

A DESCRIPTIVE STUDY OF CHILDHOOD OBESITY MONITORING
PRACTICES USED BY MONTANA PEDIATRIC PROVIDERS

by

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April 2008

DEDICATED

To Shirley Ann Motley, my mom and my hero. She has taught me... love is strong and home is always there no matter how far you wander. I want to be like you, mom.

To my husband Michael, who shares my journey and my life. He is the keeper of my heart, for always. I love you.

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ABSTRACT

INTRODUCTION: The global prevalence of childhood obesity is increasing. Overweight children face risks of compromised physical and mental well being, increased incidence of disease processes, and increased risk of adult obesity. Pediatric providers play a unique role in reversing the prevalence of obesity, yet there is little understanding of what practices are utilized to monitor children's weight. **PROBLEM:** Identifying children who are obese or are at risk for becoming obese may rely on evidence based weight monitoring practices. For many providers there may be a gap in knowledge regarding recommended practices for measuring growth in children. The purpose of this study was to describe current practices for monitoring obesity of children used by Montana primary pediatric providers. **METHODS:** A descriptive, cross-sectional study was conducted using a mailed pencil and paper survey, sent to 300 primary pediatric providers in Montana selected from 900 Child Health Insurance Plan (CHIP) providers. Eighty-five surveys were returned for a response rate of 28%. Data analysis utilized SAS software; results were analyzed using frequencies and percentages. **RESULTS:** A total of 85.7% of respondents offered care in family practice settings; 17.6% are pediatric specialists, 31.8% are practicing rurally and 57.6% of providers saw 5 or fewer children/per day. Over 95% of providers measured height and weight, 61.2% calculated body mass index (BMI). Just 55.8% of those who measure BMI accurately plotted it on age/gender specific chart, or 34% of total respondents. All respondents perceived childhood obesity as a concern, with patient/parent resistance cited as the most common barrier to treatment. **CONCLUSION:** Health disparities in Montana associated with rural populations include fewer pediatric specialists, fewer child healthcare visits, and barriers of access, education level and money for patient and their families. In Montana, height and weight measurements are used predominately to monitor children's growth; BMI was accurately used by one third of respondents which may interfere with the provider's ability to accurately identify adiposity. These findings suggest a focus area for provider education, promoting BMI guidelines for children. Perceptions of barriers: patient/parent resistance, time constraints, and reimbursement; suggest treatment protocols could improve outcomes for childhood obesity.

CHAPTER 1

INTRODUCTION

The *Healthy People 2010* objectives identify obesity as one of the most significant current health promotion and disease prevention priorities in this country because it is a major contributor to many preventable causes of death. Obesity in children is an equally significant public health concern. In addition, there is evidence that the incidence of children who are overweight is increasing despite efforts to the contrary. *Healthy People 2010* objective 19-3 calls for the reduction of the percentage of children and adolescents who are overweight or obese from the 1988-1994 baseline rates of 11% to not more than 5% of the population. The current estimated percentage of overweight children is 16% and as high as 24% in some high risk populations (United States Department of Health and Human Services National Center for Health Statistics, 2004).

Overweight children face an increased risk of compromised physical and mental well-being. Indeed, the consequences of childhood obesity are far reaching, implicating not only children, but parents, schools, communities and health care systems. Moreover, there is evidence that childhood obesity may become a lifetime sentence.

Pediatric providers are at the forefront of the effort to reverse these trends, particularly in the role of determining the breadth of the problem. Yet there is evidence that there are shortcomings to current childhood obesity monitoring practices. Advanced practice nurses are uniquely positioned to impact the problem through their dual role in research and clinical practice.

In an effort to begin to more effectively address childhood obesity, this thesis reviewed current literature on the existence and ramifications of obesity in children and healthcare provider growth monitoring practices and challenges, generally. The study focus was to describe prevalence of obesity in Montana's children; the current growth monitoring practices used by Montana providers, the barriers and challenges they face, and the opportunities researchers and clinicians have to reverse the occurrence of childhood obesity.

Background

The Centers for Disease Control and Prevention (CDC) estimates that childhood obesity has tripled since 1970 (National Heart, Lung & Blood Institute, 2006). Prevalence has increased across lines of gender, ethnicity, socioeconomic factors and region (Crawford, Story, Wang, Ritchie, & Sabry, 2001; Wang & Zhang, 2006). Internationally, childhood obesity has increased in countries as varied as Brazil, Germany, China and Australia (Wang, Monteiro & Popkin, 2002).

Overweight children are linked to increased incidence and earlier onset of many disease processes including, but not limited to type 2 diabetes, hypertension, asthma, dyslipidemia, sleep apnea, non-alcoholic fatty liver disease, orthopedic problems, depression and poor self esteem (Daniels, Arnett, Eckel, Gidding, Hayman, et al., 2005). Moreover, overweight children are associated with poor school performance and a higher frequency of risk taking behaviors (Neumark-Sztainer, & Hannon, 2000). Childhood obesity may also be a determinant for cardiovascular risk factors such as atherosclerosis

and left ventricular hypertrophy (Daniels et al, 2005; Freidman, Dietz, Srinivasan, & Berenson, 1999). Too, obese and overweight children often become obese adults with a greater risk of chronic disease and disability.

From a cost standpoint, obesity related diagnoses result in greater utilization of services and correspondingly greater healthcare costs (Oliver & Lee, 2005; Patterson, Moore, Probst and Shinogle, 2004; Popkin, Kim, Rusev, Du, & Zizza, 2006). Costs associated with negative stereotyping of the overweight child are more difficult to quantify, but it has been suggested that resultant impaired mental well-being does directly impact school and community resources (Daniels, 2006). When children are obese, the diseases start earlier and often last through adulthood, with projected implications of loss of productivity, missed work days, increased health care costs, decreased quality of life and shortened lifespan (Jackson, Doescher, Saver, & Hart, 2005).

Despite the obviously compelling nature of childhood obesity, pediatric providers are yet challenged to monitor a child's weight and intervene appropriately. A recent study by Barlow, Bobra, Elliott, Brownson, and Haire-Joshu (2007), demonstrated this point by finding that many providers are not regularly documenting body mass index (BMI) percentiles on age/gender specific growth charts. One reason for this may be a poor understanding of the standard measuring tool as it applies to children. *Adult obesity* is defined by body mass index (BMI), a calculation of weight in relation to height that remains fixed regardless of age and gender. Conversely, *childhood obesity* is defined as a percentile of a BMI range plotted on a growth chart that varies according to age and gender, specifically at or above the 95th percentile (*overweight* being defined as a BMI

range between the 85th and 95th percentiles). The CDC has created the gender and age specific growth charts using height and weight data compiled over the last 4 decades. These charts have been most recently updated using 2000 census data (Centers for Disease Control and Prevention, 2007).

Further confusion may be caused by the terminology used to describe children registering in the upper limits of age-appropriate weight. Researchers and clinicians frequently interchange the use of terms *obese*, *overweight* and *at-risk for overweight* to describe children who have an elevated BMI (Daniels et al, 2005; Wang et al, 2002; United States Preventive Services Task Force Agency for Healthcare Research & Quality [USPSTF], 2005).

Additionally, providers may be confused by the controversy that exists over the source of the data underlying the CDC's growth charts (Daniels et al., 2005; Wang, 2001; Wang, Monteiro & Popkin, 2002). Originally, BMI measurement guidelines for children were developed from National Health and Nutrition Examination Survey (NHANES I) data and were predominately based on non-Hispanic white children in the United States (USPSTF, 2005). More recently, researchers studying the global impact of childhood obesity have turned to growth chart data created from an *international* measurement of children, which may be appropriate for more diverse racial and ethnic populations (Wang et al., 2002; Whitlock, Williams, Gold, Smith & Shipman, 2005). This has created some difficulty in comparing data on childhood obesity and may cause confusion for providers trying to determine monitoring practices for children.

Finally, pediatric providers themselves identify additional barriers to monitoring and treating childhood obesity related to, parent and patient resistance, lack of time, lack of reimbursement and poor availability of efficacious interventions (Dorsey, Wells, Krumholz & Concato, 2005).

Little is known about whether the existing research on monitoring and treating childhood obesity corresponds to pediatric practices in Montana. Data on the percentage of overweight and obese children in Montana is varied and contradictory with Anne Casey Foundation (2004) indicating 27% of 10-17 year old children as overweight. This is contrasted to the Montana 2005 Youth Risk Survey produced by CDC (2005), which places 9% of high school students as overweight and 13% at risk for becoming overweight. The CDC National Survey of Children's Health (2005) presents Montana's elementary school children at 17.7% overweight and high school children from Montana at 9.3%. This is compared to an overall national average of 21.9% and 10.7%, respectively (CDC, 2005). While inconclusive, the statistics seem to mirror the national trend of the increasing prevalence of obesity (Anne Casey Foundation, 2004; CDC, 2005).

