique and important about CBPR is that it responds to the community needs and culture rather than imposing a preconceived idea (by academic researchers or organizations) of what would help the community (Sloane et al., 2003; Israel et al., 2005).

Other benefits as identified by Israel et al. (2005) include enhancing the relevance and application of the research question by making the question relevant to the needs and concerns of the community.
CBPR research brings together individuals with various skills and assets to help address complex problems as identified by the community. By involving the opinions and suggestions of community participants, this enhances the “quality, validity, sensitivity, and practicality of research” (Israel et al., 2005). Often, at risk communities that are of interest to researchers may feel like “subjects” who are being studied. CBPR gets the community involved and helps these communities establish trust and build relationships with researchers and organizations.

Lastly, CBPR aims to improve the health and well-being of the involved participants and their respective communities.

1.7 Conclusion

The current literature review suggests that there are many benefits to fish consumption for both the mother and the infant. In addition, consumers must also be conscious of the risks of fish consumption from contaminants such as MeHg. Due to these risks, Health Canada has issued advice on consuming large predatory species of fish for specified populations such as women who are breastfeeding or who are or may become pregnant, children and the general population. Fish advisories have also been implemented to educate consumers on safe fish consumption; however, research shows that many women are unfamiliar with the fish advisories or if they are aware of them, their fish consumption tends to decrease.

Previous Master’s thesis work demonstrated that current fish advisories are not culturally sensitive especially to the Chinese-Canadian population. These populations consume different species of fish and have different preparation and cooking methods.
Using the work of Fung (2009) as a basis and a needs assessment for the current research project, it was identified that there is a need for culturally appropriate, relevant resources acknowledging both the benefits and the risks of fish consumption during pregnancy. This is particularly true for Chinese-Canadian women as their diet typically includes large amount of fish. In addition, these resources need to be created with involvement from the community, academia and local organizations.
CHAPTER 2: RESEARCH OBJECTIVES AND QUESTIONS

2.0 Research Objectives

There are currently very few resources on the issue of fish and methylmercury contamination available for many ethnic populations in Canada. Most resources that are available are in the form of pamphlets and there have been issues regarding the cultural appropriateness of these resources, including a language barrier and using culturally appropriate species of fish (Fung, 2009). Previous Master’s thesis research was used as a needs assessment for the current research project. It was determined in this research that accessibility of information is important to Chinese-Canadian women of childbearing age (Fung, 2009). These women identified non-print resources such as videos and online links as being valuable educational tools (Fung, 2009).

There is a need for culturally appropriate, relevant resources acknowledging both the benefits and the risks of fish consumption during pregnancy (Fung, 2009). This is particularly true for a Chinese-Canadian population since their culture tends to consume a larger consumption of fish and they appear to have a lower awareness of fish advisories (Anderson et al., 2004). The objective of this study was to use a Community Based Participatory Approach and the results of a needs assessment previously conducted by Fung (2009) to develop videos on the topic of consuming fish during pregnancy.

The Chinese-Canadian women sampled in this study were Mandarin-speaking women of reproductive age from the Greater Toronto Area who were involved in the Toronto Public Health Peer Nutrition Program. The Peer Nutrition Program provides education and support to help mothers provide their children with quick and nutritious
meals. The program provides women with culturally adapted and translated resources, is available in different languages and is led by Community Nutrition Educators with the support of Registered Dietitians (City of Toronto, 2009).

The needs assessment research conducted by Fung (2009) involved a sample of Chinese-Canadian women participating in Canada Prenatal Nutrition Programs. Therefore, the first step in the present research was to present these findings to a sample of Mandarin-speaking Chinese-Canadian women in the Peer Nutrition Programs (PNP) to ensure that the information and skill needs of both groups of women were comparable.

2.1 **Research Questions**

The following research questions are specific to participants of the Peer Nutrition Programs (PNP):

1. Are the desired information and skills identified in Fung’s (2009) research with Mandarin-speaking Chinese-Canadian women in Canada Prenatal Nutrition Programs relevant for Mandarin-speaking Chinese-Canadian women in PNPs?

2. Are various characteristics of the videos (e.g., content, examples, length and style) appropriate for our target audience?
CHAPTER 3: METHODS

3.0 Six Guiding Principles of Community-Based Participatory Research

There are six principles of Community-Based Participatory Research as identified by O’Fallon and Dearry (2002, pg 155-157):

1. “Promotes active collaboration and participation at every stage of research”
2. “Fosters co-learning (between community residents and researchers)”
3. “Ensures projects are community-driven – guided by (health) issues or concerns of community members”
4. “Disseminates results in useful terms - results are communicated to all partners in culturally appropriate, respectful, and understandable terms.”
5. “Ensures research and intervention strategies are culturally appropriate”
6. “Defines community as a unit of identity – this is defined by those whose health is most likely to be affected by research”

By using these principles of CBPR, researchers can effectively develop and communicate many different health messages to specific populations, including the risks and benefits of fish consumption during pregnancy.

3.1 Rationale for Using a Community-Based Participatory Research

A modified community based research approach was decided upon when developing the videos for the current population since many fish advisories currently available to these women were developed without the input or participation from the target audience for this study, Chinese-Canadian women of reproductive age.
Additionally, a modified approach was used since it may not always be necessary and may not be feasible, in terms of time and funding, to do so for each step in the process (Bogart and Uyeda, 2010).

As previously mentioned, the main objective of community based research is to involve and encourage participation from members of the community in the process of creating knowledge (Viswanathan, 2004), which enhances the value and relevance of the research to the population of interest (Westfall, VanVorst, Main, Herbert, 2006).

Research conducted by a previous Master’s student identified that Chinese-Canadian women did not have adequate knowledge of fish advisories, and found many of the available resources to be inadequate for their culture and needs (Fung, 2009). Meyer et al. (2003) identified a growing concern that immigrant and minority women are not always included in the research process. Excluding these important individuals would make the findings less likely to be representative of all women, which could potentially result in stress, lack of preventative behaviours, lower use of health care and poorer health status, especially for immigrant women (Meyer et al., 2003).

3.2 **Phase 1: Pre-Video Discussion Groups**

3.2.1 **Needs Assessment**

In 2009, Fung conducted a needs assessment with a group of pregnant Chinese-Canadian women analyzing 6 current fish advisory resources. Feedback and suggestions regarding these resources included: addressing language barriers, using culturally appropriate examples of fish, and including pictures with both English and Chinese
names to aid in fish identification. The main recommendation from Fung (2009) was to create videos since women expressed concern that they didn’t have time for reading pamphlets or brochures. The general topics for videos were suggested (e.g., what is mercury and where does it accumulate in the fish, etc.) but preferences for the style or format of the videos were not given.

Drawing from this earlier research, the research objective of this study was to seek input from the community of interest using a Community Based Participatory Approach and to use the results of a needs assessment conducted in previous research to develop videos on the topic of consuming fish during pregnancy. The present study was to create 2 short videos, each approximately 3 to 5 minutes in length educating women on the benefits and risks of fish consumption. Researchers thought that developing short educational videos to be implemented in nutrition programs would be an effective way of communicating these topics to this group of women (Fung, 2009). Videos are also versatile in that they may be used in programs to supplement their current nutrition curriculum. Research shows that participants who had attended a classroom session versus being given printed material had a greater understanding of the information compared to those who read a pamphlet (Burger et al., 2003). In addition, the Chinese-Canadian women in the needs assessment indicated that videos are useful as they may be uploaded onto the internet for easier access (Fung, 2009).
3.2.2 Sampling Methods

3.2.2.1 Small Group Discussion Participant Recruitment

Chinese-Canadian women were recruited from the Peer Nutrition Program (PNP) across Toronto and through an e-mail listserv within the Guelph community. Researchers conducted discussion groups with women who met inclusion criteria: 1) being of child-bearing age, pregnant or having a child between the age of 0 to 6 years; 2) being of Chinese descent; and 3) consuming on average at least 2 meals of fish per week. The intent of conducting small discussion groups was not to reach theoretical saturation, as the current research project follows work done by a previous Master’s student who had conducted a needs assessment with Chinese-Canadian women in the Toronto area (Fung, 2009). Participants in the previous research were recruited from Canadian Prenatal Nutrition Programs, whereas the participants of the current research were recruited from Peer Nutrition Programs. Thus, the purpose of the small discussion groups in the present study was to ensure that the women from both groups had similar needs when developing resource material.

