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Chinese parents' knowledge and use of vehicle restraint for their children.

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CHINESE PARENTS' KNOWLEDGE AND USE OF VEHICLE RESTRAINT FOR THEIR CHILDREN

by

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ABSTRACT

Motor vehicle crashes are the leading cause of childhood death and disability in China. The majority of these motor vehicle injuries are the result of improper driving behaviour, such as not wearing seat belts or not using child restraints. A survey design was used to examine Chinese parental knowledge and perceptions of use of safety systems for children. 872 Chinese parents in China and 96 in Canada participated in this study by completing a self-report questionnaire. Data analysis revealed that non-use rate of restraints for children is high in China. Among those who reported use safety systems for children, only 20% of children are using correctly in China. Both groups have low use rate of booster seats. In addition, the results revealed that parents in both groups frequently use non-professional sources for vehicle safety information. The results from this study will provide the foundation for child restraint education in the Chinese population in order to help develop effective safety policies and regulations in China. It will also help Canadian health professionals provide effective cultural sensitive health education about children vehicle safety to new Chinese immigrants living in Canada.

DEDICATION

To my husband, Bing who has supported me throughout the two years of my master study. I could not finish it without him. To my parents, who have patiently understood that my need to pursue my career goal. To my baby girl, who will be born in August.

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CHAPTER I

INTRODUCTION

Problem Statement

The introduction of motor vehicles around the world has offered many positive lifestyle changes, but has also presented negative consequences, such as motor vehicle related injuries and deaths. Many people die or are injured every day all over the world due to traffic collisions. Numerous injuries are caused from improper driving behaviors, such as not wearing a seatbelt or not using child restraints. Motor vehicle collisions are one of the leading causes of death and injury among infants and children in Canada (Howard, 2002).

Approximately 1.2 million people die every year as a result of road crashes and 20 percent of those deaths occur in China (Kapp, 2003). In addition, motor vehicle accidents are the leading cause of childhood and adolescent death and disability in China. Even if child restraints are in use, they may be incorrectly installed or children may not be properly seated in them, often leading to severe injury or death. Death and disability of children involved in motor vehicle accidents can be prevented. It is estimated that correctly used child safety seats reduce the risk of fatality by 71 percent and the risk of serious injury by 67 percent in passenger cars (Lapidus et al., 2005). However, currently there are no statistics available in China related to how many children die or are injured in car accidents due to improper placement of child restraints.

One major issue is that there is limited research concerning parental knowledge of child restraints in the Chinese population. As more Chinese parents purchase cars, vehicle safety is becoming a major public health issue and is expected to escalate as this

trend continues. This study may be foundational to fully understanding the impact of child safety in the Chinese population. In addition, this study will inform Canadian nurses of vehicle safety practice of Chinese families immigrated to Canada. The results of this study are anticipated to support the development of effective interventions for new Chinese immigrants to Canada, as well as inform relevant safety policies and regulations in China.

Study Purpose

China is the fastest-growing vehicle sales market in the world, and is expected to grow dramatically over time. According to the Socioeconomic Data and Applications Center (*SEDAC*) of the Center for International Earth Science Information Network (*CIESIN*), in the next 20 years, the annual automotive production output of China will reach 6 million, and the number of automobiles in use will increase to 50 million. However, both China's automotive industry and the public awareness of vehicle safety are in its infancy. Road safety programs have not been well developed to date and will play an important role in helping to reduce crashes as vehicles become more abundant on China's roads.

In order to encourage politicians and policy makers to support such activities, it is necessary to inform them of the "true" size of the road safety problem and provide convincing evidence about the social and economic cost of road crashes.

There is no single blueprint for road safety. Interventions and strategies that work in one setting may not be suitable in other cultures and ethic groups.

This study will be a first step to promoting and enforcing relevant safety policy and regulation in China. It may also provide more valuable in-depth information about

children's safety in vehicles in China. In addition, this study will be the first of its kind to inform Canadian health professionals of the health promotion needs regarding vehicle safety for Chinese families living in Canada. The ability to provide culturally relevant health care to clients, such as parents' education about child road safety, remains a challenge for the Canadian health care system. The survey will provide insights into Chinese parents' knowledge of child vehicle safety. It will help health professionals here in Canada to provide culturally sensitive health education to Chinese immigrants.

The purpose of this study is to examine parents' knowledge and car safety seat use among Chinese families and compare knowledge and use in families with new Chinese immigrants to Canada.

The research questions are:

1. What is the knowledge and use of car safety seats among Chinese parents living in China?

2. What is the knowledge and use of car safety seats among Chinese immigrant families in Canada?

3. What is the difference in knowledge and use of child safety seats among Chinese and Chinese immigrants in Canada?

4. What are the predictors of parents' knowledge and use of child safety restraints in Canada and China?

CHAPTER II

REVIEW OF LITERATURE

Background

Every day thousands of people are killed and injured on our roads. Millions of people each year will spend long weeks in hospital after severe crashes and many will never be able to live, work or play as they used to. The World Organization (WHO, 2004) suggests that the estimated number of road deaths is approximately 1.18 million annually, which "represents over 3000 lives lost daily (p.4). The road traffic death toll represents only the "tip of the iceberg" of the loss of human and social resources due to road injuries. WHO estimates that, worldwide, between 20 million and 50 million people are injured or disabled each year in road traffic crashes (WHO, 2004).

Traditionally, road safety has been assumed to be the responsibility of the transport sector, and public health has been slow to become involved. But the health sector would greatly benefit from better road traffic injury prevention in terms of fewer hospital admissions and reduced severity of injuries (WHO, 2004).

The World Health Organization (WHO) deemed road safety as a major public health issue in 2004. The report identified the importance of prevention of road traffic injuries. This is the first WHO report of road safety in over forty years. Motor-vehicle safety is deemed as the second of the ten great public health achievements in twenty century in the United States by the U.S. Centers for Disease Control and Prevention (CDC) (CDC, 2003).

Road safety is a multisectoral issue and a public health issue. All sectors, including health, need to be fully engaged in activity and advocacy for road crash injury

prevention. The public health approach to road traffic injury, which is described by World Health Organization (WHO) (2004, p.9), includes injury surveillance, research, prevention and control, evaluation, policy, services, and advocacy. In China, public health includes disease prevention and control, health treatment, environmental health protection, and so on (Ministry of Health, China, 2004). More recently, the Chinese government has paid more attention to public health issues than ever before as a result of the SARS epidemic in 2004.

Globally death and injuries resulting from road traffic crashes are a major and growing public health problem. However, road traffic crashes and injuries are both predictable and preventable. The causes of road traffic injuries are excessive speed; consumption of drugs and alcohol; failure to use protective measures such as seatbelts and helmets; poor vehicle impact protection and poor road design (Giles, L.P. et al., 2005). In many developing counties, such as Ghana and Thailand, an established set of interventions has contributed to significant reductions in the incidence and impact of road traffic injuries (Afukaar F.K, et al., 2003; Yang B. & Kim J., 2003, WHO, 2004). Intense, short duration, high visibility safety seat belt enforcement campaigns, coupled with paid media, have resulted in raising safety belt use in the United States (Binder, S. & Runge, J.W., 2005). Interventions such as child safety seat laws, primary enforcement of seat belt laws, and community-wide information and enforcement campaigns, were found to be highly effective in providing road traffic safety (Zaza, S., et al., 2001).

The World Report on Road Traffic Injury Prevention (2004) also suggests that road crashes and injuries can be effectively prevented through such simple strategies as safety belts for adults and safety seats for children. WHO data shows that the overall

global road traffic injury mortality rate was 19.0 per 100,000 population (WHO, 2004, p. 33). Low- income and middle-income countries had a rate slightly greater than the global average. Ninety percent of road traffic deaths were in low-income and middle-income countries. The rate in low-income countries is 20.2 per 100,000 population, and the rate is 12.6 per 100,000 population (WHO) in high-income countries. The highest rates are found in some Latin American countries, as well as Asia (21.9 per 100,000 in Korea, 21.0 per 100,000 in Thailand and 19.0 per 100,000 in China). Although the number of vehicles is much lower in those countries than high-income countries, the number of road traffic injuries has continued to rise worldwide. It is much different between high-income countries and low-income, middle-income countries. Since 1960s and 1970s, there has been a decrease in numbers and rates of fatalities in high-income countries, such as Canada, Australia, Germany, Sweden, the United States of America, and the United Kingdom. Many highly-motorized countries, in response to rising road trauma levels during the 1960s and early 1970s, achieved large reductions in casualties through outcome-oriented and science-based approaches (WHO, p. 7). The reductions in road traffic fatalities in high-income countries are attributed largely to the implementation of a wide range of road safety measures, including seat-belt use, vehicle crash protection, traffic-calming interventions, and traffic law enforcement (Jacobs, et al., 2000). At the same time, there has been a pronounced rise in numbers and rates in many low-income and middle-income countries (WHO, p.36). The road traffic fatality rate increased 243% from 1975 to 1998 in China (Kopits & Copper, 2003).

Road traffic injuries are a major but neglected global public health problem in China, requiring concerted efforts for effective and sustainable prevention.

Road Fatalities/Injuries in China

The country's booming economy has established China as the world's fastest growing car market (The New York Times, March 12, 2004). In China, the number of vehicles has more than quadrupled from 1990 to 2002, to over 55 million vehicles on China's roadways. The total sales number of new vehicles in China in 2005 was more than 5.72 million (National Statistics of China, 2006). Most vehicles are used in big cities. According to annual reports by National Bureau of Statistics of China (National Statistics of China), by the end of 2005, there were 43.29 million civilian vehicles in China, an increase of 20.6% from 2004; and 23.65 million private cars, an increase of 22.0% over last year.

The number of vehicles in Beijing (the capital of China), is the highest among Chinese cities. According to data from Beijing Statistic Bureau (2006), by the end of 2005, the population of Beijing (the capital of China) was 15.38 million, and there were 1.54 million private vehicles in Beijing, an increase of 18.7% over 2004. The number of private cars in Beijing was 0.992 million, an increase of 23.5% from 2004. Thus, more than 10% of people living in Beijing own private vehicles (National Statistics of China, 2006), and the number of vehicles increases by 1000 every day in Beijing (Beijing transport, 2006).

However, the population in China is more than 1.3 billion. The leading reason for so many people living in China not owning cars is the expensive price. Usually, the price of a car in China is 1.5 times more than that in the international market. However, the average income in China is much lower than other countries such as America, Canada, Japan, and so on. This situation was expected to change when China joined the World

Trade Organization (WTO) in 2002 (Sina, 2003). In 2005, there were more than 45 million people with a driver's license in China. More than 3 million people who lived in Beijing have driver licenses, and the number increases 10% every year. There is at least one family member holding a driver's license in more than half of families living in cities in China (China Statistics, 2005). These people are the main consumers for renting vehicles, and they are most likely to buy vehicles in the future.

The population who owns a car in China is mostly between age 26 and 45 years old. Most of them have jobs, that would be considered very good in Chinese culture, and the annual incomes are more than $8000.00 dollars. With the economic boom of China fuelling an automobile revolution, 14,000 new cars are licensed roads each day. Thus, with this rapid growth of drivers, road fatalities are increasing at an alarming rate (Sina, 2003). According to annual reports from the Ministry of Public Security of the People's Republic of China (Ministry of Public Security of the People's Republic of China, 2006), most collisions in China are caused by drivers who violate traffic rules, which resulted in 92.2 percent of traffic deaths in 2005. Specifically, improper driver behavior includes speeding, drunk driving, and overtaking other vehicles.

Prevalence of Road Traffic Injury in children in China

According to World Health Organization (2004), of the 1.2 million deaths every year on roads around the globe, about 20% take place in China. It is estimated that 680 people are killed each day on the country's highways in China. The problem of road safety is growing worse as the number of vehicles in China skyrockets. Road traffic fatalities in China are predicted to increase to almost half a million per year by 2020 unless urgent action is taken (WHO, 2004). According to the Chinese government, in

2005, the number of road crashes in China was 450,254, with 98,738 people losing their lives and 469,911 suffering severs injuries (National Statistics of China, 2005).

Injury is the second leading cause of childhood and adolescent death and disability in China. A report on child pedestrian safety revealed that Chinese children experience increasing risks of traffic injuries as the number of cars soar, at least 19 children under age of 15 who die in road accidents every day. According to the report jointly conducted by the China Centre for Disease Prevention and Control and the Ministry of Public Security, 7,078 children were killed in traffic accidents, and another 28,017 children were injured in 2004 (Jiefang Daily, 2005, March 14). Another 2004 survey conducted by the ministries of education and public security in 10 localities including Beijing, Shanghai and Tianjin, found that road crashes are killing more than 18,500 children under 14 years old in China each year (China government, 2005).

A new traffic safety law, which took effect in 2004, recommend that traffic safety programmes be integrated into schools' regular agenda. To date, no research appears to have been done that examines the impact of not using safety restraints related crashes on health, social and economic aspects at either the individual or community levels.

Injury Outcomes for children in Other Countries

In many counties, accidental injury is the leading cause of death for children under 14 years old (Safety Kids, 2006). Approximately 1.8 million children are injured in Germany each year due to accidental injury. According to Japan's National Police Agency, only 49% of children are placed in child safety seats in Japan. The fatality rate in traffic accidents in Japan in 2004 for children not in child safety seats was 4.1 times the fatality rate for children who were properly seated. Every day, 37 Korean children under

the age of 14 are killed or injured as pedestrians in road traffic accidents. In Philippines, more than 3,600 children die yearly from accidental injury, and 418,552 children suffered from accidental injuries (Safety Kids).

