NURSE PRACTITIONER USE OF A FAMILY CENTERED CARE APPROACH TO MANAGE CHILDHOOD OBESITY IN THE PRIMARY HEALTH CARE SETTING

by

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Abstract

Childhood obesity rates are rising at an alarming rate. Obesity has a negative impact on health and well-being as well as social development. Obese children have a higher incidence of morbidity and mortality. Current clinical practice guidelines recommend practitioners use a family-centered approach to managing childhood obesity. The purpose of this project is to examine the use of a family-centered care (FCC) approach in managing childhood obesity in the primary health care setting and determine how best to incorporate it into managing childhood obesity in nurse practitioner (NP) practice. The principles of FCC are reviewed. NP use of existing nursing models such as the McGill model of nursing for guidance in incorporating family-centered care into practice is examined and discussed. The research obtained during the literature review indicates using a FCC approach to disease management is effective and can be achieved in the primary health care setting. As a result of the findings, a five step approach to assessing and managing childhood obesity is recommended for NPs practicing in the primary health care setting.
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**Glossary**

**Body Mass Index (BMI):** Body mass index (BMI) is a measure of body fat based on height and weight. BMI provides a reliable indicator of body fatness for most people and is used to screen for weight categories that may lead to health problems (Centers for Disease Control and Prevention [CDC] n.d.).

**Cholesterol:** A monohydric alcohol; a sterol widely distributed in animal tissues and occurring in egg yolks, oils, fats, the nerve tissue in the brain and spinal cord, the liver, kidneys, and the adrenal glands. In most individuals, elevated blood cholesterol levels increases the risk of developing coronary heart disease (CHD) and stroke (Taber & Thomas, 1997).

**Dyslipidemia:** Elevated total or low-density lipoprotein (LDL) cholesterol levels, or low levels of high-density lipoprotein (HDL) cholesterol. Dyslipidemia is an important risk factor for coronary heart disease (CHD) and stroke (Fodor, 2011).

**Energy expenditure:** Calories burned off in physical activity (Daniels et al., 2005).

**Energy intake:** Calories consumed in food and beverages (Daniels et al., 2005).

**Ethnicity:** Ethnicity is a term used to categorize populations on the basis of shared characteristics. These characteristics include culture, shared language, ancestry, religious tradition, dietary preferences and history. Although ethnic groups can share a range of phenotypic characteristics due to their shared ancestry, the term is typically used to highlight cultural and social characteristics instead of biological ones (Caprio et al., 2008).

**Family centered care:** A way of caring for children and their families within health services which ensures that care is planned around the whole family, not just the individual child/person, and in which all the family members are recognized as care recipients (Shields, Pratt & Hunter 2006).
**Globesity:** A swelling global tidal wave of obesity and diet-related diseases (World Health Organization [WHO], 2011).

**Hepatic Steatosis:** The initial stage of non-alcoholic fatty liver disease (NAFLD): one of the most important effects caused by obesity on children and adolescents' health (Duarte & Silva, 2011).

**Hyperglycemia:** Increased blood sugar, as in diabetes (Taber & Thomas, 1997).

**Hyperlipidemia:** An increase of lipids [fats] in the blood (Taber & Thomas, 1997).

**Hypertension:** A condition in which the patient has a higher than normal blood pressure (Taber & Thomas, 1997).

**Morbidity:** 1: State of being diseased. 2. The number of sick persons or cases of disease in relationship to a specific population (Taber & Thomas, 1997).

**Mortality:** The death rate; the ratio of the number of deaths to a given population (Taber & Thomas, 1997)

**Nurse practitioner:** Nurse practitioners are health professionals who have achieved the advanced nursing practice competencies at the graduate level of nursing education that are required for registration as a nurse practitioner with CRNBC. Nurse practitioners provide health care services from a holistic nursing perspective, integrated with the autonomous diagnosis and treatment of acute and chronic illnesses, including prescribing medications (CRNBC, 2011).

**Overweight:** Children with a BMI that is ($\geq$ 85th to $< 95^{th}$ percentile) when plotted on the growth charts of the US Centers for Disease Control and Prevention (CDC). Charts can be accessed from: http://www.cdc.gov/growthcharts/clinical_charts.htm#Set1)
Obesity: Children with a BMI that is (≥95th percentile) when plotted on the growth charts of the US Centers for Disease Control and Prevention (CDC). (Charts can be accessed from: http://www.cdc.gov/growthcharts/clinical.charts.htm#Set1).

Primary health care: Primary health care refers to an approach to health and a spectrum of services beyond the traditional health care system. It includes all services that play a part in health, such as income, housing, education, and environment. Primary care is the element within primary health care that focuses on health care services, including health promotion, illness and injury prevention, and the diagnosis and treatment of illness and injury. Primary care serves a dual function in the Canadian health care system: direct provision of first-contact services (by providers such as family physicians, nurse practitioners, pharmacists, and telephone advice lines); and a coordination function to ensure continuity and ease of movement across the system, so that care remains integrated when Canadians require more specialized services (with specialists or in hospitals, for example) (Health Canada, n.d.).

Primary care provider (PCP): Primary care providers are health professionals who take primary responsibility for an established group of patients for whom they provide longitudinal person-focused care; comprehensive care for most health needs; first contact assessment for new health care need and referral and coordination of care when it must be sought elsewhere. A primary care provider is ideally chosen by an individual to serve as his or her health care professional to address a wide variety of health issues including health promotion, illness and injury prevention, and the diagnosis and treatment of illness and injury (CRNBC, 2010).

Social Determinants of Health: The social determinants of health are the conditions in which people are born, grow, live, work and age, including the health system. They are shaped by the distribution of money, power and resources at global, national and local levels which are influenced by policy choices. The social determinants of health are mostly responsible for health
inequities – the unfair and avoidable differences in health status seen within and between countries (WHO, 2011).
Chapter One

Obesity can be defined simply as “the result of an energy imbalance” (Canadian Medical Association [CMA], 2006; Registered Nurses Association of Ontario [RNAO], 2005), this means that obesity and overweight occur when energy intake exceeds energy expenditure. For a problem that seems to have such a logical explanation it stands to reason that the successful treatment of obesity would amount to a simple rebalancing of the energy equation at the individual level: fewer calories consumed and more energy expended. However, the reality of obesity is much more complex and multifactoral. Obesity is a chronic condition caused by long term positive energy balance and is influenced by social, environmental and genetic factors. It can also result from pathology in the metabolic feedback between energy intake, and expenditure (Daniels et al., 2005).

Obesity affects all races, all ages, and is a global epidemic. Once considered a problem in high income countries, overweight and obesity are now on the rise in low and middle-income countries, particularly in urban settings. According to the World Health Organization (WHO) (2011) worldwide obesity has more than doubled since 1980. In 2008, 1.5 billion adults, 20 and older, were overweight. In 2010 nearly 43 million children under the age of five were overweight. Close to 35 million overweight children are living in developing countries and eight million in developed countries (p. 1).

The World Health Organization (WHO) has labelled this epidemic “globesity” (WHO, n.d.). In Canada in 2007, the self-reported rate of adult obesity (age 18+) was 17%; researchers estimate that the actual rate of obesity is likely much higher, closer to 25% (Public Health Agency of Canada [PHAC], 2009). Obesity has developed into a leading cause of morbidity and mortality worldwide (Maziak, Ward, & Stockton, 2007). Between 1985- 2000, over 57,000 deaths in Canada were attributed to overweight and obesity (Katzmarzyk & Ardern, 2004).
Perhaps even more alarming than the staggering rates of obesity among Canadian adults is the strong evidence showing that the prevalence of overweight and obesity among Canadian children and adolescents is increasing more rapidly than in the adult population (Willms, Tremblay, & Katzmarzyk, 2003). In 2004, 26% of Canadian children and adolescents were considered overweight; 8% were obese. Increases in overweight and obesity rates over the past 25 years in Canada have been notable. During this time the number of adolescents considered overweight has more than doubled, and the obesity rate among adolescents has tripled (Shields, 2005).

The seriousness of childhood obesity is related to its association with major health risks: breathing difficulties, increased risk of fracture, hypertension, early markers of cardiovascular disease, insulin resistance, and metabolic syndrome (Biro & Wien, 2010). Childhood obesity negatively influences children’s quality of life impacting their physical, social and psychological functioning (Maziak et al., 2007). Childhood obesity is also associated with a higher risk of adult obesity, certain cancers, disability and premature death in adulthood, and is now the leading cause of morbidity and mortality worldwide (World Health Organization [WHO], 2011).

**Impact of Obesity on Health and Well-Being**

The rising rates of childhood obesity in Canada and worldwide are of major concern due to the immediate and long term health consequences associated with childhood obesity (Jonides, Buschbacher, & Barlow, 2004). Experts in the field of childhood obesity warn that children will have a shorter lifespan than their parents if current practices aimed at the prevention and treatment of childhood obesity fail (Davis et al., 2007; Hopkins, DeCristofaro, & Elliott, 2011). Obese children are developing the same complications as obese adults long before they reach adulthood. In a population-based study of obese children conducted by Freedman, Dietz,
Srinivasan, and Berenson (1999), approximately 60% of those studied had at least one risk factor for cardiovascular disease (hyperlipidemia, insulin resistance, or elevated blood pressure) and 25% had two or more such risk factors. Obese children are also at risk for developing type 2 diabetes, a disease previously thought of as only occurring in adults (Arslanian, 2002). Early-onset type 2 diabetes in children is associated with severe and early onset microvascular complications including nephropathy, retinopathy and neuropathy. These irreversible microvascular complications can lead to renal failure, vision impairment and blindness and eventually premature death (Eppens et al., 2006; Krakoff et al., 2003).