The ability to monitor Montana's children may be affected by rural health issues such as access, distance, and the existence of fewer specialists (Lee & Winters, 2006; Seldon, 2007). Indeed, a study by Seldon, which monitored the frequency of well child visits in comparison to the recommendations of the AAP, found that the incidence of well child visits by rural children is less than that of urban children (Seldon, 2007). Further study of Montana providers, many of whom are rural providers, is necessary to

understand current monitoring practices in this state; the prevalence of obesity; and, any barriers providers face in monitoring Montana's children.

The need for further study on the monitoring of childhood obesity echoes calls made by the World Health Organization, the Department of Health and Human Services, the Maternal Child Health Bureau, and the Health Resources and Service Administration for multi-disciplinary collaboration by health care providers, schools and communities to research and devise treatment guidelines to address childhood obesity (Krishnamoorthy, Hart, & Jelalian, 2006). Guided by nursing theory and evidence-based practice models, advanced practice nurses have the opportunity to play a key role in gathering knowledge and promoting strong practice guidelines for monitoring weight in children. Using up to date research, they can successfully prevent the occurrence of childhood obesity and promote healthier lifestyles for the young.

Significance of Study

Research on the measurement practices for childhood obesity provides insight into the providers who care for children, the children themselves, and the communities in which they live. By strengthening the understanding of current growth monitoring practices, more efficacious practices can evolve. By monitoring children's growth more effectively we can identify children who are at risk for poor health related to childhood obesity. Healthy children results in healthy communities, where the available resources match the needs. The significance for advanced practice nurses is that the opportunity exists to play a role in both the search for understanding of childhood obesity and the effective management of children who are, or who may be at risk of, becoming obese.

Statement of Problem

The problem broadly addressed by this research study involves the increasing prevalence of childhood obesity. Little is known about childhood obesity care and treatment practices of rural providers. This study described Montana pediatric primary providers and their current role for monitoring and managing obesity in children.

To summarize the problem, every year in Montana and across the nation, there are more children who are overweight or obese. As the prevalence continues to rise, so does the incidence of co-morbidities and poor health outcomes for these children. Early identification of children who are obese, or who are at risk for becoming obese improves health outcomes and may be reliant upon the monitoring practices of providers who care for children. In Montana there may be a gap in knowledge regarding current monitoring practices for childhood obesity which in turn reflects on the care offered to children. Therefore, information about current measurement practices offers a place to begin the task of reversing the incidence of childhood obesity.

Purpose

The purpose of this study was to explore current practices for measuring obesity in children by Montana primary care pediatric providers. The study was guided by the following research questions and contextualized by theoretical concepts from rural theory model.

Research Questions

A survey addressing the following research questions was sent to pediatric providers across the state of Montana to gather information about their growth monitoring practices for overweight and at-risk for overweight in children. The survey questions included:

1. What are provider demographics including location of practice within Montana (urban, urban cluster or rural), years of practice experience, gender, provider credentials, practice specialty (pediatric, family, migrant health, Indian Health Services) and number of children seen per day in practice setting?
2. What are provider practices for screening overweight and obesity in children including type of measurements used, who is performing measurements, frequency of evaluation, documentation of measurement, and how are measurements being utilized?
3. Are providers calculating BMI for children, and when BMI is used, how often is BMI measured, and is it plotted on age/gender specific growth chart?
4. What measurement are providers using to initiate diagnosis/treatment of overweight children, what treatment or intervention(s) result from this diagnosis, and is there a treatment protocol in place?
5. What are provider's perception of childhood obesity prevalence in their practice, what age group is most concerning, and what are the barriers to treatment and opportunities for reversing trends of overweight children?

Theoretical Framework

The conceptual framework for this research resides in rural theory. Concepts of rural theory acknowledge the variety of health seeking and health promoting behaviors unique to rural dwellers with themes of distance, isolation and limited health care access (Lee & Winters, 2006).

Rural theory offers a specific lens from which to view provider practices for monitoring childhood obesity in Montana. Research results may be enhanced by rural concepts which underscore the significance for many communities where children have limited access to health care and travel time to visit a provider creates family hardship and stress. Furthermore, concepts of rural theory may offer insight into the provider who may be a generalist in a small community. Generalists are described by rural theorists as providers who often work within an expanded scope of practice, where autonomy and isolation from other providers is the norm. Their roles must be flexible and expanded to meet a variety of needs within a rural community (Lee & Winters, 2006, p. 205-245).

In addition, rural theory was used for this study because Montana is designated a rural state and therefore research describing Montana provider practices for monitoring children's weight may be influenced by concepts specific to western rural culture. By the numbers, Montana has a population of over 957,000 individuals who reside in an area greater than 145,000 square miles; 46% of Montana's population live rurally; the average population density is 6.2 people per sq mile, but often as few as two people live within a square mile; 45 of the state's 56 counties are frontier counties, defined by their distance and time to populated areas, as well as their sparse population. Healthcare is often

provided at one of 40 rural health clinics (RHC) or 20 community health clinics (CHC) across the state and may be provided by practitioners who provide care for the entire family in one setting (Montana Department of Health and Human Services, 2004). Research by rural theorist suggest that while having a wide range of expertise, the primary care provider who is a rural generalist may offer limited specialty care due to their large scope of responsibilities and isolation from other providers and services (Loue & Quill, 2001).

Considering concepts of rural health, the United States Department of Health and Human Services Office of Applied Studies (2004) present findings that show rural residents, when compared to urban residents, may face barriers to high quality health care. Factors that contribute to poorer health outcomes for rural dwellers are higher poverty rates, a larger percentage of elderly, overall poorer health, fewer doctors, hospitals, and other health resources, and longer distances to reach health care delivery sites. Studies describing rural experience by Lee and Winters (2006), suggest rural residence may contribute to reliance on neighbors and family for health advice and emergency support.

In summary, childhood obesity, when studied in the context of rural themes, offers a broader understanding of the factors influencing children and the providers who care for them in rural communities and states. Slowing the trajectory of childhood obesity prevalence may be more achievable when research can be specific to a region and culture, but also can be generalized using theory concepts and models. Ideally each population, whether rural or urban, should be assessed with special emphasis given to

identifying those children whose access to health care is compromised by distance, economic or cultural inequities.

Definitions

Obesity

Obesity is defined as a complex, multifactorial chronic disease which involves the interaction of both genotype and environment. Integrating factors of behavioral, social, cultural, physiological, genetic and metabolic are involved. (National Heart, Lung & Blood Institute, [NHLBI], 2006). Overweight and obesity is determined by measuring Body Mass Index (BMI), a calculation of weight in relation to height. The formula: weight in kilograms divided by height in meters squared (weight (kg)/height (m)²). In adults, healthy weight is 18-25 BMI, overweight is 25-29 BMI, obese is a BMI of 30 or greater and morbidly obese is a BMI of > 40.

Childhood Obesity

The policy statement for the American Academy of Pediatrics defines *childhood obesity* using BMI as an indicator. BMI in children can be calculated using kilograms (kg) and centimeters (m) [$BMI = (\text{weight (kg)} \div \text{height (cm)} \div \text{height (cm)} \times 10,000)$] or pounds (lbs) and inches (in) [$BMI = \text{weight (lbs)} \div \text{height (in)} \div \text{height (in)} \times 703$]. Once the BMI is calculated, it is plotted using the Centers for Disease CDC growth charts (CDC, 2007). A BMI between the 5th and 85th percentile on an age/gender appropriate growth chart is considered healthy weight. A BMI between 85th and 95th percentile specific for age/gender is considered at-risk for overweight. A BMI at or above the 95th

percentile on age/gender specific chart is considered overweight or obese. The AAP advises use of clinical judgment to correlate measurement criteria to patients (American Academy of Pediatrics, 2007). Recommendations by various experts support use of the term “overweight” to be used instead of obesity, so children aren’t harmed by negative connotations of the label, “obese” (Flowers & Kahwati, 2004).

Rural

For purposes of this research, the definition of rural will correspond to the definition used by the United States Centers for Disease Control (CDC). Under that definition, rural areas comprise open country and settlements with fewer than 2,500 residents, essentially all people and places living outside densely settled territory. Urban areas comprise larger places and densely settled areas around them, with urban defined as consisting of cities of 50,000 residents or larger. Urban clusters delineates built up regions around towns or cities of 2500 to 49999 residents. This definition is taken from the United States Department of Agriculture, Economic Research Service (2004).