Roadway accidents were a crisis in the making. The problem of deaths and injury as a result of road crashes is now acknowledged to be a global phenomenon with authorities in virtually all countries of the world concerned about the increasing number of people killed as seriously injured on their roads. A global epidemiological study (WHO, 2004) estimated that the annual number of deaths and disabilities due to traffic collisions would increase by more than 60% if current trends continued. And by 2020, road traffic injuries are expected to be ranked as the third leading contributor to the global burden of disease and injury (WHO).

The leading cause of trauma related hospital admissions in North America is motor vehicle crashes (MVCs). MVCs are the leading cause of death and acquired disability for children older than 1 year of age (Geilen, Erikson, Daltroy, & Rost, K., 1984; Ramsey, Simpson, & Rivara, 2000; Winston & Durbin,1999). Over the past 30 years, childhood trauma from MVCs' has remained unchanged, and 50% of all childhood deaths are attributed to trauma related injuries in North America (Block, Hanson, & Keane, 1998; Patterson, 1999).

Economic Costs of Road Crashes

Beyond the loss of human life, poor road safety has serious economic and social impacts on all nations, and in particular developing countries. The economic cost of road traffic crashes is enormous. Estimates suggest that they cost low income and middle income countries 1% to 1.5% of their gross national product (GNP) and high income

countries 2% of GNP (WHO, 2004, p. 5). A conservative estimate of the global cost has been placed at 518 billion US$ per year with low income and middle income countries accounting for 65 billion US$ – more than they receive in international aid (WHO).

Economic costs are just the tip of the iceberg. For every person killed, injured, or disabled by a road traffic crash, there are countless others deeply affected. Many families are driven deeper into poverty by the expenses of prolonged medical care, loss of a family breadwinner, or the added burden of caring for the disabled (WHO, 2004).

The economic impact has been enormous. In the case of China, annual direct and indirect costs have been estimated at between $12 to 21 billion USD, approximately 1.5% of the China's gross domestic product. The Chinese government has made road safety a priority. It created a 15-ministry committee under the State Council to introduce the first Road Traffic Safety Law in China, which took effect on May 1, 2004. This new nationwide traffic safety law requires all occupants to wear a seat belt when they are driving. However, under this law, every province can choose to have its own criteria for punishment. In most cities, drivers are convicted of driving-related offences if they do not wear a seat belt while driving. The punishment is demerit points recorded on their records and they must pay RMB $50 (approximately CA $8) as a penalty. However, this is not enforced strictly in many cities. This is an important first step. The law, when fully implemented and enforced, has the potential to significantly reduce road traffic injuries (Zhang, 2004).

Improper Driving Behaviours

Road crashes are the second leading cause of death of children in China (WHO, 2004). There is currently no related traffic law in China to protect children's safety in

vehicles. The mortality due to traffic accidents in China is the highest in the world. Many parents in China lack the knowledge of children's safety in vehicles. They may not be aware of the risk children face in the vehicle. According to a survey in a popular website (Sina, 2005), 75.66% parents admitted that they did not use car seats for their children, 39.95% parents place their children in the front seats, 43.12% parents think it is helpful to protect their children by holding the children on their laps, 10.05% drivers believed that the air bags would protect children in the event of crashes.

According to a GM poll conducted earlier in 2003, 48 percent of motorists in Shanghai (China's biggest city) admit that they do not always wear safety belts, despite local laws requiring their use. There are few passengers, especially children who use seat belts or other safety equipment when they seated in vehicles in China.

Families in China

"One family only one child" is a policy by Chinese government. Therefore there is only one child in most Chinese families since the 1980's. It is perceived that since they only have one child, Chinese parents have heightened concerns for the health and safety of their child. The children are thought to be more valuable to Chinese families. Parents would like to give their children everything they want, and Chinese families usually want to give children the best opportunities and resources they can provide. In China, especially in the big cities, most families will purchase cars when they have a baby. However, given there is no law about child restraints in China, there are few to learn about children's safety in vehicles among parents in China.

Vehicle Safety Education Programs in China

Unlike many Western countries, China has no laws requiring the use of child restraints or standards to ensure that safety seats are properly installed in vehicles. There are no specific industrial standards in China to regulate design and production of child safety seats. A Shanghai Daily survey found that few safety seats are available on the local market and few local parents seem to understand the lifesaving qualities of restraint devices. There are no data available on how many children died or were injured in car accidents due to improper use of restraints to encourage parents to learn about vehicle safety.

More and more people in China buy their own cars and vehicle safety has become a major public concern of social responsibility. Vehicle safety education is now gaining momentum across China. In the 2004 traffic safety law, it is required that safety education programs should be developed in schools. Since 2004, more and more safety education programs have been launched in China by government and some organizations.

Volkswagen and Tongji University initiated an accident research project in China in 2005 (Shanghai Volkswagen, 2005). The project aims to increase road safety in China through improved coordination of vehicle manufacture, transport infrastructure and driving behavior. Volkswagen and Tongji University put together a multi-disciplinary team of people from the areas of vehicle design, medicine and psychology for a four month project. Working in close cooperation with the local police, hospitals and transport authorities, teams worked alternate shifts at accident sites collecting and evaluating information on the causes of accident, evidence at the scene, vehicle deformation and the injury outcomes of the accident. The studies not only focused on vehicles and road

conditions but also on the driver and their driving behaviour and the behaviour of other road users, with a view to exploring patterns of driving behaviours, and the possibility of long-term accident conditions and accident outcomes.

Volkswagen also has a Chinese website specially designed for children, which teaches children about children transportation safety. In 1999, Shanghai Johnson & Johnson Pharmaceuticals Ltd. introduced the Safe Kids campaign to China. Similar to Safe Kids Canada, they have activities named "safe kids week" every year. In 2003, the first website about children's safety (http://www.safekidschina.com) in China was launched with sponsor Shanghai Johnson & Johnson Pharmaceuticals Ltd. On April 12, 2005, Safe Kids China launched the "Walk This Way 2005" campaign in Beijing. Volunteers, including 25 FedEx employees, taught 350 students at Chao Yang Shi Yan School about passenger safety. The in-school education on child pedestrian safety reached over 30,000 students in Shanghai, Beijing and Guangzhou. The campaign received support from the China CDC and the Chinese Ministry of Public Security. Guests included representatives from the China CDC, the Chinese Ministry of Public Security, WHO, UNICEF and the U.S. Embassy (Safe Kids China, 2005).

The China Automobile Association (CAA), collaborating with Qinghua University, one of the best universities in China, launched a Road safety campaign. The campaign began in September 2005, and will last at least half a year. The programs have many themes: seat belt and air bag use, speeding, drunk driving, and vehicle safety for children.

In April 2005, the "China Seatbelt intervention" was successfully launched in Beijing and Guangzhou. The China Seatbelt Intervention Project is a co-operative

partnership between the Chinese government, international organizations and industry. The implementation of this project is guided by the members of the Steering Committee which includes the Traffic Administration Bureau of the Ministry of Public Security of China, officials from the Ministry of Health, officials from the Public Security and Traffic Departments of Guangzhou Municipal Government, officials and specialists from the WHO, representatives of the sponsoring company British Petroleum (BP), and the George Institute for International Health. Recognizing the potential of this intervention to significantly reduce deaths and injuries on China's roads, the Chinese government has embraced international best practice in line with existing government policy and highlights the intent of the new road safety law. Adopting successful practices around the world, senior police and traffic officers attended seatbelt law enforcement training and commenced an intensive enforcement program in October 2005, in which almost 3000 vehicles were inspected and 1000 drivers or passengers not wearing their seatbelt were penalized or educated. This best practice approach will assist policy makers to identify how to carry out this type of intervention and demonstrate how to gain the most impact and benefits to Chinese citizens (George Institute, 2005). To complement the intervention, an intensive social marketing campaign was used to focus on raising awareness of road traffic safety laws, according to the Traffic Command and Control Center of Guangzhou Municipal Bureau of Public Security. It is being implemented in collaboration with training managers of taxi companies and members of traffic safety committees. The center reports: "Guangzhou police have indicated that since the launch of the China Seatbelt Intervention, a series of activities including social marketing campaigns, taxi companies' management and enhanced seatbelt enforcement, aimed to

increase seatbelt use awareness and compliance, have been implemented. The 24 month intervention project is due for completion in October 2006. However, there are no published outcomes yet. The project will have implemented best practice in relation to strategies to increase the use of seatbelts and it is anticipated that the project will see an increase in seatbelt restraint use of at least 20%.

In Summary, "Motor vehicle injuries are one of the most common causes of preventable injuries and fatalities in children" (Stokes et al., 2000, p. 875). China is the fastest-growing vehicle sales market in the world, and is expected to grow dramatically over time. However, the road crashes are increasing as the vehicles on the road also increase in China. There is no research to date on parents' knowledge and use of safety seats for their children in China. The purpose of this study is to examine parents' knowledge and car safety seats use among Chinese families and compare with Chinese immigrant families living in Canada. It will be a first step to promoting and enforcing relevant safety policy and regulation in China, and will help health professionals here in Canada to provide culturally sensitive health education to Chinese immigrants.

CHAPTER III

THEORETICAL FRAMEWORK

Neuman's Systems Model

The Betty Neuman Systems Model provided the theoretical framework for this research. The Neuman model uses a systems approach which is an ideal fit with child seat safety research. Children's safety in vehicles is highly dependent on several systems, namely, the immediate environment of the vehicle the child is traveling in, the road infrastructure system in which vehicles collectively travel and the community system in which families live and travel during day-to-day life. This study is part of a larger program of research which used the Neuman model to develop an educational intervention strategy for Canadian families traveling with child occupants in their vehicles (High, L., 2005).

The Neuman Systems Model is an open systems model that reflects a wholistic, multidimensional approach to the client as a system. The model focuses on the wellness of the client system in relation to environmental stressors and client reactions to stressors (Neuman, 1995). A system can be a single individual, a group, or even a number of groups who exist within a social system. In this study, the client system of particular interest was the family system, being Chinese parents with children aged 0 through 12 years old living in China and in Canada. The goal of nursing is to use the systems approach to both promote and protect client stability (Neuman, 1995). In every system, stability implies a state of balance requiring adequate energy exchange between the system and the environment to cope with potential or imposing stressors. Thus, the overall goal of the system is to retain, attain or maintain system wellness (Neuman,

1995). In this study, system stability refers to how parents offer protection for their child in order to maintain "stability" (prevention of injury or harm in the event of a MVC) of the family within the motor vehicle environment. The specific environment of interest in this study is the vehicle environment in which parents interact to provide some form of protection of their child from injury. Thus, safety behaviors of parents take place when the parent and child system exchanges energy within the motor vehicle and roadway system.

One of the most important dimensions of the Neuman model is the focus on health promotion. In this model, "health promotion is a component of the primary prevention-as-intervention modality" (Neuman & Fawcett, 2002, p. 29). Health promotion according to Neuman is considered an area of primary prevention and becomes an important nursing goal (p. 29). Neuman suggests that to provide health promotion as a primary prevention-as-intervention modality, one must identify the needs or existing practices of the population under study (Neuman & Fawcwtt, 2002). Specifically, the Neuman model was used to examine what the existing practices are regarding car seat use of the Chinese parent populations in China and Canada. In order to develop prevention and health promotion strategies about the use of safety seat systems and injury prevention with appropriate use, it is necessary to understand the needs or patterns of this specific population.

The primary dimension of the Neuman System Model that formed the basis of this study was "primary prevention as intervention" (Appendix A). However, before prevention and intervention strategies can be developed, the baseline information needs to be gathered and analyzed. Primary prevention, as wellness retention, is accomplished

by strengthening the flexible line of defense in order to protect the client system usual state of wellness (Neuman, 2005). "The goal is promote client wellness by stress prevention and reduction of risk factors, which includes strategies for health promotion" (Neuman, 1995, p.33). In this study, the major goal was to examine Chinese parents' awareness of risk and knowledge of safety seat use for child occupants in vehicles. The importance of safety seats in decreasing the risk of death and severe injury for children due to motor vehicle crashes has been well documented globally (WHO, 2004). Yet, there are very few studies of child occupant safety in developing countries such as China, nor are there any child seat safety studies of Canadian families of specific cultural groups. The goal of this study was to examine Chinese parents' awareness and knowledge of child occupant safety in vehicles both in China and in Canada. The findings of this study may offer important, system level insights into the need for culturally specific educational programs to enhance the safety of children traveling in vehicles in China as well as in Canada when families from China immigrate to this country.

"Primary prevention as intervention" is a nursing strategy that can begin at any point at which a stressor is either suspected or identified (Neuman & Fawcwtt, 2002). Primary prevention offers nurses an important approach to preventing the very high number of occupant deaths in China as it rapidly increases the volume of vehicles on China's roadways with little or no legislation to regulate safety restraint use such as child seats for child occupants. In Canada, prevention as intervention is a hallmark of the Canadian public health system which is mandated to prevent injury through school health programs on car seat safety and bicycle helmet safety for example. Chinese families who

are new to Canada may be at particular risk of occupant injury due to crashes as a result of lack of awareness of the importance of child safety seats for their children traveling in vehicles.

This research is based on primary prevention and prevention as intervention and the following are two assumptions from the Neuman's System Model. The first assumption is that "many known, unknown, and universal environmental stressors exist" (Neuman, 1995, p.17). Each stressor differs in its potential for disturbing a client's usual stability level, or normal line of defense. Motor vehicle crashes occur everyday, they are unplanned events and this event could happen to anyone, anywhere, at any time, leaving few families free from injuries that are often severe. A motor vehicle crash is viewed as a stressor, which may have some impacts on every family member. It is well documented in the literature that a motor vehicle crash is a potential universal stressor for all children in society, as well as their parents (Weber, 2000). A child's involvement in a vehicle crash has the potential to disrupt the usual wellness state or stability, which can be translated into injuries or death. The flexible line of defense is the first line of defense to help protect the child from possible outcomes of a motor crash. Therefore, the goal is to strengthen the flexible line of defense through prevention. To strengthen the flexible line of defense, we need to understand the parents present use patterns. Knowledge is required to have a better understanding of how to maintain a safe environment for children riding in motor vehicles in order to maintain client stability or wellness. The method "is to assess the client system's perception of stressors, and identify the client system's major problem, stress areas, or areas of concerns" (Neuman, 1995).