Purposeful sampling of Peer Nutrition Program sites was conducted. A list of predominantly Mandarin-speaking PNP groups was given to the student researcher from a member of Toronto Public Health as well as a contact person (a Community Nutrition Educator) for these groups. Researchers contacted the point person for Mandarin-speaking PNP groups, and this point person was e-mailed recruitment posters written in both English and Chinese (Appendix A). This individual also helped to recruit women
from the program who met eligibility criteria. Interested women participated in one
discussion group held at a local community centre in the east end of Toronto.

Women from the Guelph area were recruited by distributing a recruitment poster
through the University of Guelph International Student listserv. Interested participants
who met eligibility criteria contacted the primary student researcher and a group
discussion was organized at the University of Guelph.

All participants had to complete consent forms and demographic questionnaires
(Appendix B and C). All participants were given a $25 gift card for their time. In
addition, women in the Toronto discussion groups were provided with childcare and bus
tokens to help get them to and from the community centre.

3.2.2.2 Rationale for Using a Convenience Sample

A convenience sample was used because it is an easy, quick and inexpensive way
to recruit participants (Singleton and Straits, 2010). This research project included a
preliminary feedback of nutrition education videos, therefore generalizability of the
research is less critical and convenience sampling is appropriate for use in the project
(Singleton and Straits, 2010).

3.2.2.3 Limitations of a Convenience Sample

There are many limitations however, to using a convenience sample. First, a
convenience sample does not utilize methods of random selection, therefore three main
weaknesses include: not being able to control for researcher bias in selecting individuals,
or subject self-selection bias, and a pattern of variability cannot be predicted, meaning
that researchers are unable to calculate sampling error or to estimate sampling precision (Singleton and Straits, 2010).

3.2.3 **Script and Storyboard Creation**

A script is the blueprint for the shooting and editing of videos, and it must have a clearly defined goal (Teaching Support Services, n.d.). A storyboard is a visualization of the script, illustrating angles and shots to be filmed, to help the director while filming.

The content for the educational videos was drawn largely from the needs assessment work done by Fung (2009) and in collaboration with individuals from the Chinese-Canadian community in both the Guelph and Toronto areas, and a review of evidence and fish advisories from Health Canada and Toronto Public Health. Members of the community were able to offer a consumer’s perspective on fish consumption as well as a cultural perspective on Chinese traditions.

Women in the discussion groups were asked three open-ended questions:

1. What would you like to see in a video about eating fish during pregnancy?
   
   Probing Question: We will have information in the videos such as benefits and risks of consuming fish, what the contaminants are, recommend serving sizes etc. What other type of information would you like to see demonstrated in the videos that you would find helpful when either choosing fish in the grocery store or helping prepare fish for your family?

2. Which specific fish species would you like to see as examples in the videos?
3. What type of visuals would you like to see in the videos (i.e. pictures of fish, a schematic ranking of the mercury content of fish in relation to one another, picture of parts of the fish? Whole fish?)

By enabling the Chinese-Canadian community to participate in the development of the video content, the videos become more relevant and the community can have a greater sense of ownership of the videos (Bogart and Uyeda, 2009)

3.3 **Phase 2: Video Creation**

3.3.1 **Filming the Footage**

Videos were filmed at various locations including the University of Guelph, individual homes and a grocery store. Permission was obtained from all locations prior to filming.

Actors were recruited from the Applied Human Nutrition graduate program as well as through contacts in the community. Actors were given a $50 gift certificate for their time and contribution to the video. Filming was completed by the primary student researcher and a student assistant who had previous experience using a video camera.

Teaching Support Services (TSS) at the University of Guelph allowed researchers to use their studio and software to edit the videos. The primary student researcher edited the video with professional help from the staff at TSS.

Videos were created in Mandarin since many of the women who participated in the previous small group discussions noted that this would be beneficial to their understanding of the topics at hand.
3.4 **Phase 3: Preliminary Feedback on Videos**

3.4.1 **Viewing the Videos**

Once the videos had been developed, researchers re-visited the earlier communities to show the videos to another group of Mandarin-speaking women to gather opinions of the videos, and also to demonstrate to the women the final products from the previous discussion groups, thus fulfilling CBPR guidelines.

As in phase 1, participants for the discussion groups were conveniently sampled from the Toronto area. The point person from the Peer Nutrition Programs was able to help recruit women for the video viewing and an e-mail was sent out to a listserv through the University of Guelph. Interested participants were given the time and location of the meeting. All participants were given a $25 gift card as an incentive. In addition, women in the Toronto discussion groups were provided with childcare and bus tokens to help get them to and from the community centre.

Participants were given a list of ideas and/or suggestions that the prior small discussion group had identified as being important to include in the videos. Participants then watched the videos and answered a questionnaire asking how well the researchers incorporated the concerns/ideas of these women into the video, and what did they enjoy the most and the least about the videos.

In addition, prior to viewing the videos, the Chinese-Canadian women were also asked about their knowledge regarding information on fish and mercury consumption. After the videos were shown, they were asked the same survey questions again to gauge
whether or not participants had gained information from the videos. Questionnaires were available in both English and Mandarin to best accommodate participants (Appendix D).

3.5 **Data Collection and Analysis**

3.5.1 **Transcription of Interviews**

Small group discussions were digitally recorded and transcribed to help facilitate data analysis. Since the discussion groups were conducted in Mandarin, interviews were simultaneously transcribed and translated into English. Back translation was unnecessary for the current study since data were simply summarized and categorized.

Survey questions were translated from English to Chinese and answers were translated from Chinese to English with the help of a Mandarin-speaking translator.

3.4.2 **Accurate Description**

Interview transcripts and discussion questions were analyzed using accurate description. According to Strauss and Corbin (1990), researchers are to present an accurate description of what is being studied, but they do not have to necessarily present all the data. Data is taken at face-value with minimal interpretation from researchers to ensure that what is being reported is accurate (Strauss and Corbin, 1990).
CHAPTER 4: RESULTS

4.0  Phase 1: Pre-Video Discussion Groups

4.0.1 Profile of Discussion Group Participants

A total of 28 women participated in the two discussion groups held in Toronto and Guelph and met the inclusion criteria of: 1) being of child-bearing age, pregnant or having a child between the age of 0 to 6 years; 2) identify as being of Chinese descent; and 3) consume on average at least 2 meals of fish per week. Two discussion groups were conducted in the Guelph and Toronto areas; participants were recruited between the months of February and March and all women were Mandarin-speaking. The nine women that participated in the Guelph discussion groups were recruited from the University of Guelph International Student Listserv. The remaining 19 women who participated in the Toronto discussion groups were involved in the Peer Nutrition Program run by the City of Toronto, Toronto Public Health. There was a snowball effect when recruiting for the Toronto discussion groups generated by the Chinese-Canadian women themselves. This reflect self-selection bias, however also demonstrates enthusiasm and willingness to participate in the research project.

Of the 28 women, the majority were from Northern China (n= 9), Northeast China (n=5) or South Central China (n=8). The rest were dispersed amongst Eastern China (n=3), Southwest China (n= 2) and Northwest China (n= 1). Many of the women had lived in Canada for less than 10 years. Most of the women have lived in Canada for more than 5 years up to 10 years (n= 10), followed by more than 1 year up to 5 years (n= 9)
and less than one year (n= 5) with the least amount of women living in Canada for longer than 10 to 15 years (n= 4).

4.0.2 Analysis of Common Ideas

Discussion group participants were presented with a list of common ideas generated by the previous needs assessment conducted by Fung (2009). Suggestions included general information regarding benefits and risks of fish consumption, such as what is mercury and where are contaminants accumulated in fish. Participants in the current discussion groups agreed with the ideas and suggestions presented in the previous needs assessment. These suggestions and ideas were analyzed in addition to any new information using accurate description. Ideas were divided into two different categories, information to be included in the videos and technical aspects of filming. Information to be included in videos was then further divided into the two different videos that researchers will be creating: informational video and a practical portion.