Childhood obesity increases the overall risk for morbidity and early mortality (Katzmarzyk, Janssen, & Ardern, 2003; Must & Strauss, 1999). Obese children are also at risk of becoming overweight adults and the presence of obesity during adolescence is the best single predictor of adult obesity (Dietz & Gortmaker, 2001). Freedman et al. (2005) found that childhood BMI is associated with adult adiposity and that the magnitude of this association depended on the relative fatness of children: the greater the BMI, the greater the risk of adult obesity. The risks of obesity related morbidity and mortality only increase as overweight and obese children reach adulthood, as obesity is also associated with metabolic syndrome, osteoarthritis, certain cancers and left ventricular hypertrophy (Hopkins et al., 2011; Institute of Medicine [IOM], 2004).

**Social impact.**

Childhood obesity can negatively impact social, academic, and economic outcomes in childhood and adulthood (Gortmaker, Must, Perrin, Sobol, & Dietz, 1993). Maziak et al. (2007) explain that children are not equipped to handle the prejudice and stereotyping associated with obesity and are at risk of developing serious social and emotional health consequences related to
their weight status. Negative behaviors such as anger, depression, and suicidal ideation have been noted (Carpenter, Hasin, Allison, & Faith, 2000). There is significant stigma associated with being obese that can lead to shame, self-blame, and low self-esteem. This stigma can negatively affect academic performance, socialization and employment opportunities into adulthood (IOM, 2004; Lobstein, Baur & Uauy, 2004). Severely obese children and adolescents have reported a low health related quality of life, equal to that of children with cancer (Hopkins et al., 2011; Lee, 2007).

The Role of the Nurse Practitioner

Seal (2011) states the “global epidemic of obesity in children and adults is one of the greatest challenges in public health today.” The myriad of factors that contribute to obesity makes the prevention and treatment of obesity especially challenging (p. 65). Nurse practitioners (NPs) working in primary health care settings in Canada can play a crucial role in the fight against childhood obesity as “each healthcare encounter with children or adolescents and their parent/guardian inherently provides an opportunity for NPs to screen for evidence of risk factors, overweight status or sequelae to overweight” (McAdams 2011, p.463). Wald, Moyer, Eickhoff, and Ewing (2011) suggest children are more likely to visit to primary health care clinics during childhood for well child exams and for common childhood illnesses. This provides NPs the opportunity to recognize obesity and intervene early on, and early intervention is more likely to result in long term change.

A recent study published by the Organisation for Economic Co-operation and Development (OECD) found that one in four Canadian children are overweight, which is among the highest rates in developed countries. The Health at a Glance report, which combines health statistics from 34 OECD countries to give a comparative picture of health care systems around
the world, showed only Italy and the United States scored higher on the childhood obesity index (OECD, 2011). Primary health care providers will be seeing more overweight and obese children in practice. Thus an understanding of the factors that influence obesity, why it is important to address and how childhood obesity can be effectively managed in family practice is necessary.

Current NP literature (Hopkins et al., 2011) advocates the use of family based intervention to address childhood obesity however, there are no clear guidelines that support the implementation of family centered care or NP use of a holistic family centered approach in managing childhood obesity.

**Purpose**

The purpose of this project is to examine the use of a family centered care approach in managing childhood obesity in the primary health care setting and determine how best to incorporate FCC into managing childhood obesity in FNP practice. The following question of inquiry was used as a guide in completing this project: “How can the nurse practitioner incorporate family centered care into practice in the assessment and management of childhood obesity in the primary health care setting?” The question was answered through an integrative review of the literature on family centered care and childhood obesity.

Chapter Two provides background data on obesity as a global epidemic. It also examines the physiology, pathophysiology and more specifically the effects of obesity on the health and well being of children and youth ages 6 to 18. It describes the role of the NP in Canada and introduces family centered care. It also looks at the McGill Model of Nursing as a framework to assist practitioners to incorporate FCC into practice. Chapter Three outlines the approach to the project and research methods. In Chapter Four the literature is critically analysed. This chapter examines the use of FCC in managing childhood obesity in the primary health care setting. In
Chapter Five analysis of the literature will be disseminated with regards to how NPs can draw on the principles of FCC and the McGill Model when managing childhood obesity in primary care settings. Areas for further research and study are also reviewed. Finally, specific recommendations for nurse practitioner practice are provided.
Chapter Two

Background and Context

The Complexity of Childhood Obesity

Rapidly rising rates of childhood obesity cannot be reduced to the simple equation of “too much food, not enough activity” theory (Swinburn & Egger, 2004). In reality, there are a myriad of factors that influence the development of obesity in the pediatric population. While increased caloric intake and decreased energy expenditure are major contributors other factors include genetic, behavioral, social, psychological, technological, environmental, economic, and cultural (PHAC, 2011). As researchers continue to study obesity, it will be necessary for primary health care providers to remain aware of current and emerging literature regarding the prevention and management of childhood obesity.

Classification of Overweight and Obesity in Children

Current Canadian clinical practice guidelines on the management and prevention of obesity in adults and children (CMA, 2006) recommend measuring body mass index (BMI; weight in kilograms divided by height in metres squared) in all children and adolescents (aged 2 years and older). They also recommend using the growth charts of the US Centers for Disease Control and Prevention (CDC) for BMI to screen children and adolescents for overweight. Once BMI is determined it is plotted on the appropriate CDC growth chart. Overweight is defined as a BMI that when plotted on the growth chart is ≥85th to < 95th percentile. Obesity is ≥95th percentile (p. 6)

Percentiles are measurements that show where a child is compared with others. On the CDC growth charts, the percentiles are shown as lines drawn in curved patterns. When a child's BMI is plotted on the chart, the measurements land on a percentile line. The higher the percentile
number, the bigger a child is compared with other children of the same age and gender. The lower the percentile number, the smaller the child is. For example, if an 8-year-old boy's BMI is in the 10th percentile it means that 10% of boys that age weigh less than he does and 90% of 8-year-old boys weigh more.

There has been some debate as to whether or not these growth charts were appropriate for use in Canadian aboriginal populations. Currently the CDC promotes one set of growth charts for all racial and ethnic groups. The Canadian Paediatric Society (Canadian Paediatric Society [CPS], 2004) does not recommend the use of racial and ethnic charts because studies support the premise that the differences in growth among children of various racial and ethnic groups are the result of environmental rather than genetic influences (p. 478).

**Risk Factors for the Development of Childhood Obesity**

**Genetic and biologic.**

The risk of obesity is increased when an individual has relatives who are obese. When one parent is obese the risk of obesity in their children increases three-fold; if both parents are obese the risk increases by ten times or greater (Dietz 1998; Ogden et al., 2006; Whitaker, Wright, Pepe, Seidel, & Dietz, 1997). Obesity is “not inherited in families in a predictable pattern like other genetic diseases, such as cystic fibrosis, but rather demonstrates a complex “polygenic” pattern, meaning that multiple genes are involved” (Seal, 2011). Seal (2011) further suggests that although each of the obesity genes has only a marginal affect on commonly measured obesity related phenotypes (BMI, waist circumference, percentage fat mass, and body weight) collectively they play a major role in determining how an individual responds to environmental factors such as nutrition and physical activity (p. 63).
Other biologic factors found to be involved in the regulation of food intake and thus obesity include leptin (LEP), LEPR, ghrelin, pro-opiomelanocortin (POMC), MC4R, and the enzyme pro-hormone convertase-1 (PC1) (Seal, 2011).

Banning (2005) describes leptin as a hormone produced by adipose tissue that modifies the function of cerebral nerve cells. Leptin regulates a broad variety of processes and behaviours such as blood pressure, bone mass, fat cells, muscle cells and immune function as well as regulating multiple intracellular signalling mechanisms which are thought to be associated with leptin resistance and obesity. The genes PMO and POMC have both been associated with the onset of obesity although the related mechanism and trigger are unclear (p. 164).

Ghrelin is a hormone that has been recognized as having a major influence on energy balance (Klok, Jakobsdottir, & Drent, 2006). Ghrelin is secreted by the stomach, gastrointestinal tract, pancreas, ovaries, and adrenal cortex. It is also secreted in the brain (page 24). Ghrelin is a fast acting hormone that signals the hypothalamus when an increase in metabolic efficiency is necessary. Research conducted by Cummings, Frayo, Marmonier, Aubert, and Chapelot (2006) showed that increases in ghrelin levels before meals correlated with increased hunger scores in healthy humans. This occurred regardless of usual consumption patterns and food related cues. They concluded that ghrelin seems to function as a meal initiation signal for short term regulation of energy balance.

Insulin is a hormone secreted by the pancreas in response to high levels of blood glucose. Higher levels of circulating insulin signal the body’s cells to absorb glucose. Insulin and specifically insulin resistance plays a role in obesity (Chiarelli & Marcovecchio, 2008). Insulin resistance is a state in which a specific amount of insulin produces an inadequate biological response. It is characterized by a decrease in the ability of insulin to stimulate the uptake and use
of glucose by muscle and adipose tissue and to suppress hepatic glucose production and output (page S69). The development of insulin resistance is believed to be influenced by both genetic and environmental factors including obesity, ethnicity, gender, perinatal factors, puberty, sedentary lifestyle and diet (p. S69). Insulin resistance in obesity is related to the development of hypertension, dyslipidemia, impaired glucose tolerance, and hepatic steatosis. It is also related to higher lipolytic activity of visceral fat when compared with subcutaneous or total body fat. The combination of these factors is called metabolic syndrome (p. S70). Insulin resistance in childhood obesity is the best predictor for the development of impaired glucose tolerance and type 2 diabetes mellitus, a progressive disease with a gradual increase in insulin resistance associated later with a decline in insulin secretion with fasting hyperglycemia (Chiarelli & Marcovecchio, 2008).