The second assumption is, "primary prevention relates to general knowledge that is applied in client assessment and intervention in identification and reduction or mitigation of risk factors associated with environmental stressors to prevent possible reaction" (Neuman, 1995, p.20). In this study, the central focus is to fully understand Chinese parent's knowledge, awareness, and use of safety seats for their children in order to support nurse's ability to identify risks factors that are a priority for this population. In order for nurses to adequately assess and intervene to use primary prevention as intervention, empirical evidence for the development of the intervention is important. Thus, the empirical study of parent's knowledge and use of child safety seats, what factors influence the use of safety seats, and how parents use safety seats during family routines and rituals offers an important empirical basis for how nurses can design intervention approaches effectively for Chinese families.

Nursing actions for "primary prevention as intervention" includes such things as: (1) preventing the invasion of stressors, (2) providing resources to retain or strengthen existing systems, (3) support positive coping and functioning, (4) desensitizing existing or possible noxious stressors, (5) motivate, educate and reeducate (Neuman, 1995). Each of these nursing strategies broadly defines how prevention is used as an intervention strategy to essentially protect the family from stressors. However, in order for nurses to identify interventions to either prevent stressors, strengthen existing systems, support functioning or educate families, it is imperative that the nurse identifies the potential for stressors such as vehicle crashes, the existing system strengths to protect a child traveling in a vehicle, and the parent's knowledge and awareness of the risk of injury while traveling before intervention programs can be developed for a specific population such as

Chinese families. Thus, the Neuman Systems Model provided a theoretical context for the assessment of Chinese parents' awareness, knowledge and use of children's safety in vehicles in both China and Canada.

Motor vehicle crashes are the leading cause of death of children in Canada (Transport Canda, 2005) and are the second leading cause of death of children in China (WHO, 2004). Yet, injuries and deaths due to road crashes is considered preventable in 67% and 74% of crashes respectively with the effective use of safety seats for child occupants (Decina &Lococo, 2005). Therefore, primary prevention is the most centrally important nursing strategy to protect children from both death and injury on Canada's roadways, given the rapid increase in vehicles on roadways in China (National Statistics of China, 2006), primary prevention offers an important strategy for nurse professionals in both China and Canada.

The Neuman System Model is an appropriate framework for supporting families to maintain vehicle safety for their child(ren). According to Neuman, the first step for nursing intervention is "assessing the client/ client system's perception of stressors, identifying the client/client system's major problem, stress areas, or areas of concern" (Neuman, 2002). This study provides an important first step in documenting parents' knowledge of the importance of a child's safety within the vehicle environment. Health professionals' ability to develop effective education programs to enhance the protective systems parents offer their children while traveling in vehicles are an important "primary prevention as intervention" strategy for nurses to employ with this population of families. Intervention goals could include education and appropriate supportive actions toward achieving optimal family wellness, by augmenting existing strengths (use of seat belts,

child safety seats) related to the flexible line of defense and there by decreasing the possibility of risk of injury and death to child occupants in vehicles (Neuman, 1995). Interventions must also account for the importance of the Chinese culture and how cultural values and rituals impact parent roles in protecting children in vehicles (i.e., which parent is responsible for driving) and making decisions on the use of safety seats for their children in vehicles.

CHAPTER IV

METHODOLOGY

Research Design

A cross-sectional descriptive design was utilized to investigate safety seat knowledge and use of Chinese parents and Chinese immigrant parents living in Canada. A comparison between these two groups of Chinese parents provided an important context for understanding these parents' knowledge and experience of keeping their children safe in vehicles.

Sample

There were 872 parents who participated in this study in Beijing, China, and 96 parents from China living in Canada. Subjects were anonymous. The target population identified for this study were families residing in Beijing, China and families immigrated to Canada in within the past three years, from Mainland China. Parents eligible to participate met the following criteria: (1) able to read, write and comprehend Chinese, (2) 18 years of age or older, (3) competent to give consent to participate, (4) have at least one child, and (5) Chinese immigrants have lived in Canada for at least 6 months.

The reason that participants required to live in Canada at least six month was measure the effect of living in Canada for a minimum period.

Participants in China were recruited from Vehicle-Retail Malls, which include vehicle retail shopping areas, vehicle parts shops, and vehicle related services are centrally located. Most people who go there have vehicles or want to buy vehicles. In Canada, Chinese parents were recruited from the Chinese community centers and programs (such as church). Recruitment advertisements pertaining to the study was

posted throughout the community (see Appendix C). These sheets identified the purpose of the study and alerted potential participants of the opportunity to volunteer for the study. The recruitment process was conducted by the researcher. All eligible participants were approached by the researcher. Eligible participants were informed of the study purpose, confidentiality was maintained at all times, study procedures and potential benefits and risks of the study were explained to all participants in Mandarin. Direct financial compensation was not provided. A signed consent was obtained from each family. In addition, a letter of information was provided to the participants at the time of consent (see Appendix D).

Data Collection Procedures

Beijing, China. Parents were approached by the researcher in Motor Market / Motor Mall in which included vehicle retail shopping areas, vehicle parts shops, and vehicle related services are centrally located. The location was selected to easily identify families who own and drive vehicles. The purpose of the study was explained to the parent. Those who agreed to participate completed the survey instrument with the researcher nearby to answer questions. According to Chinese culture, a small gift (a ball-pen) was provided to the participant.

Canada. Parents were approached by the researcher in Chinese communities, such as the Chinese church. The purpose of the study was explained to the parent. Those who agreed to participate completed the survey instrument.

Data were collected through a structured self-administered questionnaire (see Appendix E). The questionnaires were provided to eligible participants by the researcher.

The completion of the questionnaires took the participants approximately 15 minutes. The survey was available for parents in Mandarin or English.

Instrument

The participants completed a single self-administered questionnaire in Mandarin. The survey was composed of 45 open and close-ended questions. The questionnaire was translated from a previous instrument used for a Canadian population. The survey was translated and back translated to support the validity of the instrument. Specifically, the survey collected information related to parents' knowledge and use of child car restraints (15 questions), vehicle information (9 questions), child information (3 questions), sources of information on safety parents access (4 questions), and parent demographic information (14 questions).

The survey for this study was based on the English version of the questionnaire which had already been translated into Chinese by professional translators then back-translated into English to ensure semantic equivalence and supported validity. The survey was composed of five sections, consisting of 45 questions in total. The first area is composed of 15 knowledge questions which included information about correct use such as placement of the child in the vehicle, types of restraints, safety features, and the personal experience of car seat use. The second section is location of the children in the vehicle, pertaining to vehicle information such as make of vehicle, and year of vehicle. The third area contained three questions, which included some questions related to child information, such as the age and gender of the child. The fourth section contained four questions related to sources of information, such as where car restraint information was obtained by the parent. The fifth section contained 14 questions related to parent

demographic information, such as gender, age, family income, and marital status. The survey had questions structured in both positive and negative formats in order to decrease response bias and social desirability. Upon completion of the questionnaire, the researcher collected all completed surveys, all survey data remained anonymous, so no participant could be identified. The completed surveys were then sorted and coded by the researcher and entered into SPSS software for analysis. The original surveys were kept locked and secured until all data had been entered into the computers, and was only accessible by the researcher.

Validity and Reliability of the Instrument

Content validity addresses the appropriateness of the instrument items as they relate to the particular constructs under investigation (Polit & Beck, 2004). The questionnaire utilized for this particular research study had been previously used in which the construct of vehicle restraint use was thoroughly examined and supported. Content validity was supported in a series of pilot studies of the survey instrument for this study. Initially, the instrument was administered to ten Chinese nursing students who were asked to identify questions they felt were difficult to answer or understand. On the basis of that pilot test, changes to the survey were made and it was administered a second time to ten different Chinese people (not nursing students). On the basis of the second pilot study, the survey was piloted a third time and was administered to a group of 5 parents of children under 9 years of age in the community. Any questions that were unclear or difficult to understand were re-written and clarified. Once the pilot testing was completed, and no further issues of clarity were found, the study sampling began.

Data Analysis Procedures

Data analysis procedures were performed using the Statistical Package for Social Sciences (SPSS) computer program (version 15.0; SPSS Inc, Chicago, Ill). Survey findings for Chinese immigrants living in Canada were compared with Chinese people living in China. Descriptive statistics, such as frequencies and percentages, and means and standard deviations was used to portray the characteristics of the sample, as well as the description of the participants' responses. The demographic data from parents were categorical, ordinal and interval in nature and the findings from the frequency analysis were presented descriptively. The difference in knowledge levels between Chinese and Chinese immigrants was analyzed using Chi-square and t-tests. Logistic regression was used to explore the predictors of parent knowledge and use of safety seats for each group of parents, those living in China and those living in Canada. This analysis was conducted in order to compare the similarities and differences in knowledge and use of safety seats in the two countries. This comparison provided a rich description of potential areas for intervention for families immigrating to Canada from China.

Ethical Considerations

This study conformed to Tri-Council Policy standards for the ethical conduct of research and ethical approval was obtained from the Research Ethics Board of the University of Windsor (Windsor, Ontario, Canada). Informed consent (see Appendix B) was obtained from all study participants under the supervision of the researcher. The data collected from the participants were coded to ensure confidentiality and were secured in a locket cabinet only accessible by the researcher.

CHAPTER V

RESULTS

The purpose of this study was to examine Chinese parents' knowledge and use of child seats in China and Canada. The results provide a wide range of insights into parents' knowledge and use of child safety seats in China and how it differs in Chinese families newly immigrated to Canada.

Nine hundred and sixty-eight parents participated in this study, eight hundred and seventy-two in China, and ninety-six in Canada. The demographic description of parents of two samples is listed in Table 1. In both groups, most parents were from 26 to 35 years old, most were married (99.3% in China sample, and 98.9% in Canada sample), and most of them were educated at the post-secondary degree level. Almost half of the participants in China were fathers, and 36.5% fathers in Canada involved in this study. The mean age of children was approximately four years old (52.24±40.64 months) in China, and 4.5 years (54.8±32.95 months) in Canada. The youngest child involved in this study in Canada was 4 months, and the eldest one was 12 years old. In China, the youngest child was newborn and the eldest was 14 years old. The demographic description of children is shown in Table 2.

Table 1

Demographic description of parents

Variable	China N (%)	Canada N (%)
Age (years)		
<18	0	0
18-25	2 (.24)	0
26-30	232 (27.42)	3 (3.2)
31-35	345 (40.78)	41 (43.2)
36-40	211 (24.94)	40 (42.1)
41-45	49 (5.79)	9 (9.5)
>45	7 (.83)	2 (2.1)
Relationship with child		
Mother	468 (53.8)	61 (63.5)
Father	398 (45.7)	35 (36.5)
other	4 (.5)	0
Marital status		
Married	866 (99.3)	93 (98.9)
Education		
High school	36 (4.1)	1 (1)
College	149 (17.2)	11(11.5)
University	550 (63.3)	47 (49)
Postgraduate	134 (15.4)	37 (38.5)
Years of driving experience		
<6months	95 (11)	11 (11.9)
6-12months	157 (18.2)	7 (7.5)
1-3yrs	289 (33.5)	20 (21.5)
3-5yrs	151 (17.5)	23 (24.7)
5-10yrs	127 (14.7)	24 (25.8)
>10yrs	44 (5.1)	8 (8.6)

Table 2

Demographic description of children

Child	China N (%)	Canada N (%)
Gender		
Male	432 (49.6)	50 (54.3)
Female	439 (50.4)	42 (45.7)
Age		
1-12 months	190 (22.0)	6 (6.7)
1-4 years	275 (31.7)	37 (41.6)
4-10 years	360 (41.5)	42 (47.2)
Over 10 years	42 (4.8)	4 (4.5)

Correct Use of Child Restraint Devices (CRD)

In China, many parents (n=577, 66%) reported that they do not have a car seat at all, while most Chinese parents (n=83, 86.5%) living in Canada reported having car seats.

When parents were asked whether they use any restraint in vehicles for their children, the non-use rate was very high in families in China. There were 409 (46.9%) parents who reported that they did not use any restraints for their children in vehicles. By comparison in Canada, there were only eight parents (8.33%) reported that they did not use any restraint for their children when traveling in a vehicle. Children over 4 years old were more likely to be not using a restraint when riding a vehicle in both groups.

Chinese parents living in Canada had a significantly higher rate of child restraint use than their counterparts (X^2=52.467, p<0.01) in China. Just over half (n= 463, 53.1%) of parents living in China reported that they used child restraint device, while 91.7% (n=88) parents living in Canada used a CRD. Among those who reported that they have used some form of safety restraint in China, some parents (28%) reported that they only used seat belts for their children. Although the rate of restraint use for their children is much higher in Chinese parents living in Canada, both groups had a very low rate use of booster seats.

In China, parents of infants (less than 12 months) were the most likely to use a safety seat for their child (X^2=136.51, p<.01). The majority of parents who had school-aged children in China (84.72%), did not own forward facing car seats or booster seats for their children.

In Canada, most Chinese parents who had children less than 4 years old used car seats for their children. However, for those children over 4 years old, most of them (97.6 %) just use a seat belt as a restraint in the vehicle.

Parents were asked what type of CRD their children were presently using at the time of the survey. The concept of correct use of safety systems in this study was defined as correct seat for the age, height and weight of the child (i.e., correct rear-facing seat for less than12 months and less than 20 pounds, forward facing = 21 to 40 pounds, and 27 to 40 inches, booster seat = 41 to 80 pounds and 41 to 56 inches, and seat belt ≥ 80 pounds and 57 inches tall) (American Academy of Pediatrics, 2007). The rate of correct use and nonuse of CRD are described in table 3. Both groups had a very low rate of correct use of booster seat (5.23% in China, and 3.7% in Canada).