Children

For purposes of this study, *children* will be defined as boys and girls between the ages of 2 years old and 18 years old, of varied ethnicity.

Pediatric Providers

Pediatric providers will be a general term used to define primary care providers, general practitioners and pediatricians, including medical doctors (MD), doctors of osteopathy (DO), Physician Assistants (PA), and Nurse Practitioners (NP), who care

regularly for children. Providers surveyed for this study will be Montana CHIP providers who are identified as primary providers of children.

Health Disparities

The Health Resources and Service Administration (HRSA) define disparity as the racial, ethnic, socioeconomic, gender, education, disability, geographic and access differences specific to a population in the presence of disease and health outcomes (Rural Assistance Center, 2007).

Assumptions and Limitations

This study assumes childhood obesity arises from a complex interplay between environment and genetics. Childhood weight involves cultural norms and expectations as well as personal beliefs and characteristics of both patient and provider into the disease process, treatment and prevention. Providers might maintain certain biases regarding the concept and significance of overweight children. While seeking to set aside personal bias, it is assumed no new knowledge of the health care process withstands its impact. Finally this study is limited by size of participants, time and funding, mailed survey, and a newly adapted survey.

Organization of the Remainder of the Study

The second chapter will proceed with a review of the current literature on the prevalence of childhood obesity across the United States and the globally. Risks for excessive weight in children and the various behavior and environmental factors which

are thought to contribute will be identified. Much of the research review will focus on how primary and pediatric providers monitor, prevent and treat childhood obesity, as well as the various challenges associated with region of residence, ethnicity and race. Further study on rural theory will frame the significance of provider practice in Montana.

Chapter three will outline methods used to conduct this descriptive study about the current management practices used in Montana to identify and treat the overweight child. A description of the practical application of a pencil and paper survey administered to over 300 pediatric and primary care providers in Montana will follow. The method of determining a sample population, survey questionnaire and content validity will be described.

Chapter four will present results utilizing descriptive statistical analysis of each research question and the responses gathered from the survey. There will follow a discussion section in chapter five, where results and theory intersect to provide concepts and context so survey data can be understood from both a clinical and future research perspective.

CHAPTER 2

LITERATURE REVIEW ON CHILDHOOD OBESITY

Introduction

The review of literature for this study broadly focused on childhood obesity; its prevalence across the United States and around the world, as well as the cause and consequences related to children's health. Specific attention was given to studies presenting data on current diagnosis, management and treatment strategies used by providers. Moreover, the literature was examined for variables which may challenge providers and influence health outcomes for children. Many of the studies identified unique factors which may be linked to the continued rise of children's weight and associated co-morbidities. These included home and school environment, region of residence, race and ethnic culture. Rural theory was the construct used to frame childhood obesity and subsequent provider practices in Montana. Themes interrelated to rural theory were explored as they related to the child, provider, and the community when accessing health care, defining health, and promoting the prevention and treatment of childhood obesity. Key words used to research were childhood obesity *and*: activity, adolescent, BMI, cause, characteristics, consequences, culture, ethnic, health, international, measurement standards, nutrition, overweight, pediatrics, policy, prevalence, prevention, provider practices, race, rural, treatment, weight. Databases utilized were CINAHL, Cochrane Library and Medline.

Demographics

The 2004 National Health and Nutrition Examination Survey (NHANES II) surveyed 3958 children between the ages of 2 and 19 across the United States. The findings were compared with data from 2000 and earlier to look at prevalence trends for obesity. BMI for 17.1% of children were measured at or above the 95th percentile for age (Hedley, Ogden, Johnson, Carroll, Curtin et al, 2004). Using logistic regression, trends were adjusted for race, ethnicity and age and showed a significant increase in obesity for children and adolescents living in the United States between 2000 to 2004 (Hedley et al, 2004). An increase in childhood obesity has been noted in many countries, with China showing an increase of > 11 % of obesity prevalence and Great Britain's prevalence nearly tripling. Prevalence trends differ by race and ethnic origin for children (Ogden, Carroll, Curtin, McDowell, Tabak, et al., 2006; Wang, Monteiro, & Popkin, 2002).

In Montana, data from the 2005 Youth Risk Behavior Study shows 9% of high school students are overweight and 13% are at risk for becoming overweight. American Indian children in Montana are particularly at risk for obesity with prevalence more than twice as high as the general population (CDC, 2005).

Global Impact

Childhood obesity is not just a problem in the United States. It presented a shift globally from childhood under-nutrition to excess nutrition. In spite of variations of economic and environmental factors, most countries except Russia demonstrated similar average increases in prevalence of childhood obesity (Wang et al., 2002).

A study by Wang and colleagues used an international standard of measurement to illustrate weight patterns of children aged 6-18 years old in four countries; United States, Brazil, China and Russia. The measurement standard used was developed by the International Obesity Task Force (IOTF), which utilized BMI cut off points from data compiled of children from many countries. It also incorporated BMI measures derived from gender specific curves that pass through adult BMI curves at age 18 years of age. The four countries in Wang's study represented one fourth of the world's population. Analysis of the data demonstrated the trend of overweight and obese children is increasing in both industrialized and developing countries. While adolescents from the United States show markedly higher numbers of overweight prevalence, Brazil trends were similarly reflected. Russia did not show trends towards overweight but inversely demonstrated more underweight children. The authors felt socioeconomic hardship in that country over the last decade may contribute to the different results (Wang et al., 2002).

A scientific statement published by the American Heart Association identified data from two separate studies demonstrating how the prevalence of overweight children in Australia doubled from 1985 to 1995 (Daniels et al., 2005). Increases in childhood obesity have also been noted in Canada, United Kingdom, Germany, France and Finland (Lobstein, Baur, & Uauy, 2004), with rates of overweight children increasing across Europe by more than 400,000 cases per year. Among overweight children in Europe, three million are estimated as obese with eighty-five thousand new diagnoses yearly (Lobstein et al, 2004).

Causes Contributing to Childhood Obesity

Attempts to understand the widespread increase in childhood obesity leads to the question of causation. While genetics play a role in childhood obesity, the gene pool does not change rapidly enough to account for the global prevalence of overweight children. Much of the research reviewed for this study sought to understand treatable causes for childhood obesity by investigating the intersection of environment and behavior.

Fierro (2002), author of the Centers for Disease Control Guidelines, stated in his health policy summary, “poor nutrition and physical inactivity are the leading causes of obesity and represent the best opportunities for prevention and treatment” (p. 3). His conclusions indicated that an abundance of fast food, fewer homemade meals, and increased soda pop consumption are factors contributing to childhood obesity.

A study by Anderson and Butcher (2006), also demonstrated a correlation between elevated BMI in children and soda intake. The nutrition empty, high calorie drinks, contribute to an energy imbalance secondary to availability, ease of consumption and its replacement of other, more nutrient laden substances. This same study identified breast feeding, while not a consistent factor, as having a lowering affect on children’s overall weight. Moreover, the research found that very young children seem capable of adjusting their food intake to match their energy outflow. As children grow up their food intake becomes more reliant on external cues, such as the amount and type of food presented.

Still other studies concluded that a child’s environment contributes to obesity. With increased availability of snack foods, less physical education in schools, and

increased screen time (computer and television viewing), the environment promotes imbalance of energy intake and expenditure resulting in more overweight children (Zhang, Christoffel, Mason, & Liu, 2006).

The *built environment* is a newly coined phrase used to describe many neighborhoods where children are being raised. Studies described built environments as developed neighborhoods where schools and playgrounds do not exist within walking distance; there is a dearth of sidewalks; and clusters of fast food restaurants and convenience shopping are close at hand. The result is increased car time and easy access to nutrition poor food. Research demonstrated that this may have further contributed to higher trends of childhood obesity (Sallis & Glanz, 2006).

Television viewing was the focus of a study by Robinson (1999) who sought to impact survey results by American parents who reported greater than 4 hours per day being spent by children in front of a screen (TV, computer, and video games). This study was conducted over one school year and involved 2nd and 3rd graders. After an educational intervention promoting decreased screen time, the children averaged a reduction of nearly one third of viewing time as compared to their peers resulting in significantly decreased waist size and BMI over the course of the study. Interestingly, less screen time correlated with less calories consumed in the form of snacks.

Consequences of Childhood Obesity

An understanding of cause cannot have value unless the health consequences associated with childhood obesity have been enumerated. Childhood obesity has been

shown to carry varying degrees of emotional, social, physical and economic consequences. Many consequences are far reaching, lasting well into adulthood.