Stress is also linked to obesity. In obesity, cortisol levels are abnormally elevated. Maglione-Garves, Kravitz, and Schneider (2005) describe cortisol as a steroid hormone that is produced in the adrenal cortex. Cortisol production is a normal metabolic process. Fasting, food intake, exercise, awakening, and psychological stressors all cause the body to release cortisol. Energy regulation and mobilization are the two most critical functions of cortisol. Cortisol regulates energy by selecting the right type and amount of stored energy in the form of carbohydrate, fat or protein that is needed by the body to meet physiological demand. Cortisol mobilizes energy by moving the body's stored fats triglycerides, from one location to another or delivering it to working tissues such as muscle. Under extreme stress cortisol can provide the body with protein for energy through glucogenesis, the process of converting amino acids into useable carbohydrate (glucose) in the liver. Chronic stress causes body tissues to be exposed to high levels of cortisol for extended periods of time. This leads to the relocation of fat stores and
excess circulating fat to be relocated and deposited deep in the abdomen, which can lead to the development of hypertension, hyperlipidemia, and hyperglycemia (p.22). Cortisol aids immature fat cells to grow into mature fat cells. Cortisol may also act as an anti-inflammatory agent, suppressing the immune system during times of physical and psychological stress (p 21).

Children who are overweight have a greater stress-elicited change in cortisol secretion than individuals of normal weight (page 345). The research regarding cortisol levels and childhood obesity is still preliminary, however current findings support the significance of psychological stress as a potential contributor to childhood obesity (Dockray, Susman, & Dorn, 2009; Gunderson, Mahatmya, Garasky, & Lohman, 2010; Koch, Sepa, & Ludvigsson, 2008).

**Sleep disturbances.**

Sleep deprivation and short sleep duration may increase the risk of obesity in children and adolescents (Bell & Zimmerman, 2010; Canadian Obesity Network [CON], n.d.). Both insulin and glucose metabolism are negatively affected by lack of sleep resulting in slower glucose clearance, lower insulin response to glucose, a lower disposition index and lower insulin sensitivity. Sleep deprivation also results in lower levels of leptin and higher overall levels of ghrelin. It has an effect on what people are hungry for and the amount that they consume. Sleep deprivation causes people to become hungry for fatter and more calorically dense foods which can lead to weight gain and obesity (CON, n.d.). Sleep deprivation also affects cortisol levels, which have also been shown to be higher in sleep-deprived persons (Bell & Zimmerman, 2010; CON, n.d.).

Obesity itself also contributes to sleep dysfunction. Many obese children develop sleep apnea, a condition in which sleep is disrupted by irregular breathing patterns. When obese children develop sleep apnea they have fragmented sleep causing secondary sleep deprivation.
This occurs as a result of constant waking during the night due to ineffective oxygenation. For obese children, the risk of sleep apnea increases by 12 percent for each kg/m² increase in BMI (CON, n.d.).

**Ethnicity.**

The prevalence of obesity varies across ethnic groups in Canada with the lowest prevalence amongst East–Southeast Asians, while Aboriginal Canadians living off the reserve have the highest prevalence (Katzmarzyk, 2008). In Canada, 41% of young people of Aboriginal origin living off reserve are overweight or obese (Katzmarzyk, 2008; Tjepkema, 2002). Data collected in the First Nations Regional Longitudinal Health Survey (2003) found the prevalence of obesity is also particularly high among on-reserve First Nations children: 36.2% of children (age 2-11) and 14.0% of youth (age 12-17) were considered obese (Sheilds, 2005). High obesity rates among First Nations people have both genetic and environmental roots. Aboriginal people have a genetic make-up that made energy storage a priority which was ideal in their ancestors’ feast-famine environment. However, in today’s ‘feast-feast’ environment, the body stores energy as fat and puts this population at high risk of obesity and related disease, such as diabetes. Loss of traditional lifestyles and lack of access to affordable healthy food choices also exacerbate the problem (Harris et al., 2011).

**Social determinants of health.**

Swinburn et al., (2011) state the most obvious social determinant of health (SODH) for a population to develop obesity is sufficient wealth. They also point out that although increasing wealth enables obesity the level of prosperity does not have to be high for obesity to manifest. Economic prosperity brings with it several transitions: a changing demographic from younger to older population distribution, rural to urban dwelling, fewer infectious diseases, more non
communicable diseases, low to high mechanization and motorization, and a change in diet from traditional foods to more processed energy dense foods (p. 806). These changes eventually lead to the development of the obesogenic environment such the one we are living in with the developed world.

As Golan and Crow (2004) explain, an “obesogenic environment [is one] that idealizes thinness and stigmatizes fatness, but paradoxically encourages excess food intake and quick approaches to weight loss”. Other contributing factors are children and their families living sedentary or less active lifestyles, overeating, and consuming high-fat, high-calorie foods (Golan & Crow 2004; Kamanyika, Jeffery, Morabia, Ritenbaugh, & Antipatis, 2002; Lobstein et al., 2004; Young & Nestle, 2002).

Out of the global context and within developed countries the relationship between income and obesity changes dramatically and an inverse relationship between wealth and obesity exists. As wealth and levels of education increase, obesity levels decrease. Low socioeconomic status and low levels of education negatively influence a variety of the SDOH that contribute to obesity in children and adolescents including eating and physical activity behaviours, neighbourhood safety, local schools and resources, local food stores offering healthy food choices, cost of food, screen time and other sedentary activities, and access to exercise facilities (McAdams, 2010).

In Canada the influence of socio-economic status is clear. For example, young people in households where no members had more than a high school diploma were more likely to be overweight/obese than were those in households where the highest level of education was post-secondary graduation. The prevalence of poor health or unhealthy behaviours is less common at every step up the socio-economic scale (PHAC, 2011). Current NP literature recommends targeting environmental influences on the risk factors for childhood obesity is critical in obesity
management strategies and suggests a “thorough knowledge of the factors that impact the environment associated with overweight in children and adolescents will augment the holistic, ecological perspective” (McAdams, 2010, p. 466).

Genetics and SDOH play a large role in the rising rates of childhood obesity, but there are other contributing factors. Researchers have found other modifiable and non-modifiable factors that may contribute to the development of the disease. These risk factors for childhood obesity include: gestational diabetes, maternal smoking during pregnancy, fetal growth retardation, and bottle-feeding of infant formula (Hopkins et al., 2011; RNAO, 2005).

Brophy et al. (2009) suggests infant feeding influences the development of childhood obesity (p. 467). Breastfeeding of infants has been found to be protective factor against the development of childhood obesity as breastfed babies seem to be better able to regulate their food intake and thus are at lower risk for obesity in later life (Moreno, 2011; Twells & Newhook, 2010). Both the WHO and PHAC recommend exclusive breastfeeding of infants for the first six months of life because “it provides all the nutrients, growth factors and immunological components a healthy full term infant needs” (WHO, 2004).

A study conducted by Brophy et al. (2009) found that feeding solids before 3 months of age is associated with higher BMI/obesity at age 5 and subsequent unhealthy feeding behaviour. Currently the PHAC recommends solid foods be introduced in the infant’s diet beginning at six months of age. Delaying the introduction of solid foods may be protective against the development of childhood obesity in later childhood (p. 472). Clearly childhood obesity is complex with multiple contributing factors including biologic, quality of sleep, ethnicity, and SODH. The complexity of this issue poses a challenge for NPs working with obese children and their families in primary health care settings.
The Role of the Nurse Practitioner in Childhood Obesity Management

The trend toward incorporating NPs into primary health care is not a new phenomenon and has been evolving over the past several decades (Browne & Tarlier, 2008). Browne and Tarlier (2008) describe NPs as nurses educated at an advanced level, typically a Master’s degree in nursing and as having scope of practice that incorporates activities that were traditionally undertaken exclusively by physicians including diagnosing, prescribing medication, referring patients to other professionals. NP’s provide a direct point of entry to the healthcare system for case management, as well as diagnose, treat, advocate health prevention and promotion (p. 83).

In Canada, integrating NPs into the health care system has been proposed as a key strategy in reducing healthcare costs and increasing healthcare access (Gould & Wasylkiw, 2006; Laurant et al., 2004; Nurse Practitioner Association of Ontario [NPAO], 2006). Since the introduction of NPs into the Canadian healthcare system in the 1970’s, Browne and Tarlier (2008) state the “trend towards preparing, recognizing and valuing NPs as autonomous healthcare providers [has] continue[d] to gain steady momentum” (p. 84).

NPs registered as family or primary health care NPs typically work in community settings such as community health centres, primary care offices, and long term care facilities and focus on health promotion, preventive care, diagnosis and treatment of acute illnesses and injuries, and monitoring and management of chronic diseases. NPs also provide advanced nursing care in acute care settings for patients are acutely, critically or chronically ill with complex conditions in clinical areas such as emergency, oncology, and cardiology (Dicenso & Bryant-Lukosius, 2010).

Nurse practitioners work as autonomous health care providers. They provide many of the same health care services as their physician colleagues. The role of the NP is not to replace the
family physician rather to collaborate with allied health care to increase access to healthcare for all patients. Although NPs practice diagnosis and prescribe treatments using the medical model as a framework they are different from family physician in that their nursing education has a unique theoretical foundation from that of other health professions. NP's are first and foremost nurses. Nurses “view the world and their role in it from a theoretical perspective that is built on four fundamental concepts: person or client, the environment, health and nursing” (Kozier et al., 2004). The person or client who receives care from a nurse may be an individual, family group, community or population. Nurses take into consideration the environment and both the social and physical factors that may affect the client (Thorne, 2003). Nurses focus on health, which has many facets including degree of wellness, well-being and quality of life that the client experiences. Nurses are also concerned with the broader determinants of health including economic, social and environmental conditions that influence the health of individuals, communities and jurisdictions as a whole (CNA, 2007). Caring for families has long been inherent in nursing practise. A background in nursing combined with newly obtained knowledge and skills make NPs well suited to provide family centered care.