Table 3

Correct use of CRD in China and Canada

	China			*Canada*		
Child	Total sample (n)	Correct use N (%)	Nonuse N (%)	Total sample (n)	Correct use N (%)	Nonuse N (%)
Infant ≤12m 0-20lbs	108	57 (52.78)	18 (9.47)	5	2 (40)	0 (0)
Infant ≤ 12m 21-40lbs	71	13 (18.31)		1	1(100)	
1yr – 4yrs 20-40lbs	134	74 (55.22)	120 (43.64)	34	28 (82.35)	0 (0)
4yr – 9yrs 20-40lbs	28	10 (35.71)		9	8 (88.89)	
4yr – 9yrs 40-80lbs	153	8 (5.23)	225 (64.84)	27	1 (3.7)	4 (9.52)
4yr – 9yrs ≥80lbs	7	4 (57.14)		2	1 (50)	
Over 9yrs old ≥80lbs	34	11 (32.35)	41 (74.55)	0	N/A	4 (100)
Total	535	177 (20.3).	404 (46.9)	78	41 (42.71)	8 (8.3)

Note: N/A means that there is no sample belongs to this category. 0 means that no one use CRD correctly in this group.

In total, 177 children were reported by the parents as correctly using safety seats in China, the overall correct use rate was 20.3% for the entire sample in China. Close to 80% of children in China were either incorrectly using seat belts or using no restraint system of any kind. Forty one children were reported correctly using safety seats in Canada, the overall correct use rate was 42.71% for the entire sample in Canada. More than half of children in Canada were either incorrectly seated or using no restraint system of any kind. There was no significant difference of correct use rate between the two groups of parents. In China, parents of children less than 12 months had a higher rate of correct use for their children (X^2=51.53, p<.01) than Chinese parents of infants in Canada. In Canada, parents with preschool children (one to four years old) had a higher correct use rate than parents in China (X^2=30.36, p<.01). However, this study did not observe for accuracy regarding installation of the safety seats these families were using. Premature use of seat belts for children was also examined in this study. Use of seat belts for children aged 0-12 years old in China and Canada are illustrated in Figure1 and Figure 2.

Overall, only one fifth of children in the study in China were seated in the correct safety seat for their height, weight, and age. To examine the contribution of parent's knowledge, country, relationship with child (mother or father), parental seat belt, and parent's age on the rate of correct use of safety seats for children, a logistic regression analysis was conducted. Among those independent variables, only parents' knowledge level was a factor that could predict correct use of CRD for children (odds ratio, 1.61; 95% CI, 1.407-1.835; p<.001). Parents who were more knowledgeable were 1.61 more likely to correctly use correct safety seats.

Figure 1

Premature use of seat belt in children aged 0-12 (China)

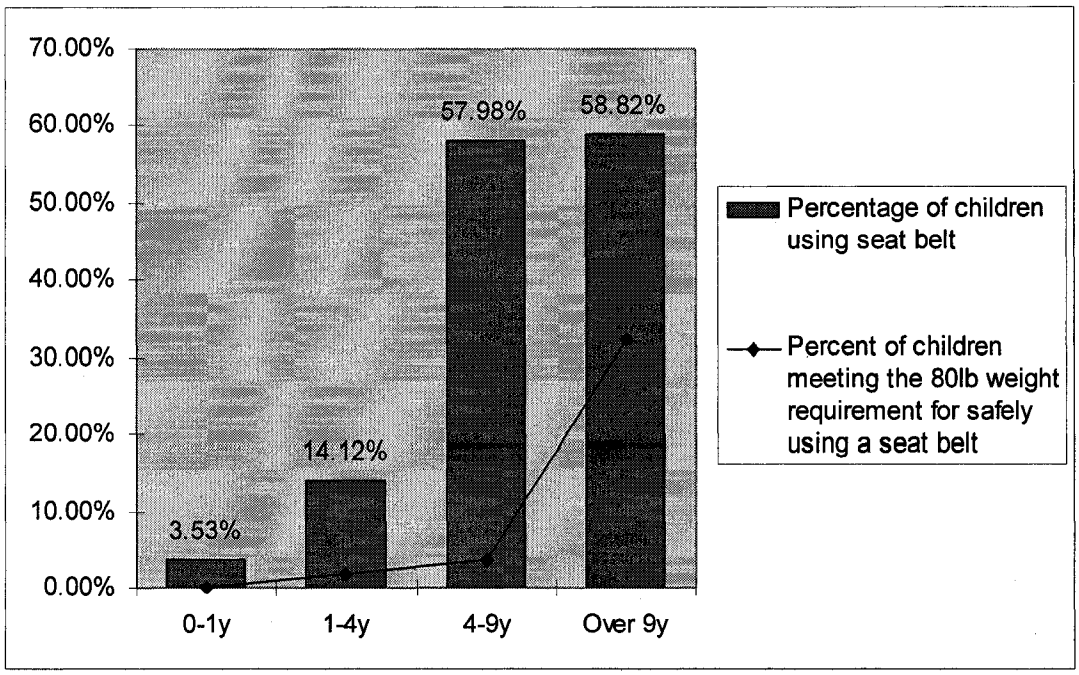
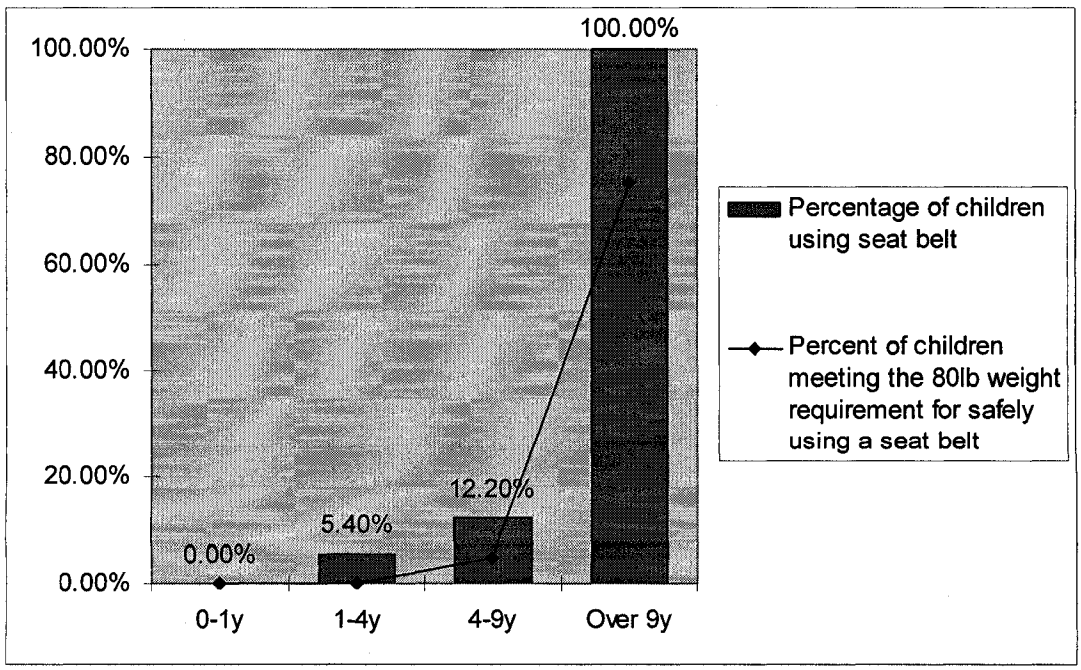


Figure 2

Premature use of seat belt in children aged 0-12 (Canada)



Parents' knowledge. There were four questions on the survey designed to examine parents' knowledge of CRD use. Each question was assigned a score of 1 for correct and 0 for incorrect. Parents' knowledge was scored from 0 to 4 depending on the number of correct answers given by each parent. The questions indicating parent knowledge are listed in Table 4. There was no significant difference of knowledge scores between two groups of parents. The mean score of parents' knowledge in China was 1.64 ± 1.24, and 1.69 ± 1.19 in Canada. However, when comparing knowledge scores of fathers and mothers in China, fathers were more knowledgeable regarding CRD use than mothers (mothers' score = 1.55 ± 1.21, fathers' score = 1.74 ± 1.28, $t=-2.30$, $p<.05$). There was no significant difference of knowledge scores between fathers and mothers in Canada.

The data indicated that 30% of parents in China think that holding a child in an adult's arm is a good way to protect a child less than 12 months old when traveling in a vehicle. Only 22.7% parents reported that the best way to protect a child 4-9 years old was a booster seat. Only 23.7% of parents in China felt it was safe enough to use a seatbelt to protect this age group (4-9 years old) of children.

In China, mothers were more knowledgeable regarding CRD for children 4-9 years old than fathers ($X^2= 7.253$, $p<0.05$). And more fathers were able to select the correct illustration of wearing a seat belt for children when compared to mothers ($X^2= 15.27$, $p<0.01$).

The Pearson correlation coefficient for parent's knowledge level with child's age (in months) in China was $r= -.319$ ($p<.01$), which indicates that parents who had younger children were more knowledgeable of safety seat use than those who had older children.

Parents who had children less than 12 months old were more knowledgeable of safety seat use than other parents. In Canada, Parents who had younger children were less knowledgeable of safety seat use than those who had older children (r=.243, p<.05).

Table 4

Parents' knowledge

Knowledge Indicators	Correct answer of Parents in China (%)		X^2	Correct answer of Parents in Canada (%)		X^2
	Fathers	Mothers		Fathers	Mothers	
Car seat is the best way to protect infant in vehicles	42.71	35.47	4.96	48.57	40.98	.52
Car seat is the best way to protect child between 1 to 4 years old in vehicles	46.23	38.46	5.43	42.86	55.74	1.48
Booster is the best way to protect child between 4 to 9 years old in vehicles	18.59	26.28	7.25*	20	31.15	1.4
The picture of correct use of seat belt accurately identified	66.83	54.7	15.27*	60	39.34	3.81

* p<.05

Location of Child in the vehicle. Parents were asked to describe where their child usually sits in the vehicle when traveling. Positioning in the vehicle was defined by ideal and acceptable, compromised and at risk. Ideal, by definition means that the child would

be placed in the most ideal location of the vehicle being the middle of the back seat. Acceptable was defined as the outboard back seats of the vehicle either behind driver's seat and/or behind the front passenger seat. Compromised and at risk by definition was when the child was placed in the front seat of the vehicle with no air bag or seated in the front seat with an active air bag placing the child at a higher risk for injury. When location of the child in the vehicle interior was examined, most children were seated in the ideal or acceptable location of the vehicle in both groups (83.4% families from China, and 99% from Canada seat their child in the rear seat). However, in the China sample, only 39% of parents in this study reported that their children never sit in front seat of the vehicle. When parents were asked if their children ever sit in the front seat, 61% of the children were reported to sit in the front seat for the following reasons: "children like to sit in front seats" (33.9%); "when there are many passengers in the vehicles" (27.9%); and "parents like children to sit next to them" (22%). Many mothers in China mentioned that it is easier to take care of their children if children sit in front seats when only the driver and child are occupants in the vehicle. Fathers in China described that it was easier for their children to handle the CD player when they sit in front seats, so both parent and child could enjoy traveling in the vehicle together.

In Canada, 86.5% Chinese parents reported that their children never sit in front seats. The only reason parents in Canada described for seating the child in the front seat was when a lot of people are being transported (33.3%).

Seat belt use and knowledge in parents. Seventy nine percent parents in China reported that they use a seatbelt all the time when traveling in vehicles, compared to 96.9% of parents in Canada.

Parents' knowledge of correct use of a seat belt was examined by asking parents to select from six illustrations of children seated with seat belts. Only sixty percent of parents in China could identify the illustration of the correctly placed seat belt, while only 48.4% of parents in Canada could select the right picture. Parents in China who reported wearing seat belts all the time while driving had a higher rate of correctly identifying correct use of seat belts compared to Chinese parents living in Canada (X^2=80.39, p<.01).

Factors influencing use of safety seats

Non-Use Factors. Parents were asked whether they used a safety seat for their child. Fewer than half (46.9%) of parents in China reported that they did not use restraints for their children, and only 8 parents (8.3%) in Canada did not use CRD for their children. The reasons that parents did not use CRD for their children are described in table 5. Among those parents who reported not using a CRD in China, the most common rationale given was that car seats are not available (30.9%) (i.e., Not easy to find in the store, parents do not know where to purchase a safety seat), and the higher price (25.4%) of safety seats was also a factor. Other reasons described for non-use of CRD for their children in China included "not necessary to use car seats" (18.6%), "like to hold their children in the vehicle" (17.6%), and "it is troublesome to setup/use car seats" (16.8%). Many parents in China perceived that seat belts were adequate enough to protect their children in vehicles.

In Canada, among those who did not use a CRD for their children, the main reason described was parents did not think it was needed CRD (28.6%). Other reasons included child does not like it (7.1%), too expensive (7.1%), and difficult to set up/use car seats (7.1%).

Table 5

Reasons for non-use child safety seats

Reason	Percentage in China N (%)	Percentage in Canada N (%)
Do not think it is needed	102 (18.6)	4 (28.6)
Availability	169 (30.9)	0 (0)
Nobody use it	75 (13.7)	1 (7.1)
Uncomfortable for the child	70 (12.8)	0
Child dose not like it	84 (15.4)	1 (7.1)
Too expensive	139 (25.4)	1 (7.1)
Not required by law	87 (15.9)	1 (7.1)
Prefer to hold child in a vehicle	96 (17.6)	1 (7.1)
Difficult to setup/use	92 (16.8)	1 (7.1)

More than half (56.5%) of parents in China reported that it is difficult to find a car seat in China, whereas most parents in Canada (92.6%) found it is easy to find a car seat for their children. Many parents in Canada mentioned that they wanted more information related to used car seats.