4.0.3 Information to be Included in Videos

Based on the data collected by Fung (2009) and these two discussion groups, the researchers made the decision that the first video should provide general information regarding the benefits of fish and risks from contaminants. The women were interested in issues such as where the contaminants accumulated in the fish, as many thought that the fish head was where methylmercury was accumulated, and how the contaminants are accumulated in the fish. Regarding the benefits of fish, the women noted that they would first like to see benefits for the child and following that the mother, since the younger
generation is a major priority for these women, which was also seen in previous research (Fung, 2009). They were also interested in knowing the nutritional content of fish, including important vitamins and minerals that individuals can receive from consuming fish, as well as comparing fish to other sources of protein (i.e. beef, pork and chicken). Consumption guidelines were also touched upon with these women and researchers used Health Canada advice of 150 g of fish per month or the equivalent of two Canada’s Food Guide servings or 1 cup of fish for the six species of fish that are the highest in methylmercury.

The researchers decided that the second video would be more practical, such as including key skills that participants are able to use in everyday life. Information included identifying common fish consumed by this population that have high levels of methylmercury. The difference between imported and local fish was also of interest to this group of women. Tips on how to choose fish that may contain lower levels of contaminants were included in the video, since many women wanted to be able to identify fish that are considered lower in contaminants when grocery shopping. Although fresh fish is preferred by many Chinese-Canadians, sometimes it is unavailable and these women turn to frozen or canned fish products. Therefore they were interested in noting nutritional differences between fresh, frozen and canned fish and also on tips on how to choose “healthier” canned fish to help minimize contaminants. A particular interest to these women, as many of them cook for their own families, was how to prepare and cook fish to help minimize contaminants and increase the benefits of fish relative to the risks.
4.0.4 Technical Aspects of Filming

The women wanted the videos to be practical and ‘real-life’, and recommended filming in a grocery store and walking around showing whole fish to help them in identifying these species when grocery shopping. Using graphs and/or charts to depict the level of mercury in different species of fish was also identified as being useful for these women, in addition to showing both the English and Chinese fish names to aid in grocery shopping.

When asked about the delivery style of the information, there were dissimilarities between the Guelph and Toronto discussion groups. The women in the Guelph discussion groups were interested in seeing an informal discussion between two people discussing the matter at hand whereas the women in the Toronto group wanted to see more of a documentary style video with the information being delivered by a health professional, such as a Registered Dietitian. Therefore, the decision was made by the researchers to make the informational video a documentary style and the second video, an informal, interactive style.

4.1 Phase 2: Video Creation

4.1.1 Script and Storyboard Development

The first video was educational, identifying topics such as: fish as an ideal protein source compared to beef, pork or chicken, identify the benefits and risks of consuming fish for the mother and child, explain the mercury bioaccumulation process, Health Canada advice and lastly, summarizing the important points of the video. Researchers
decided to base the video on a Chinese-Canadian couple who were expecting their first child, so that the women could relate to this couple, as most of the women in the PNP groups either were pregnant or had a young child. The couple was going to their doctor’s office to learn more about eating fish during pregnancy, since the majority of the Chinese-Canadian women had indicated they would like a health professional giving them the information. To give the video different dimensions, visuals were created on the editing software to create diagrams to help the woman understand the concepts and topics that were being discussed.

The second video was filmed in a grocery store and this video was more practical, giving the Chinese-Canadian women tips on how to prepare, cook and choose fish that may contain less contaminants than others.

Voice-overs were used in both videos - this is when the audio from the footage is cut out and is replaced with a pre-recorded audio script. This is a less complicated method to film and edit the videos; also, since the actors are not professional, this created less burden on them for having to memorize script lines. The script can be found in Appendix E.

4.1.2 Filming and Editing the Videos

Filming took place at three different locations, the University of Guelph Health and Performance Centre, a home and at a local grocery store. Filming the footage was a relatively short process, ranging from 30 minutes to 2 hours. For the first video, a script was not followed, since voice-overs were to be used during the editing session. Actors were told to act as if engaged in an interesting conversation and to use hand gestures and
movements while talking to entice viewers. The second video was more straightforward to film, as the concept required very simple footage of the grocery store and ‘panning’ the fresh fish and frozen fish aisle.

After filming, the researcher used the editing software Adobe Premiere Pro CS4 Version 4.2.1 to edit the footage. The editing process was much longer, spanning 3 weeks. The student researcher followed the storyboard to create visual diagrams to educate Chinese-Canadian women on mercury and fish. Links to videos can be found in Appendix F.

4.2 Phase 3: Preliminary Feedback of Videos

4.2.1 Profile of Discussion Group Participants

A total of 20 women viewed the final videos and completed questionnaires. Participants were recruited from Peer Nutrition Programs with the help of a Community Nutrition Educator who telephoned individuals from the program and asked if they were interested in watching videos about the benefits and risks of fish consumption. Participants met the inclusion criteria of: 1) being of child-bearing age, pregnant or have a child between the age of 0 to 6; 2) identifying as being of Chinese descent; and 3) consuming, on average, at least 2 meals of fish per week.

In phase 3, all participants were recruited from the Peer Nutrition Program as the Guelph community did not express interest in participation. Participants from phase 1 and phase 3 also differ in that the Peer Nutrition Program is run throughout the year with different individuals participating each time. Since all participants in phase 3 were
recruited from the Peer Nutrition Program, demographics were not taken as it is assumed that women attending PNP groups have similar attributes as the women that participated in the previous small group discussions.

4.2.2 Perceptions of the Videos by the Chinese-Canadian Women

Chinese-Canadian women were given a list of ideas and suggestions of what to include in videos, generated from the needs assessment conducted by Fung (2009) and the two discussion groups held in phase one. These participants were asked to rate how well the two videos incorporated these ideas and suggestions, using the descriptors “excellent”, “good”, “fair” or “poor”. Sixteen of the 20 women rated the inclusion of ideas as “excellent”, whereas only 4 had rated it as “good”. This indicates that researchers were able to adequately include topics of interest and importance to these women into the educational videos.

When participants were asked what they enjoyed the most about the videos, many noted that they liked how information was included on choosing fish while grocery shopping and how to cook fish to help minimize the consumption of contaminants. This suggests that the Chinese-Canadian women found the practical information more useful than the educational information (i.e., how does mercury accumulate in fish, what is mercury?, etc.). The majority of the women enjoyed the video, although a few noted that there was too little content and wanted more information about fresh water fish and fish that are suitable for eating. Some participants mentioned technical aspects that they did not enjoy, such as information presented too quickly, and inconsistent volume.
Suggested improvements and changes that were noted on the questionnaires included using photographs to identify specific fish species that they are able to consume and broadening the scope of the videos to include shellfish as well.

4.2.3 Pre- and Post-Video Questions

Pre- and post-video questions were posed to participants (Appendix D). The questionnaire consisted of open-ended questions regarding various aspects of the videos, e.g., the benefits and risks of fish consumption, information regarding PCBs and ways to minimize consumption of contaminants. Women were asked to answer these questions to the best of their ability after watching the videos. The intent of this was to gain a sense of what potential impacts of viewing the video had on this group of Chinese-Canadian women. Researchers acknowledge flaws in using this methodology, as a pre- and post-video questionnaire is not a rigorous assessment. The purpose of the questionnaire was not to conduct a formal outcome evaluation, however to gain a general sense of what information the women found most valuable from the videos.

4.2.3.1 Benefits and Risks of Fish Consumption

A list of questions was given to participants before and after watching the videos. Results of the pre-video questionnaire demonstrated that many Chinese-Canadian women were aware of the benefits of consuming fish during pregnancy, with “good for the baby’s brain development” as one of the top answers. Other benefits acknowledged included, rich in omega-3 and DHA, good source of protein and many vitamins. Many women were aware of the risk of mercury contamination, while few knew about PCBs.
However, only a few women noted that larger fish contained greater levels of contaminants.

After watching the videos, the women were able to identify benefits of fish consumption for the mother and additional benefits for the baby. Participants also acknowledged the omega-3 and 6 benefits of fish consumption and that fish is lower in cholesterol than other types of foods high in protein, and can reduce the risk of heart disease.

4.2.3.2 Information Regarding Mercury and PCB

When asked before viewing the videos where mercury and PCBs are accumulated within the fish, many answered that mercury accumulated in the fish head, bones and intestines, while PCBs accumulated inside the fish head, bones, intestines and gills. This suggested that few women were aware that mercury accumulates in the fish flesh, and PCBs are deposited in fatty areas of the fish.