Family Centered Care

Family centered care promotes and supports the well-being and health of families and family members in different phases of life. NPs have the opportunity to use a family nursing approach to help families manage their resources and cope with different health problems. In family nursing individuals are considered independent and yet part of a family unit. Using a family centered approach the nurse regards the whole family as clients. Establishing goals and promoting health means involving the entire family (Haggman-Laitila, Tanninen, & Pietila, 2010). Key principles of family centered care are outlined in Table 1.
Table 1

*Key Principles of Family Centered Care*

1. Acknowledges the family as the constant in a child’s life
2. Builds on family strengths
3. Supports the child in learning about and participating in his/her care and decision making
4. Honours cultural diversity and family traditions
5. Recognizes the importance of community-based services
6. Promotes an individual and developmental approach
7. Encourages family-to-family and peer support
8. Supports youth as they transition to adulthood
9. Develops policies, practices, and systems that are family-friendly and family centered in all settings
10. Celebrates successes

Adapted from: Arango, (2011)

The core concept of FCC is the creation of a partnership in which families and practitioners work together for the child. It is “a way of caring for children and their families within health services which ensures that care is planned around the whole family, not just the individual child/person, and in which all the family members are recognized as care recipients” (Sheilds et al., 2006). Arango (2011) describes FCC as assuring “the health and well-being of children and their families through a respectful family-professional partnership; [FCC] honours the strengths, cultures, traditions and expertise that everyone brings to this relationship” (p. 97). For the family/practitioner partnership to succeed each member is expected to respect the skills and expertise the other partners bring to the relationship. Arango (2011) describes the FCC relationship as based upon trust, open communication, mutual decision making and a willingness to negotiate as needed (p 97). Further, participation in FCC is reported to be a positive
experience for families as FCC is associated with improved access to health care, higher satisfaction, more appropriate utilization of services, and improved health and functional status (p. 97).

Family centered care one important concept in the management of childhood obesity because it has been shown to result in sustained weight loss in children over time while improving the health and well being of the entire family. Family based management strategies are recommended in current evidence based guidelines regarding childhood obesity (Berry et al., 2004). NPs can take advantage of their nursing knowledge and look to existing nursing models such as the McGill Model of Nursing for guidance in incorporating family centered care into practice. The McGill Model includes many of the elements of family centered care as described by Arango and incorporates other factors that influence health such as environment and SDOH. Because of this, it can be utilized by NPs to manage childhood obesity in primary health care settings.

McGill Model of Nursing

The McGill Model of Nursing was developed at the McGill School of Nursing under the guidance of Dr. Moyra Allen. Dr. Allen envisioned nurses taking a unique, active and complementary role in providing health care. Gottlieb and Rowat (1987) describe that within the model:

The central goal of nursing is to maintain, strengthen and develop the [client’s] health by actively engaging him or her in a learning process. Because health is a learned phenomenon and the family is considered the primary socialiser in this learning, the family is the focus of nursing. The nurse strives to structure a learning environment that enables the patient to participate as fully as possible. The nurse and the patient
together set goals and, building on the patient's strengths and resources, devise means of achieving them. (p. 51)

Over the years, the McGill Model has been developed, refined, tested and implemented in various practice settings and has gained widespread acceptance in Canada and elsewhere as a useful framework for nursing practice. The McGill Model of Nursing, previously known as the Allen Model, the Developmental Health Model and the Strength Model, is a dynamic model that evolves today with the continued efforts of faculty members and students at McGill University (The McGill Model of Nursing, 2012).

There are several major assumptions that provide the underpinnings for the McGill Model. Perhaps the most important and fundamental of these is the belief that health is a nation's most valuable resource. Lalonde (1974) points out that "good health is the bedrock on which social progress is built. A nation of healthy people can do those things that make life worthwhile...and good physical and mental health is necessary for the quality of life to which everyone aspires." Obesity is a major health threat, and is one of the leading preventable causes of morbidity and mortality in all ages (McAdams, 2010). Overweight and obesity in children is a key predictor of obesity in adolescence and adulthood (Wald et al., 2011). Obese children experience psycho-social problems and discrimination in addition to substantial medical co-morbidities that adversely affect their quality of life (p. 1010).

The second major assumption of the model is that individuals, families and communities strive for and are motivated toward better health. Further is the assumption that within each individual there is the potential to develop and achieve this goal. Finally, health is best achieved through active learning, involvement and personal discovery. Wald et al. (2011)
describe primary care as an appropriate environment in which to influence large numbers of overweight children and their families.

Based on these assumptions the McGill Model describes that the fundamental task of nursing is to “assist families in developing their potential for health by engaging them in an active learning process” (Feeley & Gerez-Lirette, 1992). Further, “the unit of concern to the nurse is the family, since the family is the context in which learning occurs and health situations exist” (Allen, 1983). In order to achieve this nurses must have a broad knowledge base, one grounded in the sciences and the humanities. Skills of analysis and synthesis are also essential prerequisites (Gottlieb & Rowat, 1987). NPs working with families are well situated to address the problem of childhood obesity as children are seen more frequently for preventative care and treatment of common childhood illnesses during their early years. Treatment during early childhood may be more likely to yield long-term change (Wald et al., 2011).

Elements of the Model

Health.

Health is the central component and the focus of nursing practice in the McGill Model. Gottlieb and Rowat (1987) explain that health and illness in the McGill Model are viewed as separate entities that coexist. Health is conceptualized as a “dynamic, multidimensional construct encompassing a number of processes” (p. 54). Two processes that are salient in the model are coping and development. Coping refers to the effort of the individual and their family to deal with a problematic situation by problem solving. Problem solving activities include: identifying the problem, finding alternative actions and evaluating these alternatives. Development involves acts of recognizing, mobilizing, maintaining and regulating the
potentials and resources that reside within the individual, family and the larger social context. Gottlieb and Rowat (1987) describe that coping and development are both learned within the context of the family. They are viewed as dynamic, evolving over time and interconnected. Further, mastery of these processes enables the individual or family to function at a perceived maximum capacity and to achieve a high level of satisfaction with life (p. 54).

**Person.**

The second element of the model is person. The McGill Model recognizes that health is learned within the context of the family and thus person encompasses the entire family. Even though the family is the unit of concern, the individual is considered. Within the model the influence of the family on the individual and the effect of the individual on the family are recognized.

The McGill Model of Nursing recognizes that all individuals and families possess strengths, potentials, and resources. Within the model four different types of strengths are described that enable individuals and families to cope with life challenges, to change and to develop (Feeley & Gottlieb, 2000). The four strengths include: traits that reside within an individual or a family (e.g., optimism, resilience), assets that reside within an individual or a family (e.g., finances), capabilities, skills or competencies that an individual or a family has developed (e.g., problem-solving skills), and qualities that are more transient in nature than a trait or asset (e.g., motivation) (p.12). Potentials are described as precursors that could be developed into strengths. Resources include assets that are external to the family, such as the social network or the services that exist in the broader community (Feeley & Gottlieb, 2000).

Assisting families to manage their own inherent resources is referred to as resource-enhanced family nursing (Haggman-Laitila et al., 2010). The goal of resource-enhancing family
nursing is to help families use the resources of individual members and of the family unit as a whole, as well as external resources to the family system. The McGill Model of nursing provides nurses with the framework and knowledge to assist families to determine their own resources and support them to develop themselves and solve their own problems (Gottlieb & Gottlieb, 2007; Haggman-Laitila et al., 2010). To facilitate resource-enhanced family nursing, the nurse’s role is to establish a co-operative relationship with the family wherein the family’s expertise is appreciated and trusted. The nurse listens, respects and takes family members seriously. Once a trusting relationship has been established, the NP employs three strategies: identifying resources and providing feedback, developing resources, and calling for resources (Haggman-Laitila et al., 2010). The end goal is to support families to see that they have alternatives and possibilities to improve their situation.

**Environment.**

In the McGill Model the environment is viewed as the context within which health and healthy behaviors are learned. Gottlieb and Rowat (1987) state that although health is learned primarily within the context of the family, learning also occurs in varied settings such as acute care units, community health centers, long-term care institutions, schools and work places (p. 56). The person and the environment are in constant interaction, each influencing and being influenced by the other. As a result of this interchange learning occurs. Thus, nurses can facilitate the creation of new environments or manipulate existing ones in order to assist the individual or family in learning.

**Nursing.**

According to the McGill Model the primary goal of nursing is health promotion. As health is a learned process, the goal of the nurse in the McGill Model is to engage the individual
or family in the process of learning about and participating in healthy living. The nurse does this by including the individual and family as an active participant and collaborator in the health promotion process. Negotiation, collaboration and coordination are prominent features of the nurse-patient relationship.

The development of professional practice based on nursing models such as the McGill Model and others like it has had a significant impact on care delivery, nursing knowledge and practice and has led to the concept of family centered care (FCC) as a standard of nursing practice (Arango, 2011; Feeley & Gerez-Lirette, 1992). In the context of childhood obesity, NPs can use the McGill Model as a framework to develop family centered care plans that support families to identify their own strengths, develop coping mechanisms and achieve success. In doing this they have the potential to facilitate a positive change in the overall health and well being of the entire family.
Chapter Three

Approach and Research Methods

The approach to the Nurse Practitioner project consisted of an in-depth review of current academic literature on childhood obesity and family centered care. The literature search was conducted in order to obtain evidence to answer the question; “How can the nurse practitioner incorporate family centered care into practice in the assessment and management of childhood obesity in the primary health care setting?” The search process involved consultation with a research librarian and a systematic plan to search the literature including keywords used in the search and detailed inclusion and exclusion criteria was drafted and reviewed. The search strategy consisted of an initial web search, electronic database search, a search of evidence based practice (EBP) literature, a web site search, a search of archives of five top rated pediatric, obesity, family nursing, and nurse practitioner journals, and a search of reference lists. Inclusion and exclusion criteria are presented in Table 2.