Emotional cost for overweight children is described as changes in wellbeing. Psychological problems are cited by some researchers, as the most common short term consequence of childhood obesity. Depression, eating disorders and loss of quality of life have all been linked with childhood obesity. A review of literature estimated binge eating as high as 30% in overweight girls. Furthermore, decreased quality of life scores in children have been accompanied by poor school performance for children ages 9-12 ((Fowler-Brown & Kahwati, 2004; Williams, Wake, Hesketh, Maher, & Waters, 2005).

Social consequences associated with overweight children are poor self esteem and peer difficulties associated with being teased or marginalized (Neumark-Sztainer 2002; Strauss & Pollack 2003). Researchers, who have studied adolescent weight in relation to risk behaviors, found that almost half of adolescent girls in their study had at some time been on a diet. Thirteen percent of overweight girls and 7% of overweight boys reported disordered eating, with strong correlates to low self esteem, suicide ideation and substance abuse in the same population (Neumark-Sztainer & Hannan, 2000). A perspective on childhood obesity published in the New England Journal of Medicine linked the social isolation of overweight children to increased rates of college drop-out and a higher rate of adult poverty (Ludwig, 2007).

Physical consequences for overweight children are associated with increased risk for complex disease processes; type 2 diabetes, metabolic syndrome, dyslipidemia, sleep apnea, asthma,, hypertension, gastroesophageal reflux disease (GERD) and many

orthopedic problems (Anderson & Butcher, 2006; Dilley et al., 2007; Eissa & Gunner, 2006; Neumark-Sztainer & Hannan, 2005; Ogden et al., 2002; Wang, 2001). Overweight children have been linked twice as often to diabetes when compared to non-obese children (Hawley et al, 2006)). These diseases have been found to occur earlier and with more frequency in children who are obese (Fowler-Brown & Kahwati, 2004).

A study conducted by Freedman examined the relationship between children's BMI measurement and cardiovascular disease (CVD). Using seven cross sectional studies spanning more than 20 years, data was analyzed from 9000 children, ages 5-17. The study demonstrated that risks linked to CVD (elevated lipids, insulin and BP), increased with weight > 95th percentile. When compared to non overweight children, fifty-eight percent of overweight children were found to have one cardiovascular risk factor, while over 50% were found to have two risk factors for cardiovascular disease. Furthermore, study findings demonstrated overweight children were 2.4 times as likely as children measuring <85th percentile to have elevated total cholesterol; 4.5 times as likely to have elevated systolic blood pressure; and 12.6 times as likely to have elevated fasting insulin (Freedman, Dietz, Srinivasan, & Berenson, 1999). The importance of these findings are emphasized by American Heart Association statistics which identify cardiovascular disease as being responsible for one out of every 2.8 deaths, per year in America (American Heart Association, 2004).

More recently childhood obesity was shown to increase the likelihood that the consequences will be long term, leading to adult obesity and is associated with diverse and complex co-morbidities. Research and evidence synthesis by Whitlock et al. (2005)

found 19 fair or good quality longitudinal studies which demonstrated BMI measurements in childhood correlate more closely with adult obesity than other measurement standard. A 50% or greater probability of adult obesity is seen in overweight children >13 years old, and children with BMI >95th percentile.

Far reaching adult consequences for overweight children were also predicted by researchers of childhood obesity and heart disease. They estimated future prevalence of adult obesity related coronary heart disease (CHD), using a computer program, historical trends of overweight adolescents leading to adult obesity, and the CHD policy model. Their analysis resulted in predictions of adult obesity as high as 44% in adults in 2020 which would correlate with an earlier and increased incidence of CHD related events and death. Furthermore, by 2035, they projected an excess of 100,000 cases of obesity related heart disease. While noting many factors could offset this trajectory, the authors concluded that childhood obesity carries consequences for future adults of substantial morbidity and mortality (Bibbins-Domingo, Coxson, Pletcher, Lightwood & Goldman, 2007).

The affects of childhood obesity create an economic impact secondary to co-morbidity related clinic and hospital visits, medications and treatments, while the long term sequela of adult obesity involves costs associated with paid sick leave, life insurance, disability insurance and lost years of productivity. The rise in overweight children carries a threefold increase in pediatric economic burden with hospital costs associated with pediatric obesity at 127 million dollars annually (Wang & Dietz, 2002). Public health

expenditures related to adult obesity are expected to exceed ten percent of total health care cost in the United States this decade (Oliver & Lee, 2005).

Current Provider Practices

Trends in childhood obesity prevalence may be linked to provider's ability to diagnose and intervene for children who are above average for weight. A review of literature on what is currently being done by providers to address children's weight found studies which suggested that providers rarely counsel overweight children (Dilley et al., 2007; Dorsey et al., 2005; Scott, Cohen, DiCicco-Bloom, Orzano, Gregory et al., 2004).

A comparative case study of 633 primary care encounters occurring in community based clinics in the Midwest observed patient provider encounters over a four week period. The clinics represented the spectrum of health care; urban and rural, solo and multi-practitioner, independent and part of large health systems. Findings demonstrated how 35% of children seen were overweight, while 8% were counseled about their weight. For all ages observed, discussion of weight loss was initiated when the patient brought up desire to lose weight or when the physician framed weight as a medical problem. Often this was observed in relation to a changed measurement or lab value. Authors of this study state in their conclusion "in the vast majority of encounters, neither clinicians nor patients mentioned the patient's weight at all, even for those patients who were visibly obese and who were being treated for acute or chronic conditions that would be improved by losing weight" (Scott et al, 2004; p. 826).

Other researchers looked at 600 children visits at four separate community clinics over a period of one year. The children were of varied race, gender and age, with the majority (84%), receiving Medicaid. Over 39% had height and weight measurements calculated as BMI $\geq 85^{\text{th}}$ percentile. Of these 239 children, 0.5% had documented BMI, 20.5% had documented diagnosis, and 16.9% had documented treatment. The most common treatments of diet and exercise were stated as general advice such as recommend diet or increase exercise (Dorsey et al, 2005).

The Pediatric Research Group looked at 13 diverse pediatric primary care practices over fourteen months through parent surveys and chart analysis. Children in this study were two years old or older, with a mean age of 7.9. Race was diverse with 43% white, 34% Hispanic, 18% Black and 5% other. From a sample of 1216 children, approximately one fourth of obese children ($\geq 95^{\text{th}}$ percentile) and 15% of overweight children ($\geq 85^{\text{th}}$ percentile) were managed for overweight conditions. Counseling for diet and exercise did not differ for patients regardless of BMI. This study found older children and children with highest BMI were more likely to be identified as overweight. Statistical analysis of this study indicated there were increased odds for every one year of age and one point increase in BMI. By contrast, once identified and diagnosed as overweight, children were more likely to receive overweight intervention (54%). Their conclusions were “For children in all BMI categories combined, diagnosis of a comorbid condition was more likely if an overweight diagnosis was documented” (Dilley et al., p. 152, 2007).

Literature showed that controversy exists over the benefit of treating overweight children and adolescents in clinic settings. While Scott and colleagues felt primary care

providers had a unique opportunity to positively impact children's weight (Scott et al., 2005), a meta-analysis and evidence synthesis by Whitlock (2005), found little significant benefit for improving obesity outcomes with clinic interventions. The study authors hypothesized, that for children of all ages, there is limited evidence that intervention of behavioral counseling or referral is helpful. They further concluded that there is limited data available from primary care provider settings on childhood interventions focused on the 2-5 year olds, nonwhite children and children > 12 years old; limited knowledge of normal childhood body and adipose composition, which may hamper the sensitivity of standard measurement tools; limited standardized BMI cut off points for children of different ethnicity and race. They call for more clinically relevant studies addressing the gap in knowledge of basic provider strategies (Whitlock, et al., 2005).

Other researchers described a recent qualitative study focused on provider's use of BMI in several pediatric and family practice clinics in North Carolina. This study sample was comprised of 38 providers, many who were pediatricians. Study findings demonstrated that providers who have in place an Electronic Medical Record system are more likely to use BMI measurements because they are automatically made available when height and weight are entered into the program. Those not having access to EMR faced multiple barriers; time to calculate BMI, unavailable data or tools to calculate BMI, and the burden of extra time necessary to plot BMI. Providers state that a "laundry list" of items must be covered at each visit and child's weight was only one of many concerns. Further barriers cited by this study include poor evidence showing BMI accuracy in identifying adiposity for all children, lack of knowledge about the calculation itself,

inconsistent measurements obtained by staff, and unavailable management and treatment protocols (Flower, Perrin, Viadro & Ammerman, 2007).