Reasons why parents buy car seats for their children. Table 6 describes the factors that are important to parents when they are considering purchasing a car seat. Safety (37.8%), availability (28.4%) and price (27.5%) are the primary consideration for parents when they buy a car seat for their child in China. In Canada, 81.3% of Chinese parents view safety as an important factor when considering the purchase of a car seat.

Twenty percent of parents reported that price was a big issue for them when buying car safety seats for their child. In both groups, parents did not consider any laws or legislation as important factors to consider when traveling in vehicles.

Table 6

Factors parents consider when purchasing a car seat

Factor	China (%)	Canada (%)
safety	37.8	81.3
Availability	28.4	0
Price	27.5	20
Whether or not required by law	15.8	13.5

Table 7

Rationale for occasional non-use of safety seats in families who own safety seats

Rationale	China (%)	Canada (%)
When transported by people other than his/her parents	4.3	6.7
On short trips in the city	26.1	20
On the short trips in the neighborhood	7.7	3.3
On the highway	1	0
When using other's vehicle	31.9	36.7
Child uses a seat belt	21.3	20
Child seat is not available	13.5	6.7
Do not think it is needed	21.4	10

In China, only 15.1% parents reported that they use safety seats for their children all the time. Table 7 illustrates reasons that parents who occasionally decide not to use CRD for their child. In China, The main reasons that parents described for not using CRD all the time for their children are when using other's vehicle (31.9%) and on short trips (26.1%). Many parents mentioned that they always drive slowly (20-40km/hr) in the city because of heavy traffic in Beijing, so they do not think a CRD is necessary. Parents also indicated that whenever they drive on a highway or at higher speed, they definitely use a CRD for their children.

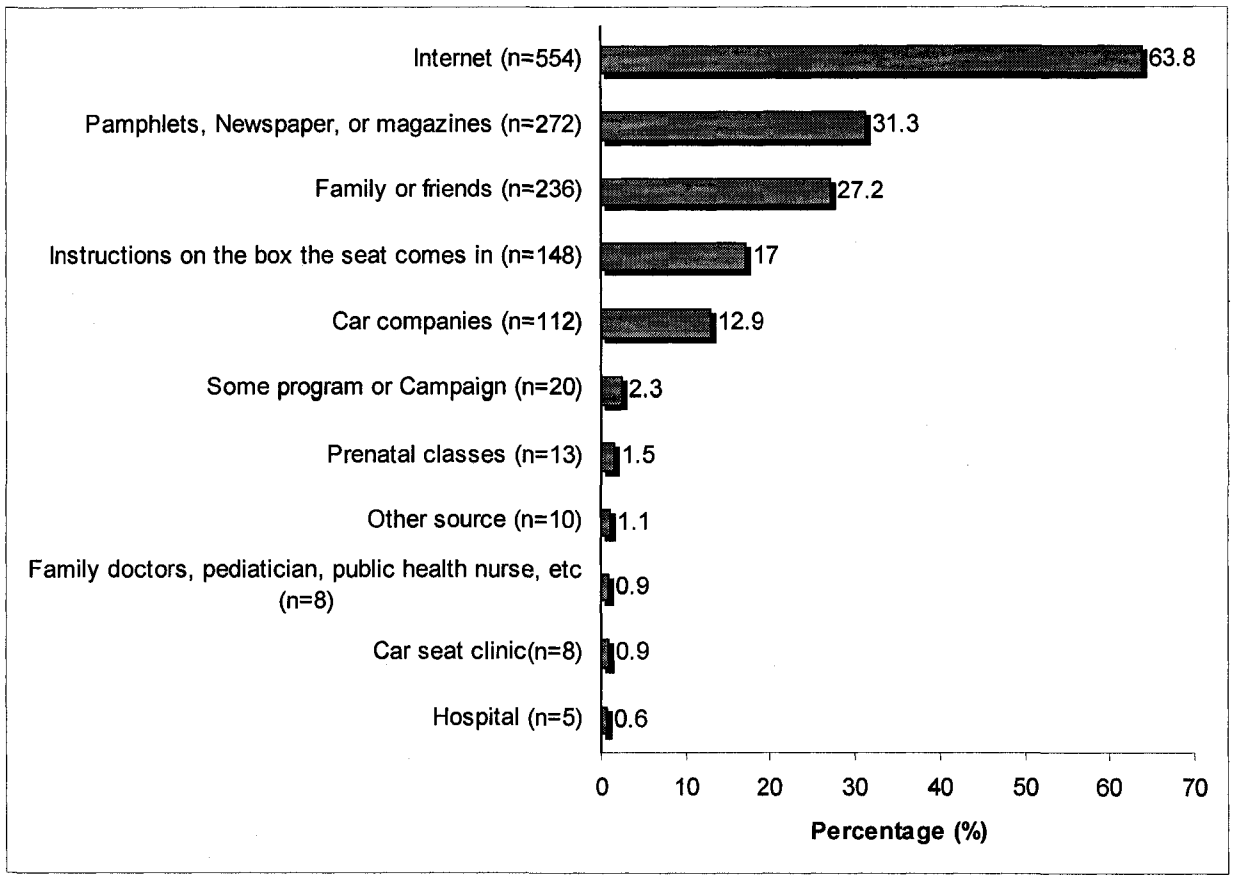
In Canada, 74% of Chinese parents reported using a safety seat for their child all the time. Using other's vehicle (36.7%) was the main reason that parents choose not use a safety seats for their child. The following reasons are on short trip (20%) and when child using seat belt (20%).

Legislation. Although a few parents considered a safety seat related law as an important factor when they considered purchasing a safety seat for their child, most parents believed that China should have child vehicle safety law (87.2% in China's sample, and 95.8% in Canada group).

Sources of Information. Parents were asked to describe the sources of information they routinely accessed to learn about safety seats for their children. The source of information that parents accessed varied substantially in the two groups of parents. Both parent groups (in China and Canada) seek information primarily from non-professional resources (Figure 3 and Figure 4).

Figure 3

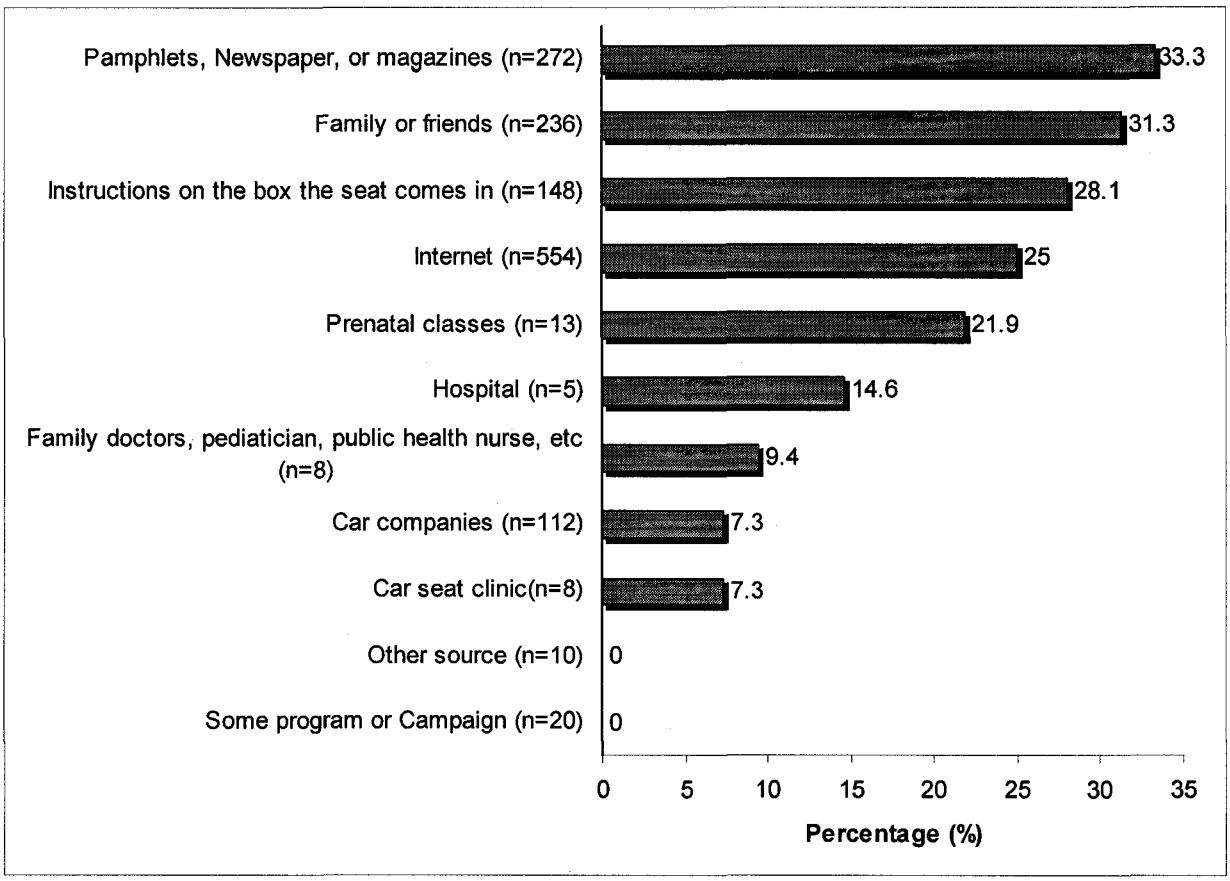
Source of information accessed in China



The internet was the most common source of information for parents in China (63.8%), in addition to pamphlet, newspaper, magazines (31.3%), and family and friends (27.2%). Car seat instruction manuals (17%) and vehicle companies (12.9%) were also accessed but much less often. The least common source of safety seat information was the family doctor, pediatrician or public health nurses. Few parents get information from health care providers (hospital, doctors, and nurses). When parents were asked to describe how they access information, the majority of parents (82%) reported that "it was not easy" to get safety seat information, and over half of parents (63.2%) wanted to get more child safety related information.

Figure 4

Sources of information for Chinese parents in Canada



The main sources of information for Chinese parents living in Canada regarding the use of safety seats was media (pamphlet, newspaper, and magazine) (33.3%), and from family and friends (31.3%). Other sources for Chinese parents living in Canada were instructions on the box the car seat was packaged in (28.1%), the internet (25%), and prenatal classes (21.9%). The sources of information for Chinese parents living in Canada differed substantially in the use of the internet when the two samples of parents were compared. Many parents in Canada (68.4%) indicated that they wanted more safety seat information, especially information translated into Chinese since they are not

familiar with child safety seat use in Canada. More than half of parents (55.8%) in Canada reported that it was not easy to get information.

Frequency of transporting children. In China, 78% of parents transport their children in vehicles more than twice per week. Fathers assume a more dominant role transporting children. Almost half (49.8%) of fathers reported that they transport their children more than 4 times per week, while only 30% of mothers reported that that they transport their children more than 4 times per week (X^2= 121.04, $p<0.01$). One third of mothers (32.5%) reported that they transport their children less than once per week, suggesting that fathers assume most of the responsibility for transporting their children in vehicles in China.

There was no significant difference between how often fathers and mothers transported their children in Canada. The majority parents in Canada (87.6%) transported their children more than 2 times per week. More than half of parents (56.3%) indicated that they transported their children more than 4 times per week.

Other transportation for children. Taxi plays an important role in transportation in China. Over half of parents (61.5%) reported that they used a taxi as the other transportation for their children. Usually, few parents used safety seats in taxies for their children. In Canada, 67.7% of parents indicated that a friend may transport their child in a vehicle as an alternative form of transportation.

CHAPTER VI

DISCUSSION

This study provides a preliminary view of Chinese parents' knowledge and use of child restraint in vehicles. Findings from this study portray insights into the use of child safety seats and seat belts for children of Chinese parents in both Canada and China.

Correct/Incorrect Use of CRD among Chinese Parents

The most compelling finding in this study was the very high rate of non-use of restraints for children in China. Over four hundred families in China reported that they do not use child restraints (either seat belts or safety seats) for their children while travelling in vehicles, compared to fewer than 8% of Chinese families living in Canada. Unrestrained children (particularly those in front seat) are at the greatest risk of injury (Berg, Cook, Corneli, Vernon, Dean, 2000; Durbin, Chen, Smith, Elliott, & Winston, 2005).

As China became a member of World Trade Organization (WTO) in 2001, the number of vehicles on the roadways of China has grown exponentially in recent years. It is no longer a privilege for Chinese people to own a vehicle. More and more families in China have cars, especially in big cities. Beijing has the largest number of vehicles in China. Vehicles in Beijing reached nearly 3 million in 2006 and more than 4.24 million people in Beijing have driver licences (Beijing Traffic management Bureau, 2007). However, while vehicles are more popular in China, the issue of children's safety in vehicles is not widely known or publicly identified in China. The legislation and cultural awareness of safety is largely unknown and undeveloped in China. In an internet survey conducted in a famous website in 2005 in China, around 80% of people are not aware of

children's safety in vehicles, and half of respondents reported that they would most often put children in front seats (Jiang, 2005; Tong, 2005). Another survey conducted in Hangzhou (a big city in southeast China), China in 2006 found that 80% drivers in Hangzhou were 20 – 35 years old, most of them have children, and they usually took the role of transporting their children. However, few of those parents considered the issue of child safety in vehicles and few of them use child safety seats for their children. The most common family routine in big cities in China is father drives the car, and mother sits in front seat holding the baby (China Child Safety Seat website, 2007). The findings of this study validate this earlier research in China and provides additional insights into parent's awareness and use of child seats in China in comparison to Chinese parents in Canada.