Post-video, women were able to accurately identify fish stomach, meat, eggs and skin as areas that accumulate contaminants however, there was still confusion between which parts of the fish accumulate mercury and which accumulate PCBs.

4.2.3.3 Ways to Reduce Consumption of Contaminants

Before watching the videos, there were varying answers when asked how they could minimize their consumption of these contaminants including, prolonging the cooking time or cooking at high temperatures, adding soy sauce or vinegar and removing the head of the fish. Other incorrect answers included removing the intestines (to limit
consumption of PCB’s) and cleaning the fish properly. After watching the videos, participants were able to identify more accurate ways of limiting their consumption of contaminants including grilling, broiling or baking fish, not eating the fish organs or eggs, not re-using the oil used to fry the fish, and limiting the consumption of fatty parts of fish such as fish skin and liver.

After watching the video, participants were asked how to choose fish to limit consumption of contaminants. Participants were able to identify that choosing smaller fish will help reduce the intake of contaminants as well as following the Toronto Public Health fish guide. Additionally post-video, participants identified choosing a variety of fish species as a method of limiting consumption of contaminants.

As previously mentioned, there are limitations of conducting a pre- and post-video survey, particularly the weak methodology being used. However, the intent of the pre- and post-video questionnaire was to gain a sense of what potential impacts of viewing the video had on this group of Chinese-Canadian, not to conduct a formal outcome evaluation of the videos which should be the focus of future research.
CHAPTER 5: DISCUSSION

5.0 Using Culturally-Sensitive Videos to Educate Groups of Women

The videos were well-received by the Chinese-Canadian women and there is some indication that some women who viewed the videos learned information about fish consumption during pregnancy. Participants valued information from video 2 regarding choosing fish and how to cook fish to reduce consumption of contaminants over information in video 1 which included more scientific information such as an explanation of where the contaminants were located. Perhaps researchers needed to better emphasize these points in the video, or find a different approach in explaining the concepts. The first video also contained a lot of information regarding the risks and benefits of fish, and some participants noted that the video pace was too fast to fully comprehend the information. Therefore additional editing is required to add in more pauses after important points or repeat important points.

Overall, the videos were well-received by the community and researchers can attribute this to the use of CBPR methods in developing the resource.

5.1 Revisiting the 6 Principles of CBPR

Throughout the development of the videos, theory was used to provide insight and strategies on how to create effective videos that would hopefully have an impact on the target audience (Glanz, Rimer & Viswanath, 2008). Theories are useful during the many stages of planning, implementing and evaluating interventions (Glanz, Rimer & Viswanath, 2008). Programs and interventions that have been theoretically informed are
believed to be more effective in changing health behaviours than those that are not (Painter, Borba, Hynes, Mays & Glanz, 2008).

Community-based participatory research is considered to be both a theory and an approach that promotes community involvement in community-based interventions and research, to help build community capacity (Bogart and Uyeda, 2009), and to help minimize health disparities (Ramsden, McKay & Crowe, 2010). Community-based participatory research can be applied in many different contexts, however it is primarily used in low-income and culturally different communities (Israel, Coombe, Cheezum, Schulz, McGranaghan, Lichtenstein et al., 2010).

A CBPR approach was used in developing the current videos for a Chinese-Canadian women of childbearing age. There are 6 principles to CBPR and researchers addressed each principle throughout the research process (O’Fallon and Dreary, 2002, pg 155-157).

First principle of CBPR included “promoting active collaboration and participation at every stage of research”. Previous research with Chinese-Canadian women suggested that it would be useful to create videos to educate these women on the topic of consuming fish during pregnancy (Fung, 2009). Researchers further involved the community by conducting small discussion groups to assess their information needs before creating the videos, to ensure that the women in CPNPs did not have different suggestions and needs than women in PNPs. The videos were shown to another group of women who answered questions regarding their likes/dislikes of the videos.

Similarly, the second principle “fostering co-learning between the community and researchers” was attained through the small group discussion and the viewing of the
videos. Researchers were able to learn more about the needs of the community and the differences between Chinese and Western culture whereas the community was able to gain more knowledge on the risks and benefits of consuming fish during pregnancy.

The current research project was community-driven and guided by the issues or concerns of community members since it stems from the work of previous research with Chinese-Canadian women. Additionally, topics and issues were identified as being important to the community through small discussion groups, thus fulfilling the third principle of CBPR.

The fourth principle of “dissemination of results in culturally appropriate, respectful and understandable terms” was addressed by creating the videos in Mandarin, and using visuals and diagrams that would help the women understand the concepts being discussed.

Researchers ensured that videos were culturally appropriate by basing the script and filming on the work of Fung (2009) and the two additional discussion groups that were held. The discussion included technical aspects of filming the video (i.e. filming location, who they wanted to see educate them about the information etc.)

Lastly, researchers defined the Chinese-Canadian community as a unit of identity and focused on this group of women as their health was most likely to be affected by the videos and research project.

5.2 Using CBPR to Develop Videos on Health Information

An important aspect of CBPR is to maintain a running dialogue with the community of interest and to assess the goals of the particular project (Bogart and Uyeda,
2009), which is what researchers were able to accomplish throughout the development of the videos. Fung (2009) found that Chinese-Canadian women were not aware of fish advisories and were not satisfied with current resources, and suggested the use of classroom structured approaches. Thus, the feedback and ideas of the Chinese-Canadian women drove the idea of developing videos that could be implemented in prenatal nutrition programs to help educate them on the issue of mercury and fish consumption. Additionally, to determine the content of the videos and how they should be filmed, the researchers went back to the Chinese-Canadian community to ensure that the ideas were relevant to a group of women in a slightly different prenatal program. Using the work of Fung (2009), researchers had a general idea of what this population would like to see incorporated in videos including addressing language barriers, using culturally appropriate examples of fish, and including pictures to aid in fish identification. In addition, the small discussion groups in the current study really informed researchers about specific likes/dislikes and content for the videos. The women added much detail and depth into the script, helped guide the direction of video development and tailor it to their community. Using the input from the Chinese-Canadian community, the videos were then created solely by researchers as time and resources did not allow for the community to be involved in this step of the process.

Dissemination of results beyond publication is considered a fundamental aspect of CBPR (Chen, Diaz, Lucas & Rosenthal, 2010), therefore it was important to go back to the community to show the videos to ensure that ideas were incorporated appropriately and to the liking of the community.
The Chinese-Canadian community had been consulted throughout the entire process therefore increasing the relevance of the video. Including them in the process also provides transparency between the researcher and the community, making them feel less like “subjects” as they may feel in traditional research that does not involve the community every step of the way. Trust is built upon communication and it is believed that a relationship was formed between researchers and the community. Trust enables researchers to gain more knowledge of the community through research and also helps empower the community by building capacity and by helping community members have a greater understanding of research and their important role within it.

Traditional research often follows a top-down approach, whereas the novelty and uniqueness of CBPR is that it follows a bottom-up approach allowing at-risk populations to determine the research question and objectives, participate in data collection and gain knowledge through the entire research process to help reduce gaps in health disparities (Ramsden, McKay & Crowe, 2010). Although the current research may not have implemented a full CBPR process (e.g. establishing a community advisory board, involving community in recruitment or data analysis), it may not always be necessary and may not be feasible, in terms of time and funding, to do so (Bogart and Uyeda, 2010). The most critical part is that communication was kept between researchers and community and that they kept a balanced power relationship (Bogart and Uyeda, 2010).

5.3 **Strengths and Contributions to Current Literature**

Strengths of the current research study include the use of a group interview to collect data. This approach offers a balance between researchers, group interview
moderator and participants since the group interaction allows participants to feel at ease and have the ability to talk to one another and develop ideas, which could not happen in an one-on-one interview or a focus group setting which has a more structure approach. This ability to develop ideas within group settings may empower the voice of the Chinese-Canadian community in the relationship between the research, moderator and participants, giving their ideas and thoughts more validity and importance (Denzin & Lincoln, 2000; Madriz, 2000 as cited in Israel, Eng, Schulz, & Parker, 2005). Use of group interviews is particularly useful in cultures that value collectivity (Israel et al., 2005), such as the Chinese community.