Table 2

<table>
<thead>
<tr>
<th>Inclusion Criteria for Selection of Research Articles</th>
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<tbody>
<tr>
<td><strong>Inclusion criteria</strong></td>
</tr>
<tr>
<td>Published in the English Language, EBP guidelines from within North America</td>
</tr>
<tr>
<td>Peer reviewed research papers, studies, systematic reviews or dissertations</td>
</tr>
<tr>
<td>Relevant to treatment in a primary care setting and within the scope of the NP</td>
</tr>
<tr>
<td>Studies examining childhood obesity and or management of the disease</td>
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<tr>
<td>Studies focused on treatment of obesity using a family centered care approach</td>
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</table>
In consultation with the research librarian it was decided that limits would not be placed on publication dates. This was done because of the limited number of studies and research available on the use of family centered care in the management of childhood obesity and to ensure that seminal works in this field would not be excluded. Family nurse practitioners practice primarily within primary health care settings, so search parameters were focused in this clinical area.

The following data bases were searched: Cumulative Index to Nursing and Allied Health Literature (CINAHL), Health Source Nursing/Academic, Medline (Ovid), Pubmed Central, Psych Info, and Social Work Abstracts. Keywords were entered into each data base. MeSH and CINAHL headings were then used where appropriate to obtain relevant literature. The key words used in the search are shown in Table 3.

Table 3

<table>
<thead>
<tr>
<th>Keywords Used in Electronic Database Search</th>
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<tbody>
<tr>
<td>• Obesity (age limit 6-12, 13-18)</td>
</tr>
<tr>
<td>• Treatment</td>
</tr>
<tr>
<td>• Family centered care</td>
</tr>
<tr>
<td>• Nurse Practitioner</td>
</tr>
<tr>
<td>• Childhood obesity (age limit 6-12, 13-18)</td>
</tr>
<tr>
<td>• Management</td>
</tr>
<tr>
<td>• Family based care</td>
</tr>
<tr>
<td>• Pediatric Nurse Practitioner</td>
</tr>
<tr>
<td>• Morbid obesity (age limit 6-12, 13-18)</td>
</tr>
<tr>
<td>• Intervention</td>
</tr>
<tr>
<td>• Patient centered care</td>
</tr>
<tr>
<td>• Primary health care</td>
</tr>
</tbody>
</table>

The literature search was initiated by combining like terms from the list of keywords with the Boolean operator “or”. This resulted in thousands of hits. The searches of like terms were than combined using the Boolean operator “and”. This action limited the articles found to more manageable numbers. The title and abstract of each article found in the search was reviewed and articles were selected for further review based on the relevancy to the project and research question. The search included the terms Nurse Practitioner and Pediatric Nurse Practitioner but
research conducted and published by and about other health care providers was included due to
the limited availability of research conducted about NP practice and by NPs. Results of the
database search are presented in Table 4.

Table 4

<table>
<thead>
<tr>
<th>Database</th>
<th>Results</th>
<th>Articles selected for review</th>
</tr>
</thead>
<tbody>
<tr>
<td>CINAHL</td>
<td>30</td>
<td>19</td>
</tr>
<tr>
<td>Health Source</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Nursing/Academic Medline Ovid</td>
<td>1</td>
<td>0 (Duplicate article)</td>
</tr>
<tr>
<td>Pubmed</td>
<td>18</td>
<td>2</td>
</tr>
<tr>
<td>Psych Info</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Social Work Abstracts</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

The search of the EBP literature was completed using Dicenso, Bayley, and Haynes’ (2009) “Hierarchy of Pre-Processed Evidence” as a guiding framework. The Hierarchy of Pre-Processed Evidence is a tool that assists clinicians in appraising evidence. The tool is a pyramid depicting a hierarchy of pre-processed research evidence. The highest level of synthesized evidence is 'systems', followed by summaries, synopses of syntheses, syntheses, synopses of single studies, and finally single studies. The original and ongoing intent of classifying evidence in this way is to encourage decision makers to begin their search for evidence at the highest level of the pyramid, which is the most synthesized form of evidence, as opposed to beginning their search at the bottom of the pyramid, representing the least synthesized form of evidence. The pyramid can be used to guide decision makers in accessing the highest level of synthesized evidence.
evidence and only moving to lower levels in the pyramid when no evidence exists at a higher level (Robeson, Dobbins, DeCorby, & Tirilis, 2010).

Databases searched included (in hierarchical order) Clinical Practice Guidelines and Protocols in BC, CNA Standards & Best Practices, CMA InfoBase, National Guideline Clearinghouse, TRIP Database, DARE, Cochrane Database of Systematic Reviews, and Johanna Briggs Institute Database of Systematic Reviews. Articles were selected for review based on inclusion and exclusion criteria. The title and abstract of the remaining articles were reviewed and each article was selected or rejected based on relevancy to the project. Results of the EBP search are presented in Table 5.

Table 5

<table>
<thead>
<tr>
<th>Database</th>
<th>Results</th>
<th>Articles selected for review</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical Practice Guidelines and Protocols in BC</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>CNA Standards &amp; Best Practices</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>CMA InfoBase</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>National Guideline Clearinghouse</td>
<td>40</td>
<td>2</td>
</tr>
<tr>
<td>TRIP Database</td>
<td>2939</td>
<td>12</td>
</tr>
<tr>
<td>Cochrane Reviews</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Johanna Briggs Institute</td>
<td>32</td>
<td>3</td>
</tr>
</tbody>
</table>

Websites from government health agencies and leading health organizations that were searched include: Public Health Agency of Canada (PHAC), Statistics Canada, Center for Disease Control and Prevention (CDC), Obesity Canada, and the World Health Organization.
Specific articles were not retrieved during the initial literature search however specific data was retrieved later during the process of writing the project paper.

Finally, during the process of analyzing the content of the articles found during the literature search, the reference list of each research paper was manually searched. Any research article titles that did not appear in the initial literature search and appeared relevant to the project were selected. The articles were then obtained from electronic journals or the library for review.

The total number of articles and guidelines chosen for analysis was limited by the length of this project. Of the 41 articles selected for review, 20 were retained after initial analysis to be included in the project. The clinical practice guidelines were included because they are the most current recommendations available for use in NP practice. The remainder of the articles were selected for review based on; analysis of the use of family centered care in the management of childhood obesity, publication date within the last 10 years (although seminal works in the field were not excluded based on date of publication), and relevancy to NP practice in Canadian primary health care settings. Seminal works were identified by means of citation analysis.

During the review of the reference lists of the articles retrieved from the database search it was noted that one key research article was referenced numerous times. A subsequent search using the Web of Science database to search cited references was completed. Epstein, Valoski, Wing and McCurley (1990) was found to have been cited 334 times. Based on these findings, the article was included in the literature review as it is considered a seminal work in the field.

Sixteen research articles, one systematic review, one meta-analysis and two clinical practice guidelines were included in the review of the literature. Two of the 16 research articles (Arango, 2011; Shields et al., 2006) provide insight into the concept of FCC, and seven of the 16 research articles are referenced in the discussion regarding the use of the McGill Model of
Nursing as a framework for providing FCC (Allen, 1983; Feeley & Gerez-Lirette, 1992; Feeley & Gottlieb, 2000; Gottlieb & Rowat, 1987; Gottlieb & Rowat, 2007; Haggman-Laitila et al., 2010; Lalonde, 1974). The remaining seven research articles, systematic review, meta-analysis, and two clinical practice guidelines are analyzed in Chapter Four.
Chapter Four

Findings

The Literature Review

Current clinical practice guidelines regarding the management of childhood obesity provided a starting point for examining the literature on the management of childhood obesity. Peer reviewed clinical practice guidelines are used by primary health care providers including nurse practitioners to guide decision making in clinical practice. They are often the first research that clinicians access when researching a practice query. Therefore, an analysis of two clinical practice guidelines is included in the review. The use of family centered care (FCC) in the management of childhood obesity in the primary care setting is the second major focus of this chapter.

Current Clinical Practice Guidelines

Evidence based clinical practice guidelines provide clinicians with relevant, peer reviewed information on assessment, screening and strategies to manage childhood obesity once it has been identified in clinical practice. The first step during the literature review process was to look at current clinical guidelines and examine current recommendations regarding the management of childhood obesity in the primary health care setting.

They are the most relevant to NPs and family physicians practicing in BC. There were several American guidelines that were also relevant however Bariow (2007) was mentioned most often in the childhood obesity literature. It was also the subject of a recent article on childhood obesity in a leading peer reviewed NP publication (Hopkins et al. 2011) and was selected based on these two factors.
The current Canadian clinical practice guidelines regarding the treatment of childhood obesity were developed by the Canadian Medical Association (CMA) in collaboration with Obesity Canada. They were published in 2006. The recommendations in the guideline provide a solid foundation on which a PCP can initiate treatment. They support the use of family orientated behaviour therapy. The CMA also endorses the use of lifestyle intervention including a comprehensive weight management program as the preferred method of treatment for childhood obesity. They suggest the role of the health care provider in facilitating a weight management program is to provide appropriate education, support, and therapy.

Barlow (2007) provides a step by step approach to childhood obesity management and thus may be helpful to NPs who have limited experience caring for obese children. This guideline promotes the use of four stages of intervention in the treatment of childhood obesity; prevention plus; structured weight management; comprehensive multidisciplinary intervention; and tertiary care intervention. The first two treatment stages would be appropriate to a primary health care setting although more intense treatment stages will generally occur at a tertiary care facility.

Both guidelines provide information on initiating treatment of childhood obesity as well as treatments that may be initiated in tertiary care centers including pharmacotherapy and surgical intervention. They suggest the first step in treating childhood obesity is implementing a family centered program focused on lifestyle modification such as healthy eating and exercise. Although the guidelines provide evidence based recommendations for managing childhood obesity it is up to primary care providers to apply them to practice. This could be potentially difficult for some practitioners depending on their experience and education regarding family centered care. The research gathered during the literature search sheds some light on what FCC
is, its efficacy in reducing BMI in overweight and obese children and how practitioners can incorporate it into family practice.