Seating position also places children at risk for serious injury or death in a crash, particularly in vehicles with air bags (Duebin, Chen, Smith, Elliott, & Winston 2005). More than 60% of parents in this study in China reported that their children sit in front seats of their vehicles. Newgard and Lewis (2005) found that the front passenger seat in vehicles with air bags puts children aged 0 through 14 years at 2 to 6 times the risk of serious injury or death. It is currently recommended that children age 12 and younger be appropriately restrained in rear seats. In Canada, parents reported placing their children in the front seats in only one case, a stark contrast to their counterparts in China.

Age-appropriate restraint confers more safety benefit than does rear seating (Durbin, Chen, Smith, Elliott, & Winston, 2005). At any age through 15 years, unrestrained children in the front were always at the highest risk of injury and appropriately restrained children in rear seats were always at the lowest risk. The high risk of injury due to non-use is well documented in North America. However, this risk

appears to be largely unknown to parents in China. It is popular for parents to hold their child while sitting in front seat in a vehicle in China. Many parents in this study mentioned that they think airbags are a good way to protect child in a vehicle.

The rate of safety seat use is lower in China than in Canada, and the rate of correct use of CRD in China is low too. Among those who reported non- use CRD in China, the main reasons are the higher price and not easy to find a car seat in the stores. Awareness of the importance of child safety restraints may be a function of the relative lack of available seats to purchase for their children. Some of the parents commented: "I didn't know there were different kinds of seats" or "I don't know there were special seats for school-aged child (booster seat)." Safety seats are available in few stores in China, even fewer booster seats are available in the market than child seats. And most parents are even not familiar with the word "boosters". In addition, the price of safety seats is much higher in China than in Canada. It is around $200.00 (Cdn) for an infant rear facing seat in a popular on-line shopping website in China, which is much cheaper in Canada where many more varieties of seats are available. Safety seats are usually sold on Ebay for only 25-50 dollars (Ebay, 2007).

Premature seat belt use was also evident in the present study. A lot of parents in both groups appeared to be unaware that children must be a minimum of 80 pounds to safely use a seat belt. It is common for Chinese parents in Canada to transfer their children directly from forward-facing seat to seat belt rather than a booster seat. Inappropriate CRD for the age and size of the child pose serious risks for injury and death if a crash occurs. Fatalities in toddlers and young children cannot be reduced with lap/shoulder belt restraints alone (Ebel, Koepsell, Bennett, & Rivara, 2003a, 2003b;

Winston & Durbin, 1999; Winston, Durbin, Kallan, & Moll, 2000) and can result in serious abdominal and spinal injuries (Osberg & Di Scala, 1992). Optimal restraint with age-appropriate child safety seats (American Academy of Pediatrics, 2002; Hagedorn & Rhule, 2001) significantly lowers these risks in children (Nance et al., 2004). Booster seats reduce the risk of injury by 59% to children ages 4 to 7 years old in crashes (Durbin, Elliott, & Winston, 2003). Therefore, booster seats are important in preventing injuries in this age group. However, in both Canada and China rates of booster seats are extremely low. Given that booster seats are not available in most stores in China, this may account for this low use rate in China. In Canada, booster seat legislation in Ontario has not influenced the rate of booster seat use in the Canadian families in this study. Similarly, a recent national survey of child seat use found that only 28% of children use booster seats in Canada (Snowdon et al, 2007). The low rate of booster seat use among Chinese parents living in Canada, maybe because they are not familiar with the need for booster seats and may be unaware of the law and the rules related to booster seats since they are new comers to Canada and booster seats are virtually unknown to parents in China. In Canada, the use rates of infant seats and forward facing seats are much higher (Snowdon et al, 2007). Public awareness through prenatal classes and education of new parents has been successful in supporting the use of rear-facing safety seats for newborn babies in Canada. However, parents need more detailed information on how and when to transition children into infant seats beyond the newborn period.

Many of the Chinese parents living in Canada in this study raised the issue of using second-hand safety seats for their children. Whether parents use old or second hand safety seats was not the focus of this study. However, it is quite possible that use of

second hand safety seats may be popular among this population perhaps due to the cost savings. Price may be an issue for those new comers to Canada whether or not to use a CRD for their children. Future research may examine how parent knowledge influences Chinese parent's decision to purchase either a new or used safety seat for their children.

The findings of this study raise the importance of public awareness of Child vehicle safety as an important education issue for health care providers. For Chinese health care professionals, it is important to provide education to the public. Parent and caregiver knowledge can be developed and promoted through various education strategies, such as health teaching, anticipatory guidance, self-directed education, and community campaigns. For parents in China, the use of the internet was an important source of information for parents. This may offer an ideal strategy for health promotion program delivery for widespread knowledge transfer to families in China. Additionally, the use of child safety seats increases when legislation and enforcement are combined with community educational campaigns, incentives, and media coverage (General Motors, 2002; Hanfling, Mangus, Gill, & Bailey, 2000; Hovell, Wahlgren, & Gehrman, 2002; Grossman & Garcia, 1999; Lavelle, Hovell, West, & Walhgren, 1992; Milano, McInturff, & Nichols, 2004; Murrin & Gardina, 2004; National Safety Council, 2004; Zaza et al., 2001). There are few such education programs provided by health care professionals in China at present. This research offers an important framework for identifying Chinese parents' need for safety seat education programs.

Factors that Influence Correct Use of CRD

Another issue raised by this study is the value and perceptions of Chinese people regarding child safety in vehicles. The value and perception of society regarding child

safety in vehicles in China is different from here in Canada. Many parents mentioned that they did not use a CRD for their children because they preferred holding their children in the vehicle, which is related to Chinese culture. Chinese parents decide what is most appropriate for their child. In Chinese culture, it is assumed that a child is safest when held by their parent on a parent's lap, as opposed to being seated in a child safety seat when riding in vehicles. It is a strongly held view in China that parents are the chief protectors of their children in Chinese culture. Chinese people perceive that it is better to hold the child to help the child feel more comfortable and safe. Chinese parents indicated that they believed that they could hold their child tight enough to protect the child if anything happened. Chinese people like to hold their young child all the time. They use strollers much less often than western people.

In Canada, "safety first" is a commonly held belief here in Canadian society. However, for those who newly arrive to Canada, the issue of vehicle safety may not a high priority concern. The findings in the study support the need for health professionals to consider developing specialized, tailored health promotion programs for new immigrants to Canada that help families understand the importance of children's safety in vehicles, but also recognize the cultural norms and priorities that these people have been socialized to in their home countries. Health care providers need to support new immigrants to fully understand the importance of their children's safety in vehicles.

With more and more immigrants arriving in Canada every year, the urgency of educating parents regarding child safety seats and the special attention required for effective education programs for these families from different cultures is critically important. Understanding the value and perceptions of Chinese people regarding child

vehicle safety will support health care providers to develop some education programs for this population. China is the largest source of immigrants to Canada. The number of immigrants from China has increased every year since 1996. There were 42,291new immigrants from China to Canada in 2005, which accounts for16.1% of all immigrants (Citizenship and immigration Canada, 2006). Unfortunately, detailed information about laws governing safety restraint use is not readily available to immigrants to Canada. For detailed information, immigrants are directed to consult provincial ministries of transportation (Citizenship and Immigration Canada). Particularly for immigrants who do not speak English as a first language, it may be difficult to find this information, or even learn that such information is available. Similarly, if the new immigrant has not been socialized to the importance of safety in vehicles for children, it may be very unlikely they will actively seek such information.

The findings indicated that the majority of parents reported wearing seatbelts all of the time in Beijing, China. It is internationally recognized that the use of seatbelts is a key measure in reducing the number of deaths in traffic crashes (WHO, 2004). Research indicates up to 70% of deaths from car crashes could be prevented if the occupants wore seatbelts. Observational studies have consistently found that children are more likely to be restrained when the driver is also restrained (Agran, Anderson, & Winn, 1998; Decina & Lococo, 2005; Glassbrenner, 2005; Gunn, Philippi, & Cooper, 2005). Increased driver seat belt use may be an important factor related to children's restraint use. Previous studies conducted in other cities in China found that despite the availability of seatbelts in almost all passenger cars in China, along with laws stipulating the use of seatbelts, seat belt use remains very low (Sina, 2006). This maybe because each city in China has its

own regulations related to seat belt use. A new traffic law that legislates the use of seat belts was launched in China in 2004, which requires drivers to wear seat belts during driving. The laws were enforced heavily in big cities, such as Beijing, Shanghai. In Beijing, if the driver dose not wear seat belt, 1 point will be lost and 50 Chinese dollars (around 7 dollars cdn) is the fine. Fifty Chinese dollars is not a big deal for those people who own a vehicle in China. However, a demerit point is usually considered a hardship since a driver will lose his licence when 12 demerit points are accumulated in one year.

A unique feature of this study was the involvement of fathers. Although most child seat safety studies sample mothers, as many fathers as mothers participated in this study. The active participation of fathers in this study may suggest that fathers assume the primary decision making role regarding transportation of children in China, which is consistent with family culture in China. According to an Internet survey conducted by an information consulting company, males play an important role when a family decides to buy a vehicle (Vehicle News China, 2006). The traditional vision of family life in China is one of a strong family unit led by the father and husband, who largely have absolute rule and control over family decisions. Much has changed today in the family make-up in China. The father still remains the strong family leader and decision maker. At a minimum, he influences the major decisions of the children and fathers always take the drivers role. In China, men have more responsibility for the family when compared to women, especially when dealing with the relationship between the family and social community they live in.

In addition to family roles, the findings of this study suggest that gender may influence parents' knowledge and behaviour regarding vehicle safety. Fathers in this

study whose child (ren) was less than 4 years old were more knowledgeable regarding CRDs than mothers. These findings may be important when tailoring education programs to learning styles of parents in order to enhance parents' knowledge which maybe different for mothers and fathers. Further research is necessary so that the interventions can be more directly tailored to both fathers and mothers to achieve the necessary consistency in safety practices for children traveling in vehicles.

By comparison, Chinese families in Canada did not demonstrate the same family role differences between fathers and mothers, even though both were equally represented in the study. In Canada, there was no significant difference between fathers and mothers frequency of transporting their children in Canada. For those families newly arrived to Canada, both parents reported taking equal responsibility for the child's safety in vehicles and for transporting children in vehicles.

Another important finding of the present study was the sources of information used by parents to support the proper use of child safety seats. Both groups rely on sources of information that are largely unprofessional. Parents reported relying heavily on "internet" and "media" in China, rather than physicians, nurses, or safety seat experts. Lack of access to consistent and accurate information may be a major contributing factor in the misuse of safety seats in Chinese families. Since families do not routinely access professional sources of information in China, it is possible they are simply not aware and not well informed about the importance of CRDs. Safety seats are also a very new concept in China which could be the direct result of the very rapid increase of vehicles in China in recent years.

Taxi also plays an important role in transportation in China. Taxi is one of the most easily accessible types of public transportation in Beijing. Taxis are the preferred choice for travelling in Beijing, and are fairly inexpensive. Currently, there are 70,000 taxis on the roads, thus it is very easy to hail a taxi anywhere in Beijing. Many parents who reported using safety seats for children in their own vehicle, do not do so when using taxies. With very frequent use of taxi, the difficulty for parents to set up car seats in taxies would not be feasible. And also for parents' friend and other family members, many parents mentioned that when using other transportation, car seats are rarely used for their children.

Findings related to Neuman's System Model

Health providers play an important role on how to increase the public awareness of children's safety in vehicles. According to the Neuman Systems Model, the most important first line of resistance for children traveling in vehicles is to protect them from the severe injuries associated with road crashes. Due to the very high prevalence of road crashes in China, this is a particularly important public health issue. This study offers important descriptive evidence to support the development of safety seat interventions for Chinese families. Before primary health promotion interventions can be developed, it is necessary to establish empirical evidence upon which to base interventions for these families. In this study, fathers who were more knowledgeable about child seat safety were also more likely to use safety seats for their children. Safety seat education programs will assume an important role in raising Chinese parent's awareness of the risk their children face in vehicles, and supporting these families to protect children from injury in vehicles. These findings may also provide an important foundation for policy

development regarding children's safety in vehicles and health promotion programs more generally aimed at injury prevention for children.

These findings are consistent with Neuman's system model, which postulates that a holistic systems approach is used to protect and promote client stability and, to do this one must strengthen the flexible line of defense (Neuman, 1995). Cleary, parents have a natural desire and responsibility to keep their children safe while traveling in vehicles in order to protect their child from injury. In order to accomplish this protective goal, parents must strive to provide a stable and safe environment for their children, particularly in vehicles. Before such interventions can be developed, an understanding of parents' knowledge and use of child safety systems must be empirically examined. The flexible line of defense represents the parents' knowledge and understanding of how to maintain a safe environment for their children by using correct CRD. This study provided some basic overview of what parents in China know and understand about the use of safety seats for their children and how this compares to parent's knowledge and use of safety seats for children from China living in Canada.

Directions for future research

Canada encourages multiculturalism. Future research may explore parent's beliefs, values and perception regarding child safety in vehicles in different cultures in order to support health care professionals to provide culturally sensitive intervention programs for people who come from different countries.

The findings from this study suggest that further investigation is necessary so that interventions can be more directly tailored to both fathers and mothers from China to achieve greater awareness and more effective use of safety seats for children traveling in

vehicles. For Canadian health providers, it is also important to them to understand that new Chinese immigrants, as well as other new immigrants may lack such knowledge, because of their culture and experiences in their home countries. Health education regarding booster seat use should be "boosted" or have greater emphasis in safety seat campaigns due to the widespread low rate of booster seat use in both China and Canada. . Health education for school aged children may also be an ideal opportunity to enhance both children's awareness and more indirectly their parents' awareness of safety seat use for their school aged children. Nurses in public health agencies and community health settings are ideally suited to engage in this population, as well as other new immigrants from other countries, in safety seat education in order to strengthen the first line of defense for children traveling in vehicles.