There is limited research in the current literature on developing culturally-appropriate resources with the involvement of the specific target group. This Community-Based Participatory Research approach is what makes the current study novel and an interesting addition to the current literature.

5.4 Limitations of Research

As with any research project, there were limitations to the current study. The most obvious limitation is the small sample size used with 28 and 20 participants involved in phase 1 and phase 3 of the study, respectively. These women were not sampled randomly, thus giving a biased sample as these they may be more keen and interested in issues regarding their health. Additionally, there is limited generalizability as the target population was very specific, Chinese-Canadian women of childbearing age with children between the ages of 0 to 6 years, who consume two meals of fish a week.
Women were also only recruited from the Toronto Public Health Peer Nutrition Program and University of Guelph, which further limits the external validity of the study.

A language barrier was also of concern, although there was a discussion group moderator who was fluent in Mandarin, the primary student researcher was not. This resulted in the inability of the student researcher to prompt for more discussion and questions during the small discussion groups. The moderator however, was also a graduate student who had a good understanding of the purpose of the discussion groups and prompted discussion quite well throughout the interview process. In addition, the language barrier created more obstacles while editing the videos, since all the audio voice overs were in Mandarin.

In addition, the participants had already participated in the Peer Nutrition Program where they discuss similar issues, so these women may already know of certain risks and benefits associated with consuming fish during pregnancy.

Lastly, the student researcher was responsible for filming and editing videos and had adequate skills to do so, however videos were not created “professionally” although the help and opinions of a professional were sought.

5.5 Implications for Practice

The current research illustrates the importance of using a community-based participatory research approach when developing resources, especially for a culturally-specific or “at risk” population. Health resources should be developed with this bottom-up approach in mind, as it involves the population of interest, which may result in individuals who are more likely to make changes if they see that resources are made with
their particular concerns and interests (O’Fallon and Dearry, 2002). The challenges of this approach include adequate funding to develop resources and having time to build and maintain relationships with specific communities or populations, especially for a Master’s thesis project. However, the benefits of CBPR, including a greater relevance and applicability of resources to help reduce health disparities, are well worth the consideration of using this method to develop resources.

5.6 Implications for Future Research

Suggestions for future research include conducting an in-depth, formal outcome evaluation to identify the impact of using CBPR and educational videos on knowledge and behaviour change amongst the women who were exposed to the videos.

In addition, interviews should be conducted with program leaders in the Toronto Public Health Peer Nutrition Programs, to determine the feasibility of using the videos as an educational tool for the program.
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Appendix A: Recruitment Poster

We want your opinion!

Researchers at the University of Guelph are looking for participants to give their opinion on a series of short videos

We are looking for participants who:

1. Are Chinese-Canadian women
2. Are pregnant OR breastfeeding OR of childbearing age OR have a child between the age of 0 and 6 years old
3. Eat at least two meals of fish per week

We only require one (1) hour of your time. If you are interested, please e-mail kli@uoguelph.ca or call 519-824-4120 ext 54479 for more information.

A $25 gift certificate will be given to all participants

Contact Information:

Judy Sheeshka, PhD, RD
Family Relations and Applied Nutrition
University of Guelph
519-824-4120 ext 54479
jsheeshk@uoguelph.ca

Kwan Yu Li, BASc, MSc student
Family Relations and Applied Nutrition
University of Guelph
kli@uoguelph.ca

This project has received approval from the University of Guelph Research Ethics Board # 105E047
我们想要知道您的意见！

贵湖大学的研究人员需要您的参与，希望知道您们对一些短片的看法。

参与者需符合以下条件:
1. 在加拿大的中国女性
2. 是育龄年龄或者正在母乳喂养或者有零岁到六岁的孩子
3. 每周至少食用两次鱼

我们需要您一个小时的时间。如果您对这个学术研究感兴趣的话，请发邮件至 kli@uoguelph.ca 或者打电话至 519-824-4120 转 54479 获得更多消息。

为感谢您的参与，所有参加人员将获得 $25 的礼卷

联系方式:

Judy Sheeshka, PhD, RD  
家庭关系及应用营养  
贵湖大学  
519-824-4120 转 54479  
jsheeshk@uoguelph.ca

Kwan Yu Li, BASc, MSc student  
家庭关系及应用营养  
贵湖大学  
kli@uoguelph.ca

这个项目已经通过了贵湖大学研究伦理委员会的批准# 10SE047
Appendix B: Consent Form

UNIVERSITY OF GUELPH

CONSENT TO PARTICIPATE IN RESEARCH

Using videos to communicate the risks and benefits of consuming fish to a Chinese-Canadian community.

You are asked to participate in a research study conducted by Judy Sheeshka, Ph.D., R.D. and Kwan Yu Li MSc student, BASc, from the Department of Family Relations and Applied Nutrition at the University of Guelph. Results of the project will contribute to a Master of Science thesis project conducted by Kwan Yu Li.

If you have any questions or concerns about the research, please feel free to contact Judy Sheeshka, Ph.D., R.D., Associate Professor, Department of Family Relations and Applied Nutrition, University of Guelph, 519-824-4120, ext. 54479, jsheeshk@uoguelph.ca.

PURPOSE OF THE STUDY

Purpose of the research study is to develop 2 to 3 short videos educating pregnant Chinese-Canadian women on issues including, but not limited to: general information regarding mercury and fish, Health Canada recommendations and current advisories, benefits and risks of consuming fish during pregnancy for both the mother and the child, issues regarding mislabeled fish in supermarkets and different methods to help minimize consumption of contaminants in fish.

The objective of the research study is to evaluate the videos created and determine if the content is suitable for our Chinese-Canadian population in the Toronto area.

PROCEDURES

If you volunteer to participate in this study, we would ask you to do the following things:

Listen to a 10 minute presentation describing the purpose, objectives and research questions for the study.

Participate in an audio-recorded, small group interview consisting of 6-8 Chinese-Canadian women. In this interview, we are looking for your opinion on
what type of information, graphics, presentation style you would like to see in the
videos. The interview will take place in the Guelph area, to minimize travel and
any inconvenience for you. Interviews will be 0.5 to 1 hour long.

POTENTIAL RISKS AND DISCOMFORTS

You will be asked to talk about your opinions and ideas that you would like to see
incorporated in the videos. You may feel embarrassed to speak about your
opinions in front of others.

POTENTIAL BENEFITS TO PARTICIPANTS AND/OR TO SOCIETY

Participants will potentially get to see their ideas being incorporated into the
videos that are being developed.

PAYMENT FOR PARTICIPATION

Participants will be given a $25 gift card to Walmart as compensation for their
time.

CONFIDENTIALITY

Every effort will be made to ensure confidentiality of any identifying information that is
obtained in connection with this study.

You will be assigned a number and will be identified as that number throughout
the audio-recorded interview session and in written transcripts. No one will be
identified by name or by any characteristics. Names will not be reported in the
data; however since you will be participating in a group interview, researchers
cannot promise complete confidentiality.

Only the research team (Judy Sheeshka and Kwan Yu Li) will have access to
your number codes and demographic information.

Demographic questionnaires, audio-recorded interviews and transcripts of all
data will be kept on one computer locked by a password. Only the research team
will have access to the password.

PARTICIPATION AND WITHDRAWAL

You can choose whether to be in this study or not. If you volunteer to be in
this study, you may withdraw at any time without consequences of any
kind. You may exercise the option of removing your data from the study.
You may also refuse to answer any questions you don’t want to answer
and still remain in the study. The investigator may withdraw you from this
research if circumstances arise that warrant doing so.
If you choose to withdraw from the research or if you don’t come to the study session, there will be no negative consequences. If you decide not to participate or you participate and then withdraw, this will not affect your participation in the Peer Nutrition Program sessions in any way.

RIGHTS OF RESEARCH PARTICIPANTS

You may withdraw your consent at any time and discontinue participation without penalty. You are not waiving any legal claims, rights or remedies because of your participation in this research study. This study has been reviewed and received ethics clearance through the University of Guelph Research Ethics Board. If you have questions regarding your rights as a research participant, contact:

Director, Research Ethics
University of Guelph
437 University Centre
Guelph, ON N1G 2W1
Telephone: (519) 824-4120, ext. 56606
E-mail: sauld@uoguelph.ca
Fax: (519) 821-5236

SIGNATURE OF RESEARCH PARTICIPANT

I have read the information provided for the study “Using videos to communicate the risks and benefits of consuming fish to a Chinese-Canadian community” as described herein. My questions have been answered to my satisfaction, and I agree to participate in this study. I have been given a copy of this form.