Assumptions of rural theory may intersect with provider practices for monitoring children's weight in Montana and were reviewed as a factor which may contribute, if not to the management of childhood obesity, then to the risk of poorer health outcomes.

Literature reviewed on rural theory suggests Montana has a rural population secondary to its overall sparse population. Concepts of rural theory may need consideration in order to understand a Montana provider's ability to identify and care for overweight children.

First, urban models for health care may not be appropriate or adequate for meeting the needs of rural children. Secondly, healthcare in rural communities may be less accessible and therefore more informal using friends and family. Thus opportunities by providers to address children's weight may be fewer. Finally, there is an assumption by rural theorists that providers are generalists offering a broad range of expertise, but perhaps less specialized with regards to pediatrics (Lee & Winters, 2006; Loue & Quill, 2001). This contrast to current research by Chung suggesting barriers to childhood preventative care may be offset by continuity of care or having a consistent medical home. This could be area of strength for rural communities who offer stable providers with longevity of current practice setting (Chung, Lee, Morrison & Schuster, 2006).

Finally, a review of an important obesity guideline (United States Preventative Services Task Force [USPSTF] 2005), further illustrated the challenges providers face when determining the best prevention and care for overweight children. The USPSTF concluded that there is insufficient evidence either *for* or *against* routine screening for

overweight and obesity in children as a way to prevent adverse health outcomes. While they cite fair evidence supporting how an elevated BMI in children > 8 years old increases risk for adult obesity, they also provide rationale for insufficient evidence supporting behavior interventions in children to impact elevated weight. Moreover, the recommendation cautioned they cannot rule out evidence of harm to children being screened and treated for overweight. The USPSTF recommends further research to improve the standard definition for childhood obesity and to provide research on effective clinical approaches to screening and treatment of childhood obesity.

Treatment and Prevention

Once childhood obesity is identified, the provider must determine best care for the treatment of an overweight child and further evaluate for associated co-morbidities. Review of the literature suggested there are few guidelines and protocols for successful intervention. Complex factors complicate both the treatment and prevention of childhood obesity which often must have the support of parents, schools and communities. Moreover, there is little evidence available to providers to support management of the overweight child ((Daniels et al., 2005; Golan & Crow, 2004; Hawley et al., 2006).

A multivariate analysis of a large cohort study from the United Kingdom, the Longitudinal Study of Parents and Children, identified early growth related risk factors associated with childhood obesity. The authors hypothesized that an understanding by provider of early risk factors could lead to improved prevention strategies. Risks for childhood obesity proposed by this analysis included; increased birth weight; maternal

smoking between 28 and 32 weeks gestation; bottle feeding; one or more parents who are obese; poor sleep schedules for children (< 10.9 hours/day); increased television viewing > 8 hours /week by children; and a pattern of increased dietary intake of junk food. Knowledge of the risk factors which may contribute to obesity in children allows the primary care provider opportunities to offer anticipatory guidance during clinic visits (Reilly, Armstrong, Dorosty, Emmett, Ness et al., 2005).

Researchers suggested the most extensive treatment currently used by primary care providers for childhood obesity is behavioral counseling. Behavioral counseling includes education on diet and exercise. Often the intervention is directed at both the child and parent. Golan and Crow (2004) conducted a study and reviewed a family based health center intervention directed at overweight children. The original behavior counseling was directed at parent education versus a control of child directed education. Seven years post intervention a follow-up study determined weight reduction in the parent education group as 29% compared to 20% in the children only group. The authors felt long term weight loss in children was better treated through parent involvement.

Family support was also researched by Daniels et al. (2005) who described current provider practices as too short-term for significant childhood weight loss. "With its emphasis on acute short-term interventions, contemporary healthcare delivery is often not well suited to meet the long term needs of overweight children and their families (p. 2007). Daniels et al. summarizes that treatment should be tailored to the individual with consideration to cultural, socioeconomic and living environment differences, as well as age, presence of comorbidities and severity of overweight. The researchers suggested that

the best prevention strategy comes from joint effort by community, government policy makers, insurers, health providers, schools and food industries.

Research conducted by the International Obesity Task Force concluded that evidence for effective prevention and treatment strategies of childhood obesity is poor. A scientific review found only 10 trails of sufficient size, quality and duration to provide data on current interventions. Three of four long term studies used diet and physical activity intervention, but found this did not support long term improvement for overweight children. Two studies showed a multimedia approach to diet change appeared effective, while another long term study demonstrated physical activity had slightly greater rate of weight reduction (Lobstein et al, 2005).

Further review of literature suggested there needs to be clear differentiation between prevention and treatment. Prevention involves population based intervention involving schools, communities, policy change and individual behavior change. By contrast, treatment of childhood obesity focuses on clinic interventions to reduce adiposity in overweight children. A review of nine random controlled trials by investigators found modest evidence in support of behavior based intervention of diet and exercise modification. The author recommended limited optimism regarding this analysis based on the rationale that sample population was volunteer and interventions may have been more “intense” than typical of routine primary care interventions. Moreover, limitations of the studies were cited as too few control subjects (Fowler-Brown & Kahwati, 2004).

Hawley et al. (2006) conducted an intervention for overweight children living in a rural community. They combined a survey and a pilot intervention to investigate how family involvement within a small community influence treatment of childhood obesity. The authors hypothesized that children in rural communities may face unique challenges of limited resources and access to existing resources because of distance, transportation availability, and economic issues. The survey identified key factors thought to be important when involving communities in the treatment and prevention of overweight children. The factors included readiness for behavior change; improved identification, assessment and treatment of obesity in young people; interventions incorporated into school days to avoid access and transportation issues; community created network of key resources to support children and families; and target population involvement in physical intervention through non-organized sports. The authors of this study concluded that both environment and individual factors facilitate change in childhood obesity. The pilot project utilized both community and family support to positively impact children's weight. Hawley et al. (2006) suggested that future interventions could be based on reducing access of children to unhealthy food and drinks.

This research illustrated the influence of rural families and communities on treatment of childhood obesity. Individuals living in rural areas often have more intimate relationships and offer support of one another in times of need. These connections within a stable community allow a give and take which can support and sustain quality of life. Health care prevention and promotion should combine individual focus as well as focusing on aspects of family and community interaction (Loue & Quill, 2001).

In conclusion, while no evidence based guidelines exist for monitoring and treatment of childhood obesity, general guidelines and recommendations have been published by the American Academy of Pediatrics, the American Heart Association, and the American Medical Association. The most succinct guidelines were published by the National Initiative for Children's Healthcare Quality (2007). This protocol was compiled by a committee of experts from various organizations involved in children's health outcomes (CDC, Maternal and Child Health Bureau, US Department of Health and Human Services, and Health Resources and Service Administration), and recommends providers screen and intervene as early as age two in overweight children with medical complications, and by age 7 in children without complications. The guidelines further suggest that treatment interventions should involve the family or primary caregiver and other community or professional resources as necessary and available. Providers should emphasize education on health risks of becoming overweight and behavior changes regarding calorie consumption and physical activity (Fowler-Brown & Kahwati, 2004).

Urban versus Rural Factors

The prevalence, consequences and management of childhood obesity may be further complicated by geography and whether a child lives in a rural or an urban environment. While specific research is limited regarding overweight children, a recent analysis attempted to qualify child well-being secondary to where they lived. Researchers demonstrated children living in non metropolitan neighborhoods had poorer health and lack of reliable access to health care (Turner & Kaye, 2006).

A meta-analysis by Seldon (2006) found the percentage of overweight children who comply with well-child visit recommendations are less than children of normal weight. More concerning for Montana, the same study found well child visit compliance varied by region with the mountain states region of Montana at below 50% compliance for well child visits. The author called for further research in this area while suggesting fewer providers in rural states may result in fewer children seen for preventative care.

Further research on the rural/urban factor was undertaken in Georgia where a statewide survey determined the prevalence and severity of overweight children. The data demonstrated that a higher prevalence of overweight children lived in rural areas when compared to urban and suburban communities. The authors felt their results were comparable to findings from a study in North Carolina where rural children 8-9 years old, were 54.7% more likely to be overweight than urban children. This finding held true in North Carolina when controlled for race, family income and parent education (Lewis, Meyer, Lehman, Trowbridge, Bason, et al., 2006). The research from the Georgia study was inconclusive whether the prevalence of obesity in the rural regions was directly correspondent to race and income. Authors of the study felt other unknown factors unique to rural dwellers, could contribute to an environment where increased intake and decreased activity are more likely. They cited transportation, distance and safety as factors worthy of further exploration (Lewis et al., 2006).