**The Use of Family Centered Care in the Management of Childhood Obesity**

The review of the literature on the use of FCC in the management of childhood obesity is discussed below. First, the research focusing on why the use of FCC is appropriate in the management of childhood obesity is examined. The relationship between the use of FCC and weight loss in children is explored and long term weight loss reviewed. Finally the use of family centered care in severe obesity and the primary health care setting is analysed.

Three research articles regarding the use of FCC were reviewed and analysed to determine why the use of FCC is appropriate in the management of childhood obesity. Family centered care is important in the context of childhood obesity management because the home environment and the family is the most influential setting for shaping children’s eating and physical activity behaviours (Goran, 2006). The use of FCC in treating childhood obesity is relevant because dynamic influences on obesity include the family environment, social determinates of health, and both parents’ and children’s knowledge and attitudes about healthy lifestyles (Tyler & Homer, 2008). Children learn from their environment, beliefs about what is healthy or unhealthy are communicated through family conversations as well as the actions and choices of individual family members, these actions and choices are influenced by the environment and SODH (p. 196).

Tyler and Horner (2008) suggest incorporating FCC into practice can be a positive experience for both the family and primary care provider. Practitioners who recognize and address the impact of the family environment on children’s health and advocate the use of the guiding principles of FCC when managing childhood obesity in primary health care can make
meaningful differences in lifestyle behaviours of the family, and therefore the child (p.196). Use of FCC can also lead to improved health-related quality of life, reduced health risks and overall well being for the entire family (Cifuentes et al., 2002).

Although the literature supports the use of FCC in primary health care adopting FCC into primary health care practices for the purpose of obesity management can be challenging for providers. Obesity can be a difficult topic to discuss and conflicts can arise during discussions about changing lifestyle behaviours (Tyler & Horner, 2008). Understanding the key principles of FCC can assist care providers in establishing a successful family/professional partnership.

The relationship between family centered care and weight loss.

One meta-analysis and a systematic review were selected because they specifically address the relationship between the use of FCC and weight loss in obese children. The meta-analysis was completed by Young et al. (2007). The objective was to evaluate the effect of a family-behavioral component in weight loss treatments for children. Studies published in the English language evaluating family-behavioral treatment for weight loss in children aged 5 to 12 years were eligible for inclusion. The intervention family-behavioral treatment was defined as the use of at least one named behavioral or cognitive-behavioral technique to encourage children to pursue and maintain healthy physical and/or eating habits. At least one parent or guardian had to be involved in the treatment of the child.

Young et al. (2007) found family-behavioral treatments carried a statistically significant reduction in mean percentage overweight. The reduction in percentage overweight with family-behavioral treatments remained significant at follow up averaging four months. The effect of other treatments on weight reduction was not significant. They concluded that weight-loss
interventions that include a family-behavioral component are associated with a significant weight reduction, which was maintained in some studies beyond 24 months.

Limitations of Young’s meta-analysis were as follows; only studies published in English were considered which might have introduced a language bias. The potential influence of publication bias was not considered. No quality assessment of the included studies was reported; the potential impact of methodological flaws in the primary studies upon the reliability of the review findings cannot, therefore, be assessed. Not all of the studies reported follow up data. Although this is a strong study it was conducted in a psychology clinical setting and thus applying these findings to NP practice may not yield the same results. Finally the fact that the authors conclusions are based on a relatively small number of studies and participants mean conclusions must be viewed with caution.

Young et al. (2007) provide strong evidence that weight loss interventions involving FCC approaches can result in significant short term weight loss. Their definition of family behavioral treatment does not indicate that any of the key principles of FCC were considered or practiced during interactions with families. These findings are significant as modest weight loss has been associated with significant health improvement and a reduction in overall risk of morbidity and mortality in obese children (Garipagaoglu, Sahip, Darendeliler, Akdikmen, & Kopuz, 2008). Young et al. (2007) also demonstrated that weight loss achieved using family based management strategies is achievable and can be maintained short term. Even short-term weight loss is important as small successes can have a profound impact on health status (Wing et al. 2011). Families who achieve successful weight loss early in treatment are more likely to have long-term success (Goldschmidt et al., 2011).
The systematic review was conducted by Berry et al. (2004). Their objective was to assess family centered interventions for childhood obesity. The authors reviewed randomized controlled trials (RCTs) that followed participants for a minimum of 6 months and studies of family centered interventions for childhood obesity that used nutrition, exercise or behavioral methods for weight reduction were included. Family centered interventions were defined as those targeting the child and at least one parent. Studies involving pharmacotherapy or bariatric surgery were excluded as were studies not published in English and non-randomized clinical trials. Participants were obese children ranging in age from 5 to 17 years old.

The reviewers concluded that behavioral modification interventions that targeted children and parents together or separately were successful in improving weight-loss outcomes in both parents and children. Behavioural therapy interventions targeting children and parents together or the parents of children separately improved weight outcomes. Problem solving interventions that targeted parents of children showed improved weight outcomes for their children but weight outcomes did not improve when problem solving was used with both parents and children together or children alone.

Although Berry et al.'s (2004) findings support family centered intervention as a successful method of managing childhood obesity there were several limitations. Limitations of the systematic review were that the review was limited to studies published only in English, no attempts were made to find unpublished studies thus there was potential for both publication and language bias. One study included in the review did not meet the inclusion criteria for study design. The number of studies included in the study was small and generally “methodologically inadequate” (p. 443). Researchers did not elaborate as to how information was delivered to families just that interventions had to target the child and one parent to meet criteria for
inclusion. There was no mention of principles of FCC or how therapeutic relationships were established. The reviewers also pointed out that 70% (n=9) of the studies reviewed did not report either the socioeconomic status or ethnicity of the participants. Of the studies that did report, the participants were predominately Caucasian and from middle to upper socioeconomic groups. This is of concern as research has shown a strong association between ethnicity, socioeconomic status and obesity.

While the evidence suggests that managing childhood obesity using FCC is effective in Caucasian participants of middle to upper socio-economic status, Berry’s systematic review has failed to include research that addresses the influence of ethnicity on health and obesity. This brings into question the relevance of the findings to specific ethnic populations with higher rates of childhood obesity such as Canadian Aboriginal youth living off reserve. Primary care providers working with specific ethnic and minority populations such as Canadian First Nations youth may want to view the findings with caution. Research has shown that childhood obesity is influenced by the environment and SODHs. Models such as the McGill Model of Nursing suggest practitioners support families within the context of their environment and SODH. Despite this, researchers have failed to address the effect of the environment and SODH on obesity and successful management of childhood obesity in this systematic review.

**Effect of family centered care initiatives on long-term weight loss.**

The following two research studies address the long-term outcomes of the use of FCC in managing childhood obesity. The first study examines the effects of FCC on long-term weight loss in children. The second evaluates the effect of FCC on both short and long-term weight loss.

A ten-year follow up study by Epstein et al. (1990) was included in this literature review as it is considered a seminal work in this field. The purpose of this study was to examine the
effects of behavioural family centered management on percent overweight and growth over 10 years in obese 6 to 12 year old children. Researchers used a prospective, randomized, controlled design with an intervention described as a diet, exercise and behaviour management training program. Seventy-six obese children aged 6 to 12 years and their parents were assigned randomly to one of three treatment groups, 1) child and parent target; 2) child target; and 3) non-specific target. Group one reinforced parent and child behaviour change and weight loss, group two reinforced child behaviour change and weight loss and group three reinforced families for attendance. All treatment groups met weekly for 8 weeks and approximately once per month for 6 months. Children and parents were given US $5 for every visit at which the parent and child lost weight. Follow-up data were collected at 21 months, 60 months and 120 months. The percentage change in weight for height, age and gender was the primary outcome variable.

The results of the study found significant weight loss (p<0.05) shown at both 5 and 10 years with children in group one. Children in groups two and three showed an increase in percent overweight from baseline to 5 and 10 years. Strengths of the study include the duration of the study, and that it followed children who had obese parents. The study concluded that using behavioural family centered management to focus on healthy eating, exercise and behavioural skills training can result in long term sustained weight loss. It also concluded that children with obese parents who participated in such programs were able to maintain significant weight loss over time.

Limitations of the study are that it only included middle class, Caucasian participants from intact, two parent families. It did not address the effect of the participant’s environment or SDOH on their obesity. It was conducted strictly in an urban setting. There was no mention of any of the principles of FCC. The authors concluded that additional research would be required
to determine whether the results of the study would be comparable in or if treatment protocols would need to be tailored to the differences that exist across families. The reinforcement techniques (use of money as a reward) and the object of the reinforcement (weight loss) are no longer recommended (Connelly, Gargiula, & Reeve, 2002). Reward structures are more appropriate and meaningful if based on praise and activities that strengthen family relationships rather than food, money or gifts. The object of the reward should be based on factors directly within the control of the child such as eating and exercise, rather than weight loss which can be influenced by genetics or metabolic factors (Connelly et al., 2002; Epstein, 1996).

Results of this study were the first to provide evidence that if long-term behavioural, family centered management is initiated when a child is between the ages of 6 and 12 years, positive weight loss results can be maintained into young adulthood. The results are promising as they indicate that the use of family centered management in children not only results in weight loss, but also in maintained weight loss over time in participants where genetic risk factors are present. This is important as it provides evidence that children presenting with non modifiable risk factors can successfully lose weight, decrease their risk of morbidity and mortality and maintain their weight loss over time.