____________________________________
Name of Participant (please print)

____________________________________
Signature of Participant

____________________________________
Date

SIGNATURE OF WITNESS

____________________________________
Name of Witness (please print)

____________________________________
Signature of Witness

____________________________________
Date
同意书

使用短片来向加拿大华人社区传达食用鱼的益处和风险

您被邀请参加由贵湖大学家庭关系和应用营养部门的Judy Sheeshka博士及注册营养师Kwan Yu Li研究生进行的学术研究。这个项目的结果将会被用于Kwan Yu Li的科学硕士的论文项目中。

如果您对这个学术研究有任何问题或疑问，可随时联系贵湖大学家庭关系和应用营养部门的Judy Sheeshka博士及注册营养师，519-824-4120，转54479，jsheeshk@uoguelph.ca

学术研究的目的

这个学术研究的目的是制作2到3部短片来教怀孕的加拿大华人了解以下问题：鱼和汞的大致信息，加拿大卫生部的最新和最新的情况通知，在怀孕期间食用鱼对母亲和孩子的益处及风险，在超市销售的没有正确标签的鱼，及使用不同的方法来减少食用鱼中的污染物。

这个学术研究的目标是来评估所拍摄的短片及为这些短片的内容是否适合我们加拿大多伦多地区的华人。

步骤

如果您志愿参与这个学术研究，我们将会要求您做以下的事情：
- 聆听10分钟关于研究的目的，目标，研究问题的阐述。

您会被邀请参加一个将会被录音的由6到8位加拿大华人妇女所组成的团队讨论。在此次交谈中，我们想要知道您对这些短片的信息，图片，表现的方式有什么看法。时间将会是30分钟到一个小时。

有可能的风险及不适

您会被邀请就您对这个短片的形成的看法及意见。您或许对在别人面前表达您的观点感到尴尬。

参与者或社会从中得到的益处

您将会看到您的意见被采纳在这个短片中。

参与的报酬

为了谢谢您的时间，您将会收到价值$25的Walmart的礼卷。

保密性
我们会尽我们的努力来确保与这项研究项目有关的个人信息的保密性。

我们会为每个参与者编码。在访谈的整理过程中（其中包括录音和记录），您的名字将由这个代码取代，以保证您真实参加项目中的保密程度。在数据中人名不会被记录，但是如果您参与我们访谈，我们没有办法完全保证您的保密性。

只有学术研究团队（Judy Sheeshka 和 Kwan Yu Li）的人能够进入您的数字代码和个人问卷的信息。所有信息，包括数据记录将会被保存在带密码的文件里。只有研究团队才有文件的密码。

参与和退出

您有权选择是否参与这个学术研究。即使您不同意参与，您也可以随时退出，不会带来任何后果。您也可以要求您的数据从这个研究中消除。如果您不同意回答任何不想回答的问题，您可以删除在访谈中，如在特殊需要的情况下，可能获取您的数据。

如果您选择中途退出此次学术研究，或者不参与到其中，都不会有任何影响。

如果您决定从这个研究中退出，而您的面试已经被记录，您的匿名将会被研究人员使用。如果您决定从这个研究中退出，而您的面试还没有被记录，那么您的评论也不会被使用。

参与者权利

您可以任何时候退出或停止参与，这不会导致任何的处罚。您也不会因为参与这个研究而给予任何的法律赔偿。这个学术研究已经通过了贵湖大学研究伦理委员会的批准。

如果您对自己作为参与者的权利有任何问题，请联系研究伦理审查委员会。

Director, Research Ethics              电话 (519) 824-4120, ext. 56606
University of Guelph                  邮箱 sauld@uoguelph.ca
437 University Centre                传真 (519) 821-5236
Guelph, ON N1G 2W1

参与者签名

我已经阅读了以上关于"使用短片来对加拿大华人社区传达食用鱼的益处和风险"的信息。我的问题已经被回答了，我同意参加这个学术研究。我也得到了这个表格的一份复印件。

____________________________________
参与者的名字 (请用英文拼音)
参与者的签名

见证人的签名

见证人的名字（请用英文拼音）

见证人的签名

日期
Appendix C: Demographic Questionnaire

DEMOGRAPHIC QUESTIONNAIRE
Using videos to communicate the risks and benefits of consuming fish to a Chinese-Canadian community

Thank you for participating in our study! Before we begin, we would like to ask you a few questions. Please feel free to ask any questions you may have.

1) Please identify your age: _______ years old

2) Identify the region of your birth.

- North China (Hebei, Shanxi, etc)
- Northeast China (Helongjiang, Liaoning, etc)
- Northwest China (Qinghai, Gansu, etc)
- East China (Fujian, Shandong, Jiangxi, etc)
- South Central China (Guangdong, Henan, Hubei, etc)
- Southwest China (Sichuan, Guizhou, Yunnan, etc)
- Hong Kong
- Thailand
- Philippines
- Macau
- Laos
- Malaysia
- Taiwan
- Vietnam
- Singapore
- Cambodia
- Indonesia
- Other (please specify) ______________________________________

3) How many years have you lived in Canada?

- Less than 1 year
- More than 1 year to 5 years
- More than 5 years to 10 years
- More than 10 years to 15 years
- More than 15 years or I was born in Canada

4) On average, how many meals of fish do you eat in a week?

- Less than 1 time per week
- 1 time per week
- 2 times per week
- 3 times per week
- More than 3 times per week

5) Is there anyone in your household that fishes?

- Yes (Their relation to you)________________________
- No
个人信息问卷表
使用短片来对加拿大华人社区传达食用鱼的益处和风险

谢谢您参与这个学术研究！在开始之前，我们需要请您回答几个问题。如果您有任何问题，请随时提出来。

1) 请确认您的年龄   _______ 岁

2) 请确认您的出生地
   □ 中国北方 (河北，陕西，等)
   □ 中国东北 (黑龙江，辽宁，等)
   □ 中国西北 (青海，甘肃，等)
   □ 中国东方 (福建，山东，江西，等)
   □ 中国南方 (广东，河南，湖北，等)
   □ 中国西南 (四川，广州，云南，等)
   □ 香港
   □ 澳门
   □ 台湾
   □ 柬埔寨
   □ 马来西亚
   □ 菲律宾
   □ 越南
   □ 老挝
   □ 新加坡
   □ 印度尼西亚
   □ 其他地方（请指明）______________________________

3) 您在加拿大已经居住多长时间了？
   □ 少于一年
   □ 1-5 年
   □ 5-10 年
   □ 10-15 年
   □ 多于 15 年或者我是在加拿大出生的

4) 您平均每周食用多少次鱼？
   □ 每周少于一次
   □ 每周一次
   □ 每周两次
   □ 每周三次
   □ 每周多于三次

5) 在您的家中，是否有人自己钓鱼？
   □ 有  （他/她与您的关系是）______________________
   □ 没有
Appendix D: Video Questionnaire - Part A

Questions on Video 1

Do you know of any benefits of consuming fish during pregnancy?

Are there any risks of consuming fish during pregnancy, if so, what are these risks?

Where does mercury accumulate in fish?

Where do polychlorinated biphenyls (PCB) accumulate in fish?

When cooking fish, do you know of any ways where we can minimize our mercury consumption?

Questions on Video 2

When cooking fish, do you know of any ways where we can minimize our PCB consumption?

When shopping for fish, what can you do to choose fish with less contaminants (mercury and PCB)?
Questions on Video 1

您知道怀孕期间吃鱼类有哪些益处吗？

怀孕期间吃鱼类有没有风险？如果有，是哪些呢？

汞在鱼类的哪里积聚？

多氯联苯在鱼类的哪里积聚？

在烹饪鱼类的时候，您知道有哪些方法可以将汞的吸收降到最低？

Questions on Video 2

在烹饪鱼类的时候，您知道有哪些方法可以将多氯联苯的吸收降到最低？

在购买鱼类的时候，您可以用哪些方法选择带有少的污染物（汞和PCB）的鱼类？
Appendix E: Video Questionnaire - Part B

VIDEO SURVEY

In a previous discussion group, Chinese-Canadian women had outlined the following to be important for them to be incorporated into the video.