Other research correlated neighborhood culture patterns, children's physical activities and socioeconomic factors in relation to childhood obesity. Six unique neighborhoods with differing characteristics were identified: 1) rural working class, 2)

exurban, 3) newer suburban, 4) upper, middle class older suburban, 5) mixed race urban and 6) lower socioeconomic status (SES), inner city. The study population consisted of 7-12 graders from over 80 high schools and 50 middle schools. Neighborhood characteristics surveyed were location, availability of physical facilities (parks and recreation centers), walk -ability, road type and crime/safety issues. Results indicated rural, exurban and mixed race urban adolescents were 30-40% more likely to be above the 95th percentile of gender specific growth charts independent of age, SES and race (Nelson, Gordon-Larson, Song and Popkin, 2006). The authors of this study found results consistent with other studies. Rural, low SES and ethnic populations demonstrated lower levels of physical activity and higher incidence of overweight and obese. The discussion summary called for more research into the interaction of neighborhood function and adolescent health behavior, especially as it applies to rural dwellers. “While traditional risk factor analysis provides important insights into the association between environment and behavior, these findings show that broad, traditional measures of neighborhood characteristics (e.g. median household income) may not capture the fine grain detail and complexity needed to better understand how environments influence behavior” (Nelson et al., 2006, p. 116).

Access to health care is a rural issue explored by Dennis and Pollotta (2001). The authors identified long distances to health services, few specialty clinics, and fewer individuals with health insurance as contributory to increased chronic diseases in rural populations. In addition, rural areas show less use of preventive services. These variations in defining rural and the many differences among rural communities across the

country make it more difficult to understand child health as it relates to their rural residency.

Many of the studies reviewed were non-specific to both children *and* obesity, and had limitations when stratifying for factors of age, gender, region and race; yet still presented important data which supported the general hypothesis that non-metropolitan populations have a higher risk of obesity and poorer health outcomes associated with being overweight.

The Eight Americans Study looked at health disparities by region, but not did not specify for obesity or children (Murray, Kulkarni & Ezzati, 2005). Research by Patterson, et al. (2004) support a link between rural populations and poor health behaviors but did not specifically study children. Jackson et al. (2005) found that while higher education levels have a positive effect on obese individuals living in urban setting, it made only a slight difference for rural residents. Anderson & Butcher (2006) found increased association between childhood obesity and African-American and Hispanic race, low income and by region, with the south and west regions demonstrating more obese children. Data from a study in Kansas supported how rural communities are aware of importance of good nutrition and physical activity, but may be limited in their ability to change behavior because of accessibility, distance, limited health resources and economic hardships related to weight and eating interventions (Hawley, et al., 2006). Furthermore, research by Jackson et al. (2005) concluded that when linked to census designations nationwide, obesity prevalence was lowest in urban counties and highest in adjacent rural or non adjacent rural counties.

Risk factors associated with rural residents which may contribute to higher prevalence of obesity included increased sedentary lifestyle, lower compliance with dietary guidelines, fewer community support systems, lower education levels, poorer general health and increased smoking (Patterson, et al., 2004). Jackson et al. (2005) found that while higher education levels have a positive impact on obesity in urban settings, it made only a slight difference for rural residents. Furthermore, constructs of rural theory suggest there are unique perceptions of rural health and the requirements of practitioners when treating residents in rural settings. Concepts of health status, health beliefs, distance, self reliance and informal care systems may factor into the cause, consequences and treatment of childhood obesity (Lee & Winters, 2006). This data, while not always specific to children, does create a foundation for further studies to explore rural factors which contribute to childhood obesity by region, race, culture and age.

Race and Ethnicity Factors

Race and ethnicity also may be a factor affecting weight in childhood. An analysis of available data from the NHANES study by Kumanyika and Greer (2006) find rates of obesity for children ages 6-11 and 12-19 are significantly higher for African American and Mexican American Children. Data further demonstrated nearly 25% of adolescent Mexican American boys are obese as compared to 15% of whites. For girls, African American teens have the highest incidence of obesity at 24%, compared to 13 % of white adolescents. The authors also reviewed a study of 12,000 Native American children and found prevalence of obesity at 22% for boys 5-17 years old and 18% for girls. Research

conducted in seven American Indian communities placed statistics of prevalence as high as 26.8% for boys and over 30% for girls with mean age of 7.6 years.

A study by Kimbro, Brooks-Gunn, & McLanahan, (2007) concluded that obesity risk was highest in Hispanic children; children of obese mothers; and may present as early as 3 years of age.

Race was also identified as a factor in research conducted with the Navajo tribe in New Mexico. The study demonstrated the prevalence of diabetes in adolescents rose to 106% from 1990 to 2001. Navajos with diabetes were almost three times as likely to be overweight. Researchers indicated that diabetes and overweight statistics follow trends in this indigenous population following the loss of traditional culture: diet, hunting, farming, active lifestyles, and the adoption of Anglo-American diet. Notably, fruit and vegetable consumption was less than once, per person, per day (Lombard, Forster-Cox & O'Neil, 2006).

A comparison study of three generations of Native American families and African American families looked at the relationship of BMI, television viewing and activity levels through the cross section of ethnicity, family and culture. Forty-four Native American and 40 African American families were recruited from rural Oklahoma and surveyed on socio-economic status (SES), health, diet and physical activity. Results found Native American families (adults and children), had significantly higher mean percent of body fat than African American families. Children in both groups reported higher levels of physical activity at 10 minutes of activity per day, and 16-21 hours of TV viewing per week. African American families reported diets higher in fat as compared to

Native American group. Authors of this study cited limitations related to size of study population, but concluded African American and Native American children are at greater risk for overweight and obesity and should be a priority in prevention (Polley, Spicer, Knight and Hartley, 2005).

Literature Review Summary

Concepts of childhood obesity are complex and multifactorial. Although no clear relationship between cause and prevalence has been identified it is clear from this review that consequences are both short and long term and carry risk of negative social, financial and physical outcomes. Data specific to varied regions, race, ethnicity and age suggested these factors have varied impact on growing trends of overweight children. More specific studies are needed to determine which variables are significant and to determine treatment and prevention aimed at specific regions or populations. Studies demonstrated primary pediatric providers may be under treating overweight children. To better overcome barriers to management of overweight children, an understanding of standard surveillance practices is needed as well as evidence supporting effective prevention and treatment strategies. For Montana providers, specific studies identifying rural factors which contribute to children's health outcomes could help establish intervention guidelines for overweight children. Advanced practice nurses can take a pivotal role to implement the prevention and treatment of childhood obesity in a timely and culturally sensitive manner.

CHAPTER 3

METHODS

Overview

The objective of this study was to describe current practices for monitoring overweight children by Montana primary care, pediatric providers. A descriptive, cross sectional design was utilized to document the demographics, behaviors, and perceived challenges experienced at this current point in time by Montana pediatric providers. The guiding purpose of this investigation was to better understand the obesity monitoring practices and care of overweight children in a rural state.

Data was gathered using a 22-question pencil and paper survey, which was mailed to 300 providers across the state of Montana. The sample was randomly chosen from a population of over 900 primary care providers, who are listed as pediatric primary providers for children insured by Montana's Children's Health Insurance Plan (CHIP). Survey results were entered into a secure Montana State University database (SNAP) and then transported into the Statistical Analysis System (SAS) for integrated analysis. Ethical guidelines were rigorously followed during the course of this study which was reviewed and exempted by Montana State University Institutional Review Board. A complete accounting of methods used for this study will follow under concept headings of design, instrumentation, ethic considerations and analysis.

Design

A descriptive study design was chosen to discover what Montana pediatric providers are doing to monitor and manage children's weight and to document the challenges of those practices. Descriptive research is derived from a broad class of nonexperimental studies with the purpose of describing characteristics of a phenomenon as it is occurring. Descriptive research was the most direct and economic choice to begin to understand how childhood obesity is managed by providers in Montana and to further develop concepts interrelated with rural theory and children's health.

The instrument, a mailed survey, included 22 questions (see Appendix A: Pediatric Provider Childhood Obesity Survey). Because an instrument specific to the research questions could not be found, a survey tool was adapted. The new instrument incorporated concepts gleaned from personal clinical experience, review of current literature, and content from a survey used by the Missoula City County Health Department to investigate local provider childhood obesity practices. Content validity of the instrument, the degree to which the instrument appropriately samples provider practices for overweight children, was established by an evaluation of the survey content by a panel of clinical experts including three nurse practitioners.