This study was limited to focusing on parents' knowledge as a protective line of defense for keeping their children safe in vehicles. Future research might extend this approach to examine the use of Neuman's model to focus on strengthening a child's flexible line of defense as well as their parents. The knowledge of CRD for school-aged children may influence parents' decisions regarding safety system use in vehicles. Future research may also examine and compare the knowledge and perception of both Chinese parents and school aged children of safety in vehicles, and how children may influence their parents' protective line of defense.

Significance

There is no known current or related data about Chinese parents and/or caregiver's knowledge, attitude, and use of safety seats for children traveling in vehicles. This study will is the first known study of this kind in China and may be a significant

contribution to primary and preventive injury prevention programs, health professionals, child passenger safety program evaluators and researchers, and nurses who care for families with children in China.

For Canadian health professionals, changing demographics as well as migration and immigration patterns require an enhanced ability to view health from a more global perspective. The ability to provide culturally relevant health care to clients, such as parents' education about child road safety, remains a challenge to Canada's health care system. This study offers a glimpse of insight into Chinese parents' understanding of child vehicle safety which may support health professionals here in Canada to provide more culturally sensitive health education to the Chinese immigrants, as well as other Asian immigrants.

Limitations

There are limitations in this study that need to be addressed in future research. The first limitation is that it is a convenience sample, and as a result generalizability is limited. In addition, this study was also limited to focusing on parents' knowledge as a protective line of defense for keeping their children safe in vehicles. Future research might extend this approach to examine the use of Neuman's model to focus on strengthening a child's flexible line of defense. Finally, parents who self select to participate in a child seat safety study may not be representative of the general population. Sampling in China at the retail centre for vehicles and vehicle related services may also have resulted in a selection effect of specific sector of population.

Implications to nursing

Due to the rapid growth of number of vehicles in China, there is an urgent need to implement evidence based road safety interventions in this country.

The study involving new immigrants from China to Canada, even though not generalizable, brings to light that child vehicle safety is not as highly valued in China as it is in Canada. Therefore, when developing injury prevention programs on child vehicle safety for this population, perhaps the value and awareness of safety first needs to be addressed from a cultural perspective. Education programs need to be developed that will educate the individuals in such a way that changes their perception and values about child vehicle safety.

Teaching safety skills to children can provide lifelong benefits to society. Experience in many countries has shown that reliance on individuals or organizations visiting schools to give talks on road safety are effective (Thomson, Tolmie, Foot, & Mclaren, 1996). Education programs regarding child vehicle safety for school-aged children may be a good way to enhance awareness of both children and their parents regarding CRD use both in China and Canada.

The results also raise the question of whether the style of education program should be different for men and women, or whether Chinese men see child safety as predominantly a father's role rather than mother's role to ensure their child is safe in vehicles. Findings in this study suggested that interventions to enhance parents' knowledge need to consider whether fathers and mothers have the same attitudes, motivation, and knowledge of vehicle safety or do they vary in terms of their gender role expectations and learning styles.

It is imperative that enhancing the public awareness of safety seat use in China, and knowledge regarding correct use of safety seats for children remain very important health challenges in both Canada and China.

While various professions are independently and collaboratively committed to promoting correct child restraint system (CRS) use for the shared goal of reducing these injuries and deaths, nurses are on the front line in dealing with the immediate and long-term consequences of motor vehicle injury and death in children. Nurses are also involved in injury prevention aimed at individuals, families, communities, regions, and nations. Nursing activities can include direct care or advocacy, program implementation and evaluation, and participation in the development of policy and legislation.

Nurses clearly have an extraordinary opportunity to take a leadership role, nationally and internationally, in championing injury-prevention initiatives for children traveling in vehicles.

Conclusion

On the basis of these findings, health education programs and legislative interventions related to CRD use are needed in China. Using age-appropriate CRD and transition times for effective use of CRD are important for Chinese parents. There is no CRD legislation in China right now, however, with the numbers of vehicles increasing in China, the issue of injury and deaths due to road crashes will likely increase in future. Increasing parents and public awareness of children's safety in vehicles are an important public health priority.

APPENDICES

APPENDIX A

Neuman's Systems Model

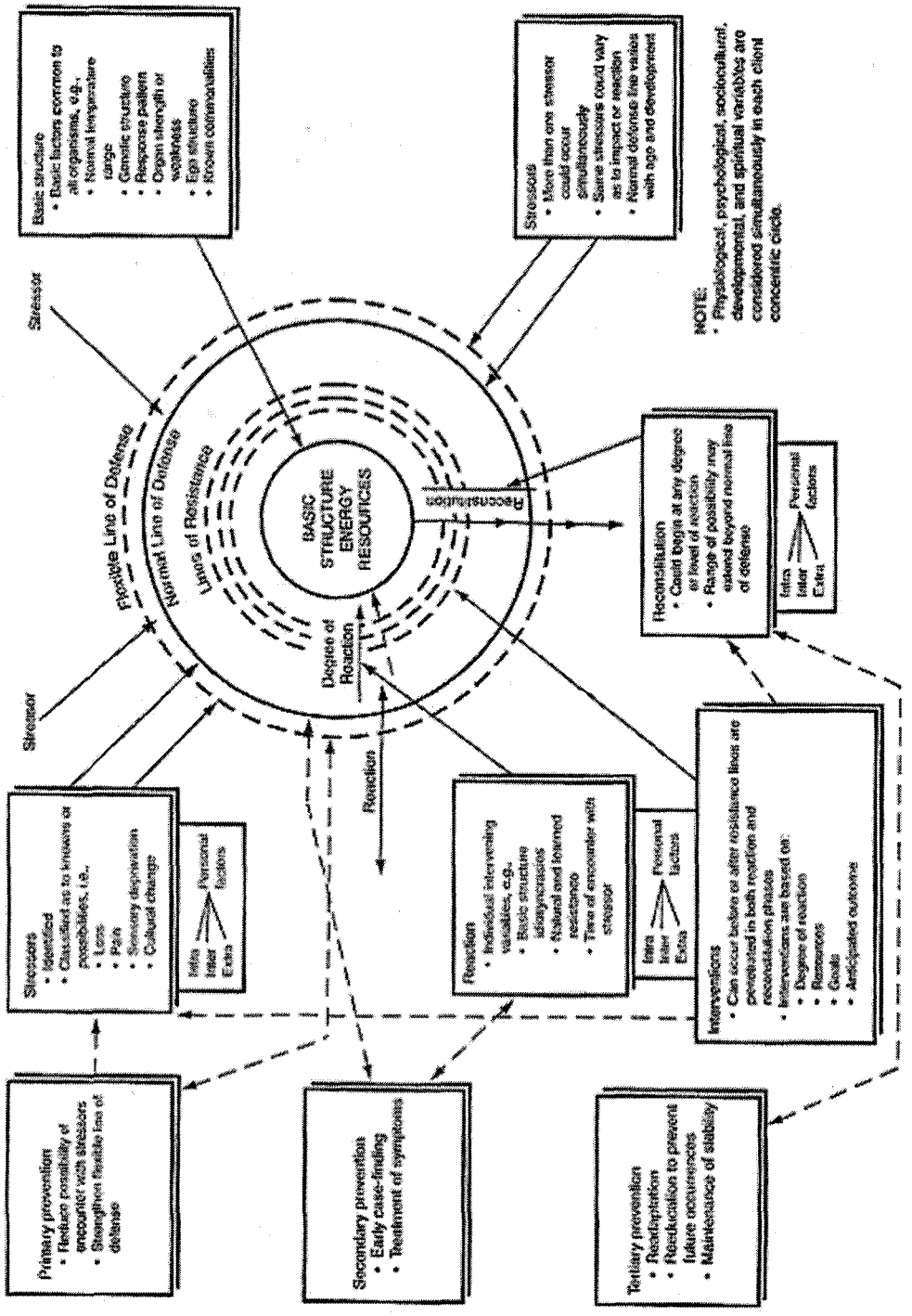


FIGURE The Neuman Systems Model. *(Original diagram copyright © 1970 by Betty Neuman.)*

APPENDIX B

Consent Form

UNIVERSITY OF WINDSOR

CONSENT TO PARTICIPATE IN RESEARCH

Title of Study: **Chinese Parents' Knowledge and Understanding of Vehicle Restraint Use for Their Children**

You are asked to participate in a research study conducted by Jianhua Ren from the Faculty of Nursing at the University of Windsor, Ontario, Canada. The results of this study will be contributed to the thesis requirements of a Master's of Science (Nursing) degree.

If you have any questions or concerns about the research, please feel to contact either Dr. Snowdon, Faculty Supervisor, at 519-253-3000 ext 4812, or Jianhua Ren at 519-253-4933.

PURPOSE OF THE STUDY
The purpose of this study is to learn the knowledge level of vehicle restraint among Chinese compared with the knowledge level of Chinese immigrants living in Canada.

PROCEDURES
If you volunteer to participate in this study, we would ask you to do the following things: Complete a self-administered questionnaire pertaining to car seat safety. The questionnaire will take approximately 15 minutes to complete.

POTENTIAL RISKS AND DISCOMFORTS
There are no physical risks for this study.

POTENTIAL BENEFITS TO SUBJECTS AND/OR TO SOCIETY
There are no individual financial benefits for participating in this research. However, subjects may experience satisfaction from knowing that the information provided would be used to develop educational programs, and nursing interventions for car seat safety.

PAYMENT FOR PARTICIPATION
There is no direct financial compensation to study participants.

CONFIDENTIALITY
Any information that is obtained in connection with this study and that can be identified with you will remain confidential and will be disclosed only with your permission.
Your name will not appear on the written data of the study, or in the reports of the study. Code numbers will appear on the study questionnaires. All the data will be kept in a locked cabinet in a secure office and will only be accessible to the researchers. Once the questionnaire data have been entered and analyzed the questionnaires will be destroyed. Only the coded data files will be kept for subsequent analysis by the researchers.

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 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 which warrant doing so.

FEEDBACK OF THE RESULTS OF THIS STUDY TO THE SUBJECTS
You may request a copy of the research results.

SUBSEQUENT USE OF DATA
This data will be used in subsequent studies by the research team.

RIGHTS OF RESEARCH SUBJECTS

You may withdraw your consent at any time and discontinue participation without penalty. If you have questions regarding your rights as a research subject, contact: Research Ethics Coordinator, University of Windsor, Windsor, Ontario N9B 3P4; telephone: 519-253-3000, ext. 3916; e-mail: lbunn@uwindsor.ca.

SIGNATURE OF RESEARCH SUBJECT/LEGAL REPRESENTATIVE

I understand the information provided for the study. 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 Subject

_____ _____

Signature of Subject Date

SIGNATURE OF INVESTIGATOR

These are the terms under which I will conduct research.

_____ _____

Signature of Investigator Date

APPENDIX C

Recruitment Advertisement

UNIVERSITY OF WINDSOR

Chinese Parents' Knowledge and Understanding of Vehicle Restraint Use for Their Children

One nursing master student fromUniversity of Windsor would like to speak with Chinese parents and Chinese immigrants living in Canada. We would like to know more about your knowledge and understanding of car seat safety. If you are interested in participating and are over the age of 18, please call.

This research study has received permission from the Research Ethics Board at the University of Windsor and the hospital. For more information please contact:

Ren Jianhua: (519) 253-4933

APPENDIX D

Letter of Information

LETTER OF INFORMATION FOR CONSENT TO PARTICIPATE IN RESEARCH

Title of Study: **Chinese Parents' Knowledge and Understanding of Vehicle Restraint Use for Their Children**

You are asked to participate in a research study conducted by Jianhua Ren, from the Faculty of Nursing at the University of Windsor under the supervisor of Dr. Anne Snowdon. The results of this study will contribute to the thesis requirements of a Master's of Science (Nursing) degree.

If you have any questions or concerns about the research, please feel to contact either Dr. Snowdon, Faculty Supervisor, at 519-253-3000 ext 4812, or Jianhua Ren at 519-253-4933.

PURPOSE OF THE STUDY

The purpose of this study is to learn the knowledge level of car seat safety among Chinese compared with the knowledge level of Chinese immigrants living in Canada.

PROCEDURES

If you volunteer to participate in this study, we would ask you to do the following things: Complete a self-administered questionnaire pertaining the car seat safety. The questionnaire will take approximately 15 minutes to complete.

POTENTIAL RISKS AND DISCOMFORTS

There are no physical risks for this study.

POTENTIAL BENEFITS TO SUBJECTS AND/OR TO SOCIETY

There are no individual financial benefits for participating in this research. However, subjects may experience satisfaction from knowing that the information provided would be used to develop educational programs, and nursing interventions for car seat safety.

PAYMENT FOR PARTICIPATION

There is no direct financial compensation to study participants.

CONFIDENTIALITY

Any information that is obtained in connection with this study and that can be identified with you will remain confidential and will be disclosed only with your permission. **Your name will not appear on the written data of the study, or in the reports of the study. Code numbers will appear on the study questionnaires. All the data will be kept in a locked cabinet in a secure office and will only be accessible to the researchers. Once the questionnaire data have been entered and analyzed the questionnaires will be destroyed. Only the coded data files will be kept for subsequent analysis by the researchers.**

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 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 which warrant doing so.

FEEDBACK OF THE RESULTS OF THIS STUDY TO THE SUBJECTS

You may request a copy of the research results.

SUBSEQUENT USE OF DATA

This data will be used in subsequent studies by the research team.

RIGHTS OF RESEARCH SUBJECTS

You may withdraw your consent at any time and discontinue participation without penalty. If you have questions regarding your rights as a research subject, contact: Research Ethics Coordinator, University of Windsor, Windsor, Ontario N9B 3P4; telephone: 519-253-3000, ext. 3916; e-mail: lbunn@uwindsor.ca.