- Risk and benefits for the mother
- Risk and benefits for the child
- Fish consumption recommendations (portion sizes)
- Healthier ways to cook fish
- Fresh versus frozen fish and the mercury level in fish
- What is mercury
- Deep sea versus shallow water fish
- Tips for buying fish
- Nutritional content of fish
- Comparing fish to other types of meat

How well did we incorporate the above topics/suggestions into the videos?

Please circle one:

- Excellent
- Good
- Fair
- Poor

What did you enjoy most about the video?

What did you enjoy the least?

Your opinion matters to us! Please let us know what we can do to improve on or change about our videos.
VIDEO SURVEY

在上一次的讨论小组中，加拿大华裔妇女取得了以下重要的几点被纳入到视频中：

- 对妈妈的风险和收益
- 对孩子的风险和收益
- 一餐吃多少鱼类的建议
- 健康做鱼的方法
- 新鲜鱼与冷冻鱼和鱼的汞含量
- 什么是汞（水银）?
- 海鱼和淡水鱼
- 买鱼类的一些注意事项和提示
- 鱼类的营养价值
- 鱼类与其他肉类的比较

我们对以上述议题建议纳人视频的怎样？

请选择一项：

Excellent (非常好)  Good (好)  Fair (一般)  Poor (差)

您最喜欢视频的哪些地方？

您最不喜欢的是哪些地方？

您的意见对我们很重要！请让我们知道我们能做些什么可以改善或改变我们的视频。
**Appendix F: Script and Storyboard**

<table>
<thead>
<tr>
<th>Narration</th>
<th>Description of Visual</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A:</strong> Storyline: Jane Doe is a 32 year old woman and is pregnant for the first time, she and her husband are very excited! They live in Toronto, Ontario and enjoy spending time with family and friends. They love to cook together and both really enjoy seafood, in particular fish. They had heard some things about fish and pregnancy and decided to go to their doctor/RD to get more information. 32岁的Jane Doe和她的先生目前住在安大略省的多伦多。他们俩人都非常喜爱烹饪，特别喜欢海鲜，尤其是鱼。他们平时喜欢邀请家人和朋友一起共享美食。最近得知Jane怀孕的消息，为此他们感到非常的兴奋。兴奋之余又不免为在怀孕期间食用过多的鱼是否会对胎儿有影响有些担忧，于是决定向他们的医生咨询更多的信息。</td>
<td>Show happy Asian couple, wife is pregnant, husband standing by her side – couples that our target audience can relate too. Toronto backdrop to symbolize that they live in the same environment as our target audience.</td>
</tr>
<tr>
<td><strong>B</strong></td>
<td>Have a picture of a fish, beef, pork and chicken and show on a scale that fish has lower amounts of cholesterol than these and have the words “quality protein” pop up on top of the fish in a starburst.</td>
</tr>
<tr>
<td>Doctor: Fish is a very good quality protein and has lower amounts of cholesterol and saturated fat than beef pork or chicken. 医生：鱼是一种高蛋白，低胆固醇和低饱和酸的食物。它们的胆固醇和饱和酸的含量低于牛肉，猪肉或鸡肉。</td>
<td></td>
</tr>
<tr>
<td><strong>C</strong></td>
<td>Zoom in on the picture of the fish, and have these nutrients pop up on the fish, symbolizing that fish contain these nutrients.</td>
</tr>
<tr>
<td>Doctor: Fish is an excellent source of: niacin, selenium, vitamin B12, vitamin A, D, Ca, Zn and Iron which is important for women who are pregnant! 医生：鱼富含烟碱酸，硒，维他命B12，维他命A,维他命D，锌，钙，和铁，其中铁元素对怀孕中的妇女尤其重要。</td>
<td></td>
</tr>
<tr>
<td><strong>D</strong></td>
<td>Fade the nutrients out and have words omega 3 and omega 6 appear on the fish and have them radiate to symbolize that they are important and can have beneficial effects.</td>
</tr>
<tr>
<td>Doctor: Not only can fish provide you with a lot of nutrition, but it also contains heart healthy fats, such as omega 3 and omega 6 which have beneficial effects for your health and your baby. 医生：鱼不仅可以提供你很多营养，它还含有心脏健康的脂肪，如ω3和ω6，它们对你的健康和宝宝有益。</td>
<td></td>
</tr>
</tbody>
</table>
**Doctor:**
There are many benefits of fish consumption.

General Benefits of fish consumption are reduced risk of coronary heart disease and better heart health.

Benefits for you (as a mother!) are: reduced risk of high blood pressure and other problems during pregnancy, the baby being born too early and depression after the baby is born.

Benefits for your baby include: visual benefits and also benefits for their brain development. Your baby needs omega 3 fats for the proper development of the brain and eyes.

**Jane Doe:** How can my baby get these beneficial effects?

**Doctor:** This depends on your intake of fish during pregnancy and also after pregnancy since breast milk also is a natural source of omega 3’s.

**Jane Doe:** 那请问我的婴儿如何才能得到这些益处呢？

**Doctor:** 这取决于你在怀孕期间鱼的摄入量。和产后的母乳喂养状况。因为母乳富含omega 3。
<table>
<thead>
<tr>
<th>Jane Doe’s husband: I heard that fish may contain something called Mercury?</th>
<th>Zoom in on Husband’s face asking question with narration on top and speech bubble in Chinese</th>
</tr>
</thead>
<tbody>
<tr>
<td>丈夫：我听说鱼可能会含有一样叫汞的东西？</td>
<td>Image of Jane Doe and husband in doctors office. Doctor starts to explain what Mercury is…(narration over top of acting).</td>
</tr>
<tr>
<td>Doctor: Mercury is a natural occurring element and can be found in the air, water and soil. Mercury can be man-made or found in natural sources such as volcanic eruptions, forest fires.</td>
<td>Have a picture of landscape, with a water, forest and rain.</td>
</tr>
<tr>
<td>Mercury falls into our lakes and waters, from rain, and is converted into Methylmercury, which can be harmful, if consumed in large quantities.</td>
<td>Have the rain fall into the lake, have something in rain to symbolize Methylmercury falling into the lake.</td>
</tr>
<tr>
<td>Fish accumulate Methylmercury by eating plants that have absorbed this mercury or by eating smaller fish than have consumed plants that have absorbed mercury.</td>
<td>Zoom in on the lake now, and show mercury being absorbed into the algae/plants and have little fish eating this mercury and accumulating MeHg and the bigger fish eating the little fish and accumulating more.</td>
</tr>
<tr>
<td><em>Use some sort of picture to symbolize mercury</em></td>
<td></td>
</tr>
<tr>
<td>Doctor: Methylmercury binds to the protein (or the meat) in fish, therefore there is little we can do to get rid of it. Other contaminants, such as persistent organic pollutants (or PCBs) are located in the fat and organs of the fish, so you may want to limit the amount of fish skin, fish belly and organs that you eat.</td>
<td>Have mercury in center and have arrows pointing out from it indicating some of the risks. Have words that say…“when consumed in large quantities”</td>
</tr>
<tr>
<td>When consumed in large amounts, Methylmercury can have some negative effects on your body such as: blurred</td>
<td>Do same for risks for baby.</td>
</tr>
</tbody>
</table>
vision, hearing impairment, clumsiness of hands, difficulty articulating words, numbness and tingling of extremities.

There can be some negative effects for your baby as well, when Methylmercury is consumed in large quantities such as disturbances in mental and motor development, difficulty in chewing, swallowing, speech and coordination.

Even though there are some risks of consuming fish during pregnancy, this occurs when too much fish is consumed.

This is why Health Canada has come out with recommendations on fish consumption for women who are pregnant, may become pregnant or are breastfeeding.

They recommend that these women eat 150 g (or 2 cups) of fish a month. Specific fish that you should limit while pregnant are fresh/frozen tuna, shark meat, sword fish, marlin, orange roughy and snake mackerel. Other fish have less risks.

Have picture of pregnant women in background, woman holding child and woman breastfeeding and have visuals of what 150 g of fish looks like or 2 cups of fish.