Once the content validity of the questionnaire was established, the survey was mailed to Montana primary providers who care for children under the Children's Health Insurance Plan (CHIP). This sample population was chosen for several reasons. First, this group represents providers who care for children of all ages across the state of Montana. Thus a comprehensive picture could be established which represented data from

providers and children from most communities and regions across the state. Secondly, the CHIP providers are easily accessed through an online government database. The complete list of CHIP providers, classifies primary caregivers of children by type of provider (physician, nurse practitioner, physician's assistant and doctor of osteopathy) and address/location of practice. Finally, a study utilizing data from this group of providers and children could result in timely information being made available about a potentially vulnerable population within the state.

To verify practice focus, the complete list of CHIP providers was specifically narrowed to include only primary pediatric providers, as defined by the executive director of the program. This included *all enrolled providers who are listed on the website offering pediatric, family practice or general practice to children* (personal communication with Jackie Forba, 9/13/07). These providers included medical doctors (MD) and doctors of osteopathic medicine (DO) who specialize in pediatrics or family practice, family nurse practitioner (FNP), pediatric nurse practitioners (PNP), and physician's assistants (PA) practicing in primary care settings, migrant health clinics and Indian Health Service clinics.

CHIP providers care for almost 15,000 of Montana's children from birth to age 19 years old. Children eligible for Montana's CHIP program are those who are state residents, uninsured, U.S. citizens or qualified aliens, not eligible for Medicaid, living in a household who qualifies by income, and children whose parents do not work for the state of Montana or Montana university system (Montana Department of Health and Human Services [DPHHS], 2007). Providers eligible to offer care through Montana's

CHIP program have participated in an enrollment and training process with Blue Cross/Blue Shield of Montana (BCBSMT), and have provided proof of licensure, certification, accreditation or registration according to Montana state laws and regulations. Providers agree to treat CHIP patients without discrimination by providing enrollees the same opportunities for timely appointments and treatment as other patients, offer 24 hour emergency care, urgent care/same day appointments, non urgent care /within 10 days, immunizations and routine preventative care within a timely manner (DPHHS, 2007).

A complete list was compiled of Montana CHIP providers who could be defined as primary providers for children. The final sample was then randomly selected from the total 918 providers by the random generator for Microsoft Excel with 300 providers chosen using this mechanism; of the providers chosen, 134 were males and 166 and females; 146 were MDs, 82 were FNPs, 58 were PAs and 14 were DOs.

A letter of introduction and request for participation (see Appendix B) was mailed with the survey and a self addressed, stamped, return envelope. The letter invited participation and provided for informed consent with return of the survey. Participation was both anonymous and voluntary. The letter further instructed on the simple process to complete and return the survey within a period of six weeks from mailing. Finally, the letter included contact information for both the student investigator and the committee chairperson and an opportunity to request results from the study. The survey was mailed out in mid-November, 2007, with a proposed timeline of 6 weeks to for surveys to be completed and returned.

Research demonstrates that mailings have returns of 24 to greater than 70 percent (Dillman, 2000; Medlin & Whitten, 2001). Higher return is expected when using a method where the initial mailing is followed by postcard, e-mail or fax reminder. Dillman (2000) reported that response rates for mailed surveys increase with the application of follow-up measures while also increasing the cost. A study by Medlin and Whitten (2001) found response rates for mailed surveys between 30.11% and 47.3%. Author Dillman in the Tailored Design Method documented how his methods on mailed, self administered questionnaires generated return yields ranging from 58-75%. The process included an introduction letter, self administered survey, a post card reminder and if necessary, a second mailing.

The current study utilized a one time mailing without follow-up postcards, knowing the limitations of time and money might increase the non-response rate. The time of year of the mailing was also a concern, as the survey was sent out over the holiday period between mid November and the end of December. Return of completed surveys was 85 out of 300 or a 28.7% return response.

Once returned, data were entered into Montana State Universities Snap software and converted to SAS program for analysis and interpretation. Descriptive statistics were applied to data for each research question and factual presentation of the results includes illustrations using tables and figures. Finally, a thoughtful discussion of the significance and meaning of the results was undertaken in chapter five. Themes and concepts derived from the quantitative data and analysis of spontaneous responses was integrated with concepts of clinical knowledge, suggestions for future research and theory development.

Meaning was assigned to the results by asking questions of each finding; what are the results; what does this mean; what are the limitations that could threaten reliability; how does it compare to prior knowledge; and are the findings useful for providers, researchers and theorists. Results were also explored using themes derived from rural theory of distance, health care access and isolation.

Instrument

As stated earlier, this study utilized a pencil and paper, mailed survey to gather quantitative data for descriptive study of the phenomenon and research questions. How do Montana providers manage childhood obesity? The survey consisted of 22 close ended questions and offered several response choices, ranging from two to eight. Spontaneous responses were allowed in the survey under *additional comments*. The questionnaire was comprised of three major sections; (a) demographics; (b) measurement type, frequency, and documentation; (c) the respondents perception of childhood obesity prevalence; and (d) challenges, treatments and future prevention strategies needed. More specifically, the survey addressed the following research questions

1. What are provider demographics: location of practice within Montana (urban, urban cluster or rural), years of practice experience, gender, and provider credentials and specialty (pediatric, family or general practice)?

2. What are provider practices for screening overweight and obesity in children: type of measurement used, who was measuring child, frequency of evaluation, documentation of measurement?

3. Are providers measuring BMI and plotting on age/gender specific growth chart and if so how often?

4. What treatment interventions result when a child is identified as overweight or obesity in child and is there a treatment protocol in place?

5. What are provider's perceptions of prevalence of childhood obesity in their practice, what age group is most concerning and what barriers and opportunities exist to monitor and manage obesity in children?

Content Validity

Content validity of the study tool was established utilizing the expertise of three advanced practice nurses who provide care to children in a primary care setting. The experts each reviewed the questionnaire and scored it according to its relevance, clarity, organization and completeness to the topic of children's weight management. The scoring index was measured as 1-4 scale, *with 1=not relevant, 2=somewhat relevant, 3=quite relevant and 4=very relevant*. The return scores were 86/88, 86/88 and 75/88. Each scorer offered comments which differed from the others. No two experts came to the same conclusions with their scoring. Expert one suggested narrower age ranges for question 9 which asks whether BMI is measured. Expert two commented how a rapid change in BMI could trigger intervention and made the additional observation that many children are seen every 3-4 years instead of annually for wellness evaluations. Expert three did not comment at all but scored: two points each for questions on education background, gender and who performs the measurement in the office; three points each on questions about number of years in practice, how often measurements are taken, how

BMI is calculated, how often BMI is measured, where BMI is recorded, what age is of most concern, how does this compare over the last five years and what are the respondent's perception of strategies to reduce prevalence.

Overall, the Content Validity Index (CVI) scores reflected a positive response from the review panel. Therefore the Pediatric Provider Childhood Obesity Survey remained unchanged as reflected by panel majority scores per each question of (3), quite relevant or (4) very relevant.

The advantages of using a mailed survey for this study were time flexibility and the relative economy for obtaining information from a widely distributed population. The mailed survey was used to explore the specific scope of provider practices in Montana, while still obtaining data on prevalence, and relationship among variables enumerated by the research questions. The questionnaire was self-administered and was considered appropriate for the reading and writing abilities of the professionals who were targeted.

Research Ethics

Ethical considerations important when conducting research are based on the principles of beneficence, respect for human dignity, and justice. This means protections are extended to participants insuring that no harm will come to them while involved in a research study. Respect ensures the right of respondents to have voluntary involvement without penalty, coercion or an obligation to complete the study with full disclosure about what the study involves. Justice for study participants is the protection of their privacy with fair treatment throughout the process (Polit and Beck, 2004).

This study incorporated ethical considerations into the design with an introductory letter that was mailed with the survey. The letter gave notice about the nature of the study, risks and benefits, and the researcher's responsibility to provide for informed consent and then safeguard the privacy of those who participated. More specifically, the letter contained the following information: survey purpose and goals; how subject population was selected; sponsorship of study; the lack of risk or benefit for participants; voluntary participation with no penalty for withdrawal; assurance of confidentiality; and the time commitment involved for completing the survey. Privacy of the respondents was protected by having no identifiers on the returned survey.

Other ethical considerations involve human subjects. The subject population of Montana pediatric providers did not contain vulnerable subjects; children, prisoners, or specific populations of race, religion or ethnicity. There were no risks associated with study questionnaire and while benefits to participants were small, they were offered the opportunity to view research results upon request. The researcher completed the training by National Cancer Institute on Human Participant Protections and this study has been reviewed under exempt designation by the Montana State University Institutional Review Board.