Garipagaoglu et al. (2008) published a study to assess the short and long term effects of a three month family based group treatment in the management of childhood obesity versus individual treatment. It involved 80 obese children between 6 and 14 years. Forty participants and their parents were randomly assigned for group treatment and the other 40 for individual treatment. The intervention program focused on implementing healthy eating behaviours and involved a three month weight control program for children that included seven 30 to 90 minute training sessions at two week intervals. The goal of the program was to teach lifelong healthy
eating habits and to decrease sedentary habits. The first session started with the definition of nutrition and teachings about diet behaviour modifications. Feedback was obtained from the children and parents regarding their children's obesity, preferred foods, and current dietary and cooking habits. The first session also stressed that motivation and involvement of the entire family is important in the battle against overweight. Subsequent sessions were devoted to nutritional education including how to balance good nutrition and weight loss, how to eat the right kinds and amount of foods according to height, age and activity level, healthy food preparation methods and included tips for staying on target at school lunches, restaurants, parties and holidays. Height and weight were measured initially, at each session and during follow up visits. Body mass index was calculated and expressed as standard deviation score. The result at the end of the three month treatment program was a significant decline in BMI in both groups \((p<0.001)\). After one year there was still a significant decrease in BMI in the family treatment group whereas the decrease in BMI in the individual group was not maintained.

Limitations include the limited description of participants. There was no mention of socio-economic status, education levels or ethnicity of the participants. Although the study was conducted in the primary care setting it was conducted in Turkey where the geography and ethnic diversity is different than the Canadian context. It was also conducted in an urban primary care setting. Although the findings are relevant to all NPs working in a primary health care settings, this specific intervention may have to be modified to meet the needs of families in Canadian primary care settings.

The results of the study are promising for Canadian NPs. The findings of the study demonstrate that family based group treatment is more successful than individual treatment in the management of childhood obesity and that significant weight loss can be attained and
maintained long term using family centered care to manage childhood obesity. This study shows that family centered interventions are an efficient method of managing childhood obesity and that success can be achieved in relatively few sessions. The description of the intervention in this study is detailed and could easily be implemented in the Canadian primary health care setting. The intervention incorporates many of the key principles of FCC including honouring cultural diversity and family traditions, recognizing the importance of community, encouraging family-to-family and peer support and celebrating successes. Although the data is preliminary, these results also point to FCC as a being a potentially cost effective method of managing childhood obesity. This type of intervention could be easily facilitated by NPs working in a primary health care clinic.

**The use of family centered care in managing severe obesity.**

Kalarchian et al. (2009) conducted a study to evaluate family centered behavioural weight control in the management of severe pediatric obesity. Participants were 192 children 8 to 12 years of age. The average BMI percentile for age and gender was 99.18 (SD: 0.72). Eligibility criteria included age, BMI, ≥97th percentile, and adult willing to participate with child. Authors listed extensive exclusion criteria. Families were assigned at random to the intervention or usual care. The intervention consisted of 20 hour long group meetings over a 6 month period. Intervention included counselling, self monitoring records and setting weekly goals. Three group sessions and three telephone calls occurred between month 6 and 12. Assessments of the children were conducted at baseline, 6 months, 12 months, and 18 months. There was no contact between the 12 month and 18 month assessments. Child percent overweight, calculated as percent over the median BMI for age and gender was the primary study outcome.
Results showed that intervention was associated with significant decrease in the percent overweight compared to usual care at six months. Intervention was associated with a 7.58% decrease in percent overweight at six months ($p = 0.0001$) compared with a 0.66 decrease with usual care. Differences were not found to be significant at 12 months or 18 months. Although impact on percent overweight was modest the intervention was found to have positive effects on other health parameters compared to those who received usual care including improvements in waist circumference, systolic blood pressure, percent body fat and total body fat.

Limitations of the study are that the study did not control for different components of the family based intervention program so results cannot be attributed to specific interventions. The study was a university based research program conducted at a university hospital so may not be representative of programs based in the primary care setting. The participants of this study were required to attend 20 group meetings over a period of six months. This type of intensive program with numerous sessions may not be feasible in a remote, non urban setting.

Strengths of this study included assessment of the effects of family based programs on other health parameters including waist circumference, body composition, and blood pressure. This study also incorporated many of the demographic variables and SODH that the McGill Model identifies as key factors affecting a family’s ability to achieve health. Some of the variables studied include: gender, ethnicity, level of education achieved by parents, and socio-economic status.

The results of this study are useful for care providers caring for severely obese children because that it supports the use of non invasive family centered interventions before consideration of more risky, controversial therapies such as pharmaceutical therapy and bariatric surgery. Although pharmacotherapy and surgery are suggested for use in extremely obese
children (BMI > 40) (Barlow, 2007), there are associated risks with these types of treatment. This study suggests that weight reduction and improvements in medical parameters (waist circumference, body composition, and blood pressure) can be achieved in severely obese children in a manner that mitigates risks using family centered approaches. Although this study indicated that FCC based interventions were successful in reducing BMI in severely obese children, further research would need to be conducted to determine if severe pediatric obesity can be managed appropriately in the primary health care setting before considering more invasive interventions.

**Use of family centered care in primary health care settings.**

The final study that was reviewed was a recently published study by Wald et al. (2011). It was conducted specifically in the primary health care setting. The study was a prospective cohort design. The objective was to assess an intervention for obese children age 9 to 12 and their families delivered by trained professionals in the primary health care setting. The intervention was described as a family-based, behavioural weight management program consisting of 11 sessions. The length of the sessions was not mentioned. The program consisted of a calorie goal, self-monitoring of daily food intake, physical activity and sedentary behaviour, and other behaviour change skills.

Participants were 78 families recruited from five private practices. Eligibility criteria included BMI ≥95th percentile for age and gender and had a parent/caregiver willing to participate and attend all sessions. Exclusion criteria included children with severe medical conditions related to their obesity that required aggressive treatment (severe sleep apnea, significant endocrinologic abnormalities) or cognitive impairments that prevented them from participating in the program. Fifty three children immediately began treatment and 23 waited
three to four months before beginning treatment becoming the “quasi” control group.

Measurements were taken at baseline, 15 weeks, 12 months and 24 months. The primary outcome measures at the conclusion of the intervention were the change in weight, BMI and BMI $z$ score. Results indicated that at the time of completion of the program (15 weeks) among the 55 children who completed the program the mean weight loss was 2.4 lbs compared with a mean weight gain of 3.45 lbs among 23 control children. The authors concluded from these findings that providers working in the primary health care setting are ideally situated to address the problem of obesity since children are seen frequently for preventative care and management of common childhood illnesses. The frequency of visits during the early years of a child’s growth and development provides opportunity to assess BMI at every visit and intervene early on when overweight and obesity is confirmed (p. 1). In addition, parents most often present with their children during visits to the primary health care clinic and are thus available to participate in counselling and other interventions.

Limitations of this research include the small sample size ($n=55$) and the brief time frame in which the study took place. The authors also stated that participants were relatively homogeneous in terms of education, race, and economic status, which may limit generalizability. However, the fact that the weight loss was achieved over a relatively short treatment period (15 weeks) is a very positive finding as this could be easily accomplished in the primary health care setting.

Throughout the literature reviewed researchers have found family centered initiatives to result in weight loss in obese children while benefiting the entire family. Research indicates that FCC based initiatives are easily facilitated and promising results can be achieved in relatively few sessions. Most of the research focused on the relationship between the use of FCC and
amount of weight loss in obese children both short and long term. The data indicates that FCC programs result in short term weight loss as well long term weight reduction and maintenance. This is particularly promising as significant health improvements have been shown to occur even with modest decreases in BMI (Kirk et al., 2005). Further, FCC based programs were found to be successful in decreasing BMI in severely obese children and thus could be considered before initiating more invasive treatment.

The few articles that specifically addressed the effect of the environment and SDOH on childhood obesity were also important as the literature has demonstrated the influence of these factors on obesity. The final research article addressing the use of family centered interventions by a multidisciplinary team in a primary health care setting is positive for NPs considering using family centered care to manage childhood obesity in their own primary care practices.
Chapter Five
Discussion, Conclusions and Implications

The previous chapters identify childhood obesity as a complex, multifaceted problem. A review of the current guidelines concerning the management of childhood obesity resulted in the identification of the use of family centered care as a recurrent recommendation. From the review the following question of inquiry “How can the nurse practitioner incorporate family centered care into practice in the assessment and management of childhood obesity in the primary health care setting?” was developed. The literature was analyzed with a focus on the use of family centered care (FCC) in the management of childhood obesity in the primary care setting.

The use of family centered care is widely advocated in both the current clinical guidelines but is not clearly defined. There is also little information readily available to providers on how FCC can be facilitated into practice. The research reviewed while not homogenous, provides insight into what FCC is, the key principles of FCC and why it is important in childhood obesity management. In order to promote the use of FCC in the treatment of childhood obesity, it is imperative that NPs are aware of what FCC is, why it is important to the management of childhood obesity in the primary health care setting, and how to facilitate it into practice.

NPs are in a unique position as nurses to be able to use their nursing knowledge to facilitate family centered care into practice. Reviewing the key principles of FCC as suggested by Arango (2011) is a good place for NP’s interested in FCC to start. NPs working with families can then utilize their nursing knowledge by using the McGill Model of Nursing to assist them in facilitating FCC into practice.

The McGill Model complements Arango’s (2011) principles of FCC by providing further insight into many of the elements of FCC such as the concept of partnership with the family, open communication and perhaps most importantly, building on family strengths, potentials and
resources. The model also incorporates and elaborates on the importance of factors such as the environment and SODH which both strongly influence obesity.