Have in words 150 g or 2 cups under the visuals per month.
加拿大多卫生部建议这些女性一个月最多食用150克（或2杯）鱼肉。在怀孕期间避免食用的一些鱼包括新鲜或冷冻的金枪鱼，鲨鱼，剑鱼，枪鱼，新西兰红鱼和鲭鱼。除此之外的其他鱼类毒性要小一些。

This is not to say that you cannot enjoy fish with your family and friends, we must remember all the benefits of fish that we mentioned before, reduced risk of high blood pressure during pregnancy, having your baby born too early and depression after birth, visual benefits and also benefits for their brain development.

Not to mention fish is a great source of protein and has many nutritional benefits too! If you are pregnant, may become pregnant or are breastfeeding, you just need to watch the amount of fish that you consume a month!

Now let’s go the supermarket and we’ll show you some tips on how to shop to minimize the risks of Methylmercury!

这并不是说你不能和你的朋友还有家庭享用鱼，我们必须要记住，之前提到的食用鱼的所有益处：如减轻怀孕期间高血压的风险，减低早产的概率和产后抑郁症。以及对婴儿视觉和大脑发育的好处。

更值得一提的是鱼富含蛋白质以及其他的营养成分。

如果你将要怀孕，已怀孕或正在母乳喂养中，只需注意每个月鱼的摄入量即可。

现在让我们去超级市场，我们会告诉你一些关于如何选购食用安全的鱼类的方法。

| Have visual of Jane Doe with husband preparing to make dinner…have benefits pop up on screen to remind women that there are many benefits. |
| Phase words out… |

| This is not to say that you cannot enjoy fish with your family and friends, we must remember all the benefits of fish that we mentioned before, reduced risk of high blood pressure during pregnancy, having your baby born too early and depression after birth, visual benefits and also benefits for their brain development. |
| Not to mention fish is a great source of protein and has many nutritional benefits too! If you are pregnant, may become pregnant or are breastfeeding, you just need to watch the amount of fish that you consume a month! |
| Now let’s go the supermarket and we’ll show you some tips on how to shop to minimize the risks of Methylmercury! |
When shopping for fish, you want to be mindful of the fish which are bigger in size. Since mercury is in the water that fish live in, the ones that live longer and are bigger tend to accumulate more mercury in their body.

You also want to choose a wide variety of fish, to avoid eating a lot of one type of fish which may have high levels of contaminants.

(show list of fish that they commonly consume and identify mercury levels using a barometer) (show chinese and English names)

K

当购买鱼的时候，你需要特别小心那些体积大的鱼。因为水银存在于鱼生活的水中，那些大的鱼一般都活的更久也更容易累积更多的汞在体内。也需要选择不同品种的鱼，避免过多食用高污染的同一个品种的鱼。

When cooking these fish, here are some tips on how to minimize the consumption of contaminants:

1. Use methods such as grilling, broiling and baking more often, so that the fat drips away from the fish – not only do these methods help lower your consumption of contaminants, but they are also healthier ways to cook fish!
2. If you do fry your fish, try not to reuse the oil.
3. Do not eat the fish organs since these are high in mercury and pesticides
4. Since other contaminants, other than mercury are stored in the fat, limit your consumption of fish skin and the fish belly.

Enter grocery store, have camera on grocery cart, navigating way through store towards fish department.
Show different fish and the sizes, bring up point that bigger accumulate more mercury in body.

Scan fish the other way and bring up point about variety.

1. Grill, broil, bake fish – have pictures pop up of each method (fade previous point into background and next point pops up…do this for every point)
2. If you fry fish, do not reuse oil
3. Try to avoid eating fish organs (show pictures of fish organs with red cross through them)
4. Limit intake of fish skin and belly (show picture of fish with arrow pointing to belly)
5. Try to avoid eating fish roe/eggs (show picture of fish roe)
5. Do not eat fish eggs or roe since these are high in fat and some contaminants are stored in fat (PCB)

以下是一些烹饪鱼的时候如何减少食用污染物的方法：

1. 尽量使用烧烤，煮，和烤的方法，脂肪会从鱼中排出。这些方法不仅可以减少污染物的摄取，而且更是烹饪鱼的健康方法。

2. 如果你要煎鱼的话，不要重复使用用过的油。

3. 因为鱼的器官有很多的汞和杀毒剂，所以不要食用器官。

4. 除了汞之外的其它污染物是储藏在脂肪里的，所以减少使用鱼皮和鱼肚子。

5. 不要使用鱼子或者鱼泡，因为这些东西含有高脂肪而且很多污染物是储藏在脂肪里的。

Sometimes when fresh fish is not available, frozen or canned fish can be used as good alternatives.

There is not much of a difference in the nutritional quality between fresh, frozen and canned fish.

Fatty acids in canned fish lost slower than frozen and some vitamins are lost to the fluid that the fish is packed in.

However, the nutritional quality of canned fish is very good.

Frozen fish can be stored from 6 months to 1 year without degradation of omega-3’s. So this all depends on your taste preference!

Show three different panels, one of fresh fish at the grocery store, one of frozen and one of canned. Indicate that they are all good sources by putting green check marks on top.

Place words on frozen fish “panel”:
- Can be stored from 6 months to 1 year.
的差别不是很大。在罐头鱼肉中的脂肪酸的流失速度要比冷冻鱼肉慢，一些维他命会流失在包装鱼罐头中的汁里。但是总体而言罐头鱼的营养价值是很高的。冷冻的鱼可以储藏6个月至1年之久，在此期间omega 3不会降解。选择哪一种食用鱼的方式取决于你个人的口味。

<table>
<thead>
<tr>
<th>When choosing canned fish, follow these tips to help minimize your consumption of contaminants:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Choose “light” more often. Look at the ingredients and choose “skipjack, yellow fin and tongol” tuna more often since it is a smaller fish and contains less amount of mercury.</td>
</tr>
</tbody>
</table>

Canned tuna contains less mercury than fresh or frozen since they tend to use smaller fish to make canned tuna.

N当选择罐头鱼的时候，可以参考以下意见来减少污染物的摄取。尽可能选择易消化的罐头鱼，看材料的时候尽可能多选择鲔wei鱼，黄鳍qi金枪鱼，金枪鱼，因为这些是小Tuna鱼，含有少量的汞。罐头的金枪鱼较之新鲜或者冷冻的金枪鱼含更少的汞，因为小金枪鱼往往被用来做罐头。

<table>
<thead>
<tr>
<th>So let’s review the tips on how to shop for fish to help reduce our consumption of contaminants:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Eat a wide variety of fish!</td>
</tr>
<tr>
<td>2. Choose fish that are smaller in size (since these tend to accumulate less contaminants)</td>
</tr>
<tr>
<td>3. Grill, bake or broil your fish! Avoid reusing oil that you have fried you fish in</td>
</tr>
<tr>
<td>4. Avoid consuming fatty parts of fish</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Place words on canned fish “panel”:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Look for these words! “Light”, You want to choose “skipjack, yellow fin, tongol”</td>
</tr>
</tbody>
</table>

Faded grocery store in the background: Have points brought up on screen.
(since some contaminants are attracted to the fat in fish) such as fish eggs/roe, fish belly and fish skin
5. Frozen and canned fish are good healthy alternative to fresh fish!
6. For canned fish, remember to choose “light” fish more often and also these kinds “skipjack, yellow fin and tongol”

O

让我们来回顾关于如何购买低污染的鱼的小窍门：
1. 选择不同种类的鱼。
2. 选择体型小的鱼（这些鱼会有更少的污染物）
3. 尽量多使用烧烤，煮，或者烤的烹饪方式。避免重复使用已用过的油。
4. 避免食用鱼的脂肪部分比如鱼子，鱼泡，鱼肚子和鱼皮。
5. 就营养而上，冰冻和罐头鱼是新鲜鱼的替代品。

6. 在选择罐头鱼的时候，请选择易消化的鱼，这些包括鲔鱼，黄鳍金枪鱼，和金枪鱼。
Appendix G: Educational Videos

Link to Video 1:

http://dl.dropbox.com/u/38395952/Video1.mp4

Link to Video 2:

http://dl.dropbox.com/u/38395952/Video2.mp4