SIGNATURE OF INVESTIGATOR

These are the terms under which I will conduct research.

_____ _____

Signature of Investigator Date

APPENDIX E

Self-Administered Questionnaire

Child vehicle safety—A survey of parents' knowledge and use ID#_____

Section 1: Knowledge of Child vehicle restraints

1. Do you use any restraint for your child in your vehicles? ☐ Yes ☐ No
2. Do you own a car seat? ☐ Yes ☐ No
3. How easy or difficult was it to find a car seat for your child? ☐ Easy ☐ some difficult ☐ Very difficult
4. If you use, what kind of restraint you use in the vehicle? (Check one box only)

☐ Child Seat Rear Facing ☐ Child Seat Forward Facing

☐ Booster Seat ☐ Seatbelt only

5. If you do not use restraint for your child in the vehicle, please indicate the reasons (multiple choices).
   - A. I do not think it is needed
   - B. I do not know where I can buy child seat
   - C. Nobody uses it
   - D. It is uncomfortable for the child
   - E. My child does not like it
   - F. The restraint is too expensive
   - G. Child seats are not required by law
   - H. I prefer to hold my child in a vehicle
   - I. Child seats not available
   - J. Too difficult to install or use in my vehicle
   - K. Other (pleases indicate _____)
6. Where does your child usually sit in the vehicle? ☐The front seat ☐ The back seats
7. Which one listed below do you think is the best way to protect an infant (<12 months old) in vehicle?
   - a. Holding in adults' arm
   - b. Sitting on adults laps
   - c. Child safety seats
   - d. Seatbelt + Child Seat
   - e. Seatbelt + Booster Seat
   - f. Air bag
   - g. Other (Please indicate_____)
8. Which one listed below do you think is the best way to protect child of 1-3 years old in vehicle?
   - a. Holding in adults' arm
   - b. Sitting on adults laps
   - c. Child safety seats
   - d. Seatbelt + Child Seat
   - e. Seatbelt + Booster Seat
   - f. Air bag
   - g. Other (Please indicate_____)
9. Which one list below do you think is the best way to protect child of 4-9 years old in vehicle?
   - a. Holding in adults' arm
   - b. Sitting on adults laps
   - c. Child safety seats
   - d. Seatbelt + Child Seat
   - e. Seatbelt + Booster Seat
   - f. Air bag
   - g. Other (Please indicate_____)

10. Your child uses a safety seat...

☐Never ☐Rarely ☐Sometimes ☐Often ☐Always

10a. if the safety seat is not always being used, please indicate the reasons (you may check more than one):

☐When transported by people other than his/her parents ☐ On short trips in the city
☐On short trips in the neighbourhood ☐ On the highway
☐When using another family vehicle ☐ Child uses a seat belt
☐Child seat is not available ☐ Do not think it is needed
☐Other _____-

11. What factors are important to you when you considering to purchase a car seat

a. Price (whether expensive)
b. Availability
c. Whether or not required by law
d. Other (please indicated_____)

12. Do you think price is a big issue for your buying the car safety seat for your child? ☐ No ☐ Yes

13. Do you think it should have the law for child vehicle safety in China? ☐ No ☐ Yes

Section 2: Vehicle information

The following questions will help determine where children sit in vehicles and what type of vehicles parents are driving.

1. In what type of vehicle do you most often transport your children?

☐ Sedan (4 door) ☐ Coupe (2 door) ☐ Minivan
☐ SUV (Sport Utility Vehicle) ☐ Pick-Up Truck ☐ Station Wagon
☐ Other _____

2. What is the make and model of this vehicle?_____

3. What year was this vehicle made? _____

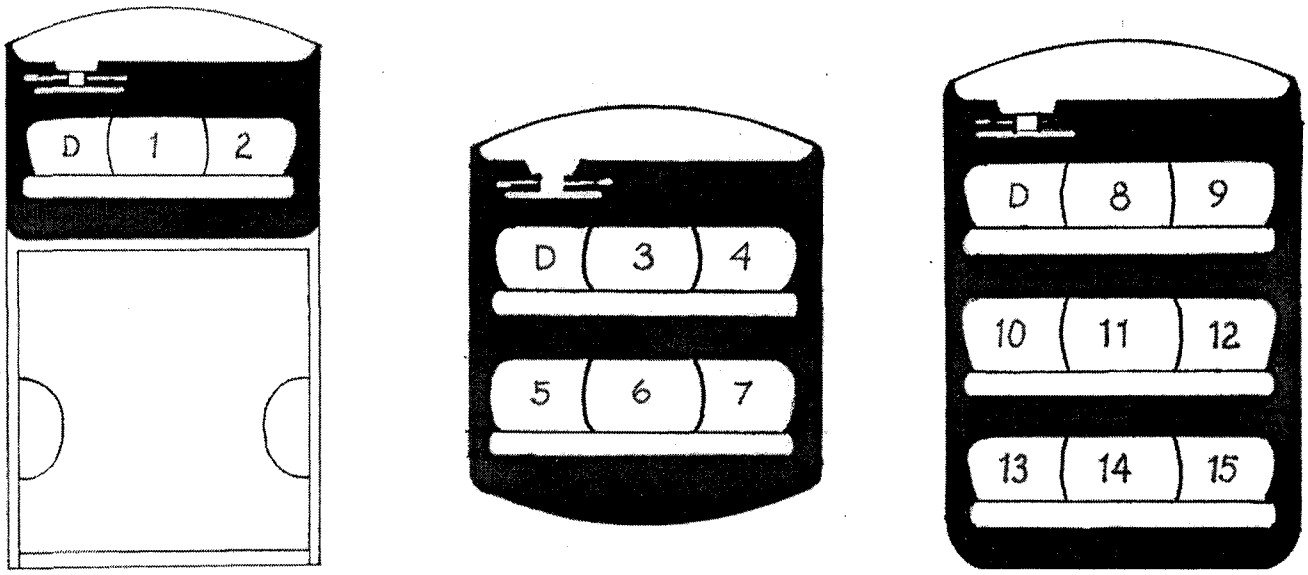
4. Does your vehicle have airbags? ☐ No ☐ Yes ☐ Not sure
If Yes, does your vehicle have: ☐ Driver air bags only
☐ Driver and front passenger air bags only
☐ Driver, front passenger and side impact air bags
☐ Don't know where it is

5. Dose your vehicle have seat belts: ☐ Yes
☐ No
☐ Don't know

6. Do you use a seatbelt when you drive? ☐ Never
☐ Rarely
☐ Sometimes
☐ Often
☐ Always

7. The pictures below (under the Roman Numerals) represent different types of vehicles **based on the number of rows of seats**. Please **circle** the picture below (I, II, or III) that corresponds to your vehicle.

I **II** **III**



8. On the pictures above, each seat position is labelled with a number. Vehicles often differ in the **number of seats per row**. On the picture you chose, please indicate which seats your vehicle is missing by placing an **X** through the corresponding position on the picture. **For example**, if your vehicle is missing the middle front seat place an **X** through the Number 1, 3, or 8 depending on which picture you circled.

9. Now, please indicate where your child usually sits in the vehicle by choosing the number of the seat.

Child is in Seat # _____

10. Does your child sit in the front seat...?

☐ Never ☐ Rarely ☐ Sometimes ☐ Often ☐ Always

If there are times when your **Child does** sit in the front seat, please indicate the reasons. You may check more than one reason.

☐ My vehicle has only one row of seats.
☐ My child won't sit anywhere else.
☐ My child sits in the front seat when I transport a lot of people.
☐ I let my child sit in the front seat as a reward.
☐ I like having my child sitting next to me.
☐ It is safe for child to sit in the front seat
☐ My child likes to sit in the front seat
☐ Other _____

Section 3: Child information

1. What is your Child's date of birth? (month/day/year) _____
2. What sex is Child? ☐ Male ☐ Female
3. What is Child's current height and weight?
   Height: _____ centimetres **Weight:** _____ kilograms

Section 4: Sources of Information

1. As a parent, do you seek information or assistance with car seat safety for children?
   ☐ Yes ☐ No

2. Did you receive any information about safety in vehicles? If so, where did you acquire this information? Please check all that apply.

☐ Family or friends ☐ Car Seat Clinic ☐ Internet ☐ Pamphlets Newspapers or magazines
☐ Hospital ☐ Prenatal classes ☐ Family doctor, paediatrician, public health nurse etc.
☐ Instructions on the box the seat comes in ☐ Car companies
☐ Some program or campaign _____
☐ Other _____

3. Please indicate on the scale below how easy it was for you to find information about the safe use of car seats.

Very Difficult	Difficult	Moderate	Easy	Very Easy
1	2	3	4	5

4. Do you want to get more information about child vehicle safety?
☐ Yes, I'd like to. ☐ No, I don't think I need. ☐ It doesn't matter

Section 5: Parent or Caregiver Information

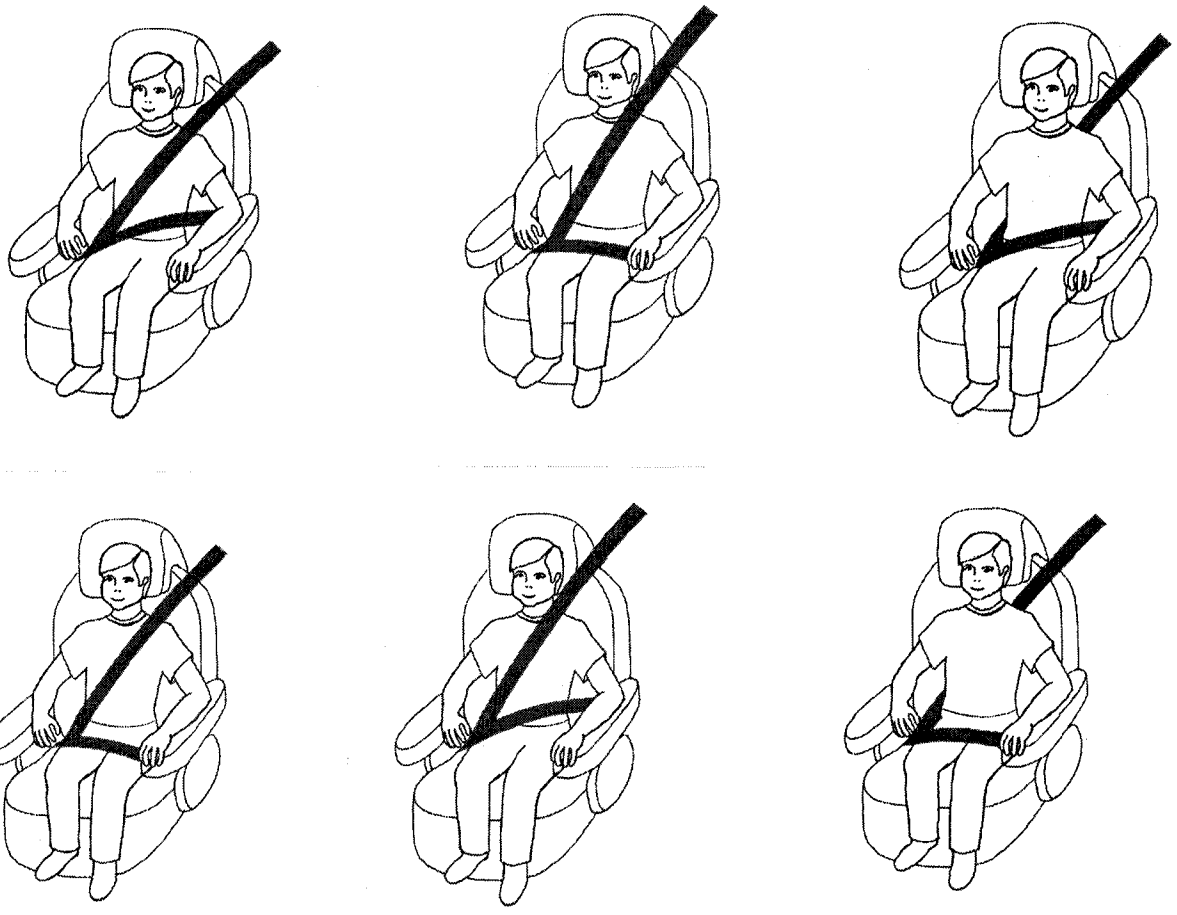
1. Today's date (month/day/year) _____
2. Your Age: _____
3. Sex: ☐ Male ☐ Female
4. Relationship to child: ☐ Mother ☐ Father ☐ Other _____
5. Marital status: ☐ Single ☐ Married/Common Law ☐ Separated/Divorced ☐ Widowed
6. Country of Birth _____
   If you were not born in China, how many years have you lived here? _____
7. what's your occupation? _____
8. Monthly Household Income:
   ☐ under $3000
   ☐ $3001-5000
   ☐ $5001-8000
   ☐ $8001-$10000
   ☐ $10001-$15000
   ☐ $15001-$20000
   ☐ Over $20000
9. Highest level of education completed:
   ☐ Grade school
   ☐ Some High School
   ☐ High School Graduate
   ☐ Some post-high school
   ☐ College Diploma/ Certificate
   ☐ University Degree
10. How many years have you been driving? _____
11. Your really driving experience:
☐ < 6 months ☐ 6-12months ☐ 1-3yrs
☐ 3-5 yrs ☐ 5-10 yrs ☐10 yrs
12. Did you receive your driver training in China? ☐ No ☐ Yes
    If No, where was it received? _____
13. How many times per week do you transport the child?
☐ less than once a week ☐ once per week ☐ two to three times per week
☐ four to six times per week ☐ every day

14. Who else transports your child in a vehicle?

☐ Friends ☐ Relatives ☐ Neighbor ☐Taxi driver

☐ Other _____

15. Please circle the illustration that shows the proper position of a seat belt on a child's body.



Thank you for completing this survey.

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