In order to facilitate FCC into practice using the McGill Model, the NP focuses on building a relationship with the family based on negotiation, collaboration and coordination. The first step is to engage the individual or family in the process of learning about obesity and practicing healthy living. The NP then supports the family to build coping skills and develop by identifying the strengths, potentials and resources within themselves and the larger social context. The NP can then assist the family to mobilize, maintain and regulate these potentials and resources to achieve their weight loss goals. This is important as assisting families to develop and use their own inherent strengths and resources, is a critical feature of health and healthy behaviour (Warner, 1981). Recognizing that the environment, SODH, culture, and ethnicity have a profound impact on obesity, the NP can also help the family create new environments or modify their existing environment in order to learn new coping strategies and achieve healthy ways of family functioning.

Table 6 outlines how NPs can look to the McGill Model to support implementing the principles of family centered care into practice.

**Implications and Recommendations for Nurse Practitioner Practice**

NPs contribute to the health care needs of Canadians by providing care that is shaped by their own unique educational background and regulated by their jurisdictional authority. Nursing education prepares NPs to work with individuals, families, groups, communities and populations in diverse and often challenging settings (CNA, 2007). Implementing the NP role in Canada is an important step in reforming our health care system (Pogue, 2007). The current health care system in Canada is focused on illness and treatment of disease, and Pogue (2007) proposes that
### Table 6

**Using the McGill Model to Facilitate Family Centered Care into Practice**

<table>
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<tr>
<th>Principles of FCC</th>
<th>Applying the McGill Model to support FCC</th>
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<tbody>
<tr>
<td>1. Acknowledges the family as the constant in a child’s life</td>
<td>• Family is considered the primary socializer in learning and family care is the focus of nursing</td>
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<tr>
<td>2. Builds on family strengths</td>
<td>• All families possess strengths, potentials and resources. Within the model four strengths are described.</td>
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<td></td>
<td>• Nurses assist families to identify these strengths, set goals, and build on their strengths to devise a means of achieving goals</td>
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<td>3. Supports the child in learning about and participating in his/her care and decision making</td>
<td>• Central goal of nursing is to maintain, strengthen, and develop the child’s health by actively engaging him/her in a learning process.</td>
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<td>• This is best achieved through active learning, involvement and personal discovery.</td>
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<td>4. Honours cultural diversity and family traditions</td>
<td>• The model recognizes that within the family each person brings a “different genetic endowment, personal history, and physiological, psychological, and social makeup” (Gottlieb &amp; Rowat, 1987).</td>
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<td>5. Recognizes the importance of community-based services</td>
<td>• Resources such as community based services are assets that can be utilized by families to assist them in solving their own problems.</td>
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<td>6. Promotes an individual and developmental approach</td>
<td>• Nurses assist families to develop and cope by working with them to identify problems, find alternative actions to solve them and evaluate outcomes.</td>
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<td>7. Encourages family-to-family and peer support</td>
<td>• Although health is learned primarily within the context of the family, it is also influenced by others and the environment.</td>
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<td>• Families are encouraged to develop relationships and learn from the constant interaction with their environments.</td>
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<td>8. Supports youth as they transition to adulthood</td>
<td>• Health is recognized as dynamic and evolving therefore the nurse must continually revise, modify, update and validate the family’s profile as they grow and develop (p. 57).</td>
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<tr>
<td>9. Develops policies, practices, and systems that are family-friendly and family centered in all settings</td>
<td>• The primary goal of the nurse is to assist families in developing their potential for health by engaging them in active learning; the nurse also assists families to manage their inherent resources by participating in resource-enhancing family nursing.</td>
</tr>
<tr>
<td>10. Celebrates successes</td>
<td>• The nurse acknowledges successes as strengths and works with the family to build on them.</td>
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it "be rebalanced to include an orientation based on wellness and holistic care, with a greater emphasis on prevention of disease, illness and injury" (p. 34). NPs are poised to play an instrumental role in the remodelling of our current health system as fundamental values such as wellness, holistic care, prevention of disease, illness and injury are embedded in the current nursing paradigm and can help lead the way as new care delivery models are introduced (p. 35).

The literature reviewed provides direction for NP management of childhood obesity in the primary health care setting. Interventions that incorporate the use of FCC are making a difference in the lives of overweight and obese children. NPs working in primary health care are well suited to facilitating FCC into practice as "educating and counselling individuals and their families regarding healthy lifestyle behaviours are key components of NP care" (Sherwood, Brown, & Fay, 1997). As Tyler and Horner (2007) also point out primary care providers (PCPs), with a nursing background are well educated in "establishing rapport, ensuring a trusting therapeutic relationship, and developing a health plan based on mutual goals" which are the underlying principles of FCC (p. 201).

Specific recommendations for nurse practitioner practice regarding the management of childhood obesity were derived from the recommendations of current clinical guidelines, the findings of the literature review and the limitations and areas for further study. The recommendations for NP practice are shown in Table 7. They are presented in a five step format which can be quickly and easily referenced by NPs in practice.

Further recommendations for the development of NP practice include: NPs educating themselves regarding the principles of FCC and the McGill Model of nursing to increase knowledge and understanding about caring for families which can then be applied to practice; ongoing review and critical analysis of current and emerging obesity literature as new
developments and findings arise; NP lead multidisciplinary discussion regarding childhood obesity, current obesity literature, and how to address the limitations in childhood obesity literature; and NPs partnering with researchers to support research that addresses the limitations in childhood obesity literature.

**Areas for Further Research and Study**

Continuing research is important as ‘translation of evidence derived from research is the foundation of practise for NPs” (McAdams, 2010). While researchers agree that FCC works and should be incorporated into practice, there has been very little research published on what steps primary care providers need to take in order to achieve this. The McGill Model of Nursing incorporates the elements of FCC and provides a framework for incorporating FCC into practice that addresses factors that strongly influence childhood obesity such as the environment and SODH. The McGill Model is a valuable tool that can be utilized by NPs and other PCPs when using a FCC care approach to managing childhood obesity in practice. Further research regarding the specific use of the McGill Model in managing childhood obesity would be very useful to NPs in the primary health care setting.

The McGill Model of Nursing views the environment as the context within which health and healthy behaviours are learned (Gottlieb & Rowat, 1987). Additional studies related to the use of FCC to manage childhood obesity in multicultural populations, varied socioeconomic backgrounds, or participants with low levels of education would assist NPs to provide holistic care. Further research involving delivering FCC to blended families, single parent families, children living with guardians, and to families with children who have physical or psychological problems would be invaluable to NPs working with families to combat childhood obesity.
<table>
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<tr>
<th>Five steps for assessing and managing childhood obesity</th>
<th>Recommendations for NP practice</th>
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<tr>
<td>1. Measure height, weight and calculate BMI for every child at every visit.</td>
<td>- Height and weight should be measured and BMI calculated and recorded using CDC growth charts at every visit. [BMIs ≥85th to 95th percentile (overweight) and ≥95th percentile (obese)].</td>
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| 2. Intervene | - Once overweight and obesity confirmed, immediate intervention is required.  
- Current Canadian guidelines recommend a full history and physical exam be performed to rule out endocrine or syndrome related causes of obesity and screen for obesity related complications.  
- FBG and lipid profile are recommended for children ≥10 years of age.  
- Additional investigations (liver enzymes, urinalysis and sleep studies) may be ordered when appropriate to exclude common obesity related health problems. |
| 3. Promote lifestyle modification using a family centered approach | - Lifestyle modification aimed at the entire family is the preferred method of childhood obesity management.  
- Role of the NP is to facilitate a FCC based program by incorporating the key principles of FCC and looking to the McGill Model as a framework for implementing FCC into practice (see table 6).  
- Programs should provide appropriate education, support, and therapy aimed at healthy eating, increased physical activity and reducing sedentary activities and “screen time”.  
- Prescribed activity should be fun, recreational and activities should be tailored toward and appropriate to the strengths of the child and family. |
| 4. Set realistic goals, celebrate success! | - Goal setting should be related to healthy behaviours not specific to measurable weight loss and be easily attainable.  
- Successes should be acknowledged and the family commended for their efforts and achievements. |
| 5. Follow-up frequently | - Frequent follow up (monthly) is recommended initially, and at regular intervals thereafter (at least every 3-6 months).  
- Height and weight should continue to be monitored at every visit (regardless of presenting complaint) until the child reaches age 18. |
More research regarding specific interventions would also assist practitioners. Further study on delivering childhood obesity programs to groups or individual families and addressing optimal group size would be valuable. Examination of specific interventions would also be of use to practitioners attempting to teach families about healthy eating behaviours and exercise.

**Summary and Conclusion**

Childhood obesity is quickly becoming an epidemic worldwide yet Benson, Baer, and Kaelber (2009) state that studies have shown that many providers do not consider childhood obesity a priority diagnosis. Childhood obesity is a disease; one that is associated with multiple comorbidities and early mortality (Hopkins et al. 2011). Childhood obesity may be simply described as a problem of too much energy intake and too little energy expenditure, however the reality is much more complex as “environmental factors, family characteristics, and parenting styles all contribute to a child’s behaviours, perceptions, self esteem, and body image” (Golan & Crow, 2004). The literature review revealed a definite disconnect between the availability of research on the increasing rates and consequences of childhood obesity and the available literature on the management of the disease. The research obtained for the purpose of this NP project indicates using a FCC approach to disease management is effective and can be achieved in the primary health care setting. Despite these findings childhood obesity rates continue to rise. Further, more focused research on implementing effective and efficient FCC programs is needed. Primary care providers including nurse practitioners working with families of obese children will need to be aware of current and emerging research and acquire the necessary knowledge and skills to combat this disease quickly and efficiently.

The results of this literature review indicate that implementing a management program in the primary health care setting that incorporates FCC is a good place to start, but much work still needs to be done. As the childhood obesity rate continues to rise, it is imperative that NPs
familiarize themselves with FCC, use their nursing knowledge to incorporate FCC into practice and become actively involved in further research regarding FCC and childhood obesity. Failure to do so may have significant consequences:

“I am a fat kid
I have a fat mom and dad
But I will die first”

Haiku for childhood obesity (author K.F. Hopkins in Hopkins et al., 2011)
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