Analysis

Quantitative data from the 85 returned surveys were entered into a secure Montana State University database via Snap software and transported into Statistical Analysis System (SAS) for analysis. Working with a statistician, the student investigator

was able to utilize descriptive statistics to describe and document the results for each research question. Tables utilizing frequencies and percentages were used to further illustrate relationships between the demographics, measurement practices and perceptions of the participants. For each research question, data was integrated with the themes related to Montana's sparse population and rural theory. Spontaneously written responses were pearls of insight, not specifically asked for, but carefully treasured for the additional insight they offered of the participant's experience.

The credibility of the results was evaluated with critical consideration of the rigor of methodologies, and procedural and conceptual limitations encountered while implementing the study. Thus with assessment, methods conformed to ethical design and random sample selection was utilized with a wide sample distribution across the state. There was low investigator bias secondary to conducting a mailed survey. Limitations of this study were related to the novice level investigator; the time and money limitations of a graduate student undertaking a major mailing with postage, paper and copy costs; high non-response rate associated with a mailed survey without follow up and the unknown limitation of how the holiday season affected response rates for busy providers. The survey tool, while scored for content validity, was untested in previous research studies. This could be considered a limitation, although it is interpreted differently by authors Polit and Beck (2004), who state "newly developed instruments can be effectively pre-tested and evaluated with a purposive sample...purposive sampling is often used when researchers want a sample of experts (Polit and Beck, p. 294-295, 2004).

Summary

In summary the methods section presents an outline of the processes used to obtain, organize and analyze data on childhood obesity provider practices. The development and validation of the survey instrument was documented; the sample selection size and randomization was accounted for; and the use of descriptive statistics was described as the method of data analysis. Important consideration was given to the use of ethical research principals when conducting this study and concepts of rural theory were applied to the design. To conclude, this section presents the template of action undertaken as a descriptive, cross sectional design, to study the current practices for monitoring overweight children by Montana primary care providers.

CHAPTER 4

RESULTS ANALYSIS

Introduction

A descriptive and cross-sectional study was conducted to explore current practices for monitoring obesity in children by Montana primary care pediatric providers. The survey asked Montana pediatric providers about their monitoring of overweight children with questions on demographics, use of BMI and other growth measurements, the treatments generated by these measures, perceptions of childhood obesity prevalence and the barriers to reversing current trends. The survey was sent to a random sample of 300 pediatric providers, retrieved from a website of over 900 pediatric providers who care for children enrolled in the CHIP program of Montana. Eighty-five completed surveys were returned for a response rate of 28%.

Data was entered into a secure MSU database where it was transported to an EXCEL spreadsheet and then to SAS software was utilized to create frequency charts for all questions. Descriptive statistics allow the data to be organized and displayed in tables (1-7). By summarizing the frequencies and percentages of the sample for each survey question, the data were organized so patterns emerge and analysis can be completed. Due to the small sample size of the respondent group, no variables were significant predictors of the use of BMI by providers, including practice setting and perceived prevalence of obese children seen in practice.

Results from this study were interpreted using concepts taken from the rural theoretical model. Rural theory was selected because much of the framework is constructed from research conducted in rural communities similar to Montana, a state where 46% of the residents live rurally. The use of rural theory offers a specific lens from which to view the results of childhood obesity monitoring practices. Concepts of distance, access to care, few specialty providers and rural health seeking behavior are presented as influences which may be unique to sparsely populated regions. The U.S. Census data for Montana lists a population of approximately 955,000 residents spread over a land area of over 145000 square miles, creating an average of 6.2 persons per square mile. Fifty-six of Montana's counties are classified as frontier (Montana Department of Commerce, 2007). While rural is defined by population density, open areas and settlements with less than 2500 residents (USDA ERS, 2004), frontier counties are determined by additional components of distance and time to a major market/service area. Therefore, rural themes and concepts will be considered as the results are displayed regarding the monitoring of overweight children by Montana pediatric providers.

When examining results, attention was given to credibility, meaning, importance, and generalizability and future implications of each result as well as to the limitations of the data gathered. The comprehensive analysis of results which follows is organized to correspond with each research question summarized under the broad headings of *demographics, research question 1; measurement practices, research question 2; use of BMI, research question 3; treatment of overweight children, research questions 4;*

provider perceptions of prevalence, barriers and reversing trends of childhood obesity, research question 5.

Demographics: Research Question 1

What are the demographics for the provider; practice setting, type of clinic, number of children seen per day, education/training, years of experience, and gender of the provider? The results for this question are found in Table 1. The survey was mailed to 146 MDs, 82 FNPs, 14 DOs, and 58 PAs. From this total of 300, 85 completed surveys were returned (N=85). The largest group to return the survey was female (64.7%), MD, (48.2%), and providers with five or more year's experience (72%). Most providers cared for children in a family practice (64.5%) or community health clinic setting (CHC) (21.2%). While both of these settings are similar because they provide care for families across the lifespan, CHC are defined by specific criteria. The definition offered by the Montana primary care association defines CHC as not for profit; governed by a board of directors of whom 51% must also be patients of the clinic; services include a full range of primary care, emergency care and preventative services, offered regardless of the ability of the patient to pay (Montana Primary Care Association, 2007). Ten providers (11.7%), practiced at multiple sites; eight (9.4%) providers saw patients in both a family practice and community health clinics; two (2.4%) pediatric providers worked in pediatric specialty and family practice. This reflects a pattern noted on the CHIP provider list website where many providers were listed under multiple sites and one provider may be staffing a clinic in both a city and several, smaller communities.

The large percentage of family practice clinics represented in the survey resulted in greater than 57% of respondents seeing five or fewer children per day. Pediatric specialty clinics were the setting for less than 18% of the respondents with less than 19% of providers seeing between 10-25 children/day.

Rural clinics, from communities of fewer than 2500 residents, were the practice setting for 31.8% of the surveyed respondents, while 28% of practitioners were providing care in the urban cities of Montana. Considering Montana's population, this means almost one third of providers surveyed, practice within one of three Montana cities, Missoula, Great Falls and Billings. The remaining respondents, 38.8%, practice in an urban clusters, an area comprised of a town or small city, with 2500-49,900 people and adjacent communities.

Mid-level providers, FNP, PA and PNP, accounted for over 44% of pediatric providers surveyed, with Advanced practice nurses providing care 28% of the time, compared to PA mid-levels who represented 16.5% of providers surveyed. Providers who practice in Migrant Health and/or Indian Health Services, four of which were randomized from the original sample and mailed a survey, did not respond. This means, while vulnerable populations of Hispanic or American Indian children are seen in communities across the state, data specific to a migrant health or Indian health clinics is not available from the results of this study.

Table 1. Pediatric Provider Demographics (N=85).

Response	Frequency	% of Total Sample
Type of Practice*		
CHC	18	21.2
Family Practice	54	63.5
Migrant/IHS Clinic	0	0
Pediatric Specialty	15	17.6
Other	8	09.4
Practice Setting		
Urban >50,000	24	28.2
Urban Cluster 2500-49000	33	38.8
Rural	27	31.8
Non response	1	01.2
No. of Children Seen per Day		
0-5	49	57.6
5-10	18	21.2
10-15	9	10.6
15-25	7	08.2
25-35	1	01.2
Non-response	1	01.2
Education & Training		
DO	5	05.9
FNP	19	22.3
MD	41	48.2
PA	14	16.5
PNP	5	05.9
Other	5	05.9
Years in Practice		
0-3 years	9	10.6
3-5 years	4	04.7
5-10 years	23	27.1
10-20 years	27	31.8
> 20 years	22	25.9
Gender		
Male	29	34.1
Female	55	64.7
N/A	1	01.2

*More than one response could apply therefore total percent >100.

Measurements of Growth: Research Question 2

What measurements of growth are Montana pediatric primary providers using, who is performing the measures, and how are measurements of growth utilized? The results for this question are found in Table 2. Most providers have RNs (54.7%) and LPNs (37.7%), measure children in their offices, although over 7% of providers were performing their own measures of children in a clinic. Seventy-one percent of respondents' measured head circumference, while more than 95% of providers collected height and weight measurements. Less than 50% reported using BMI as one of the measures of growth for children in their office. This statistic revealed over 40% of practitioners who have available the components of a BMI calculation, height and weight, are not completing the calculation ($BMI = \text{weight} \div \text{height}^2 \times 703$) to determine obesity.

Height, weight and BMI measurements were used by 88% of providers to counsel families and patients. A similar percentage of respondents reported using growth measurements to follow trends and comparisons (62.4%) or to keep measurements on file (67%). An additional 55% of providers reported using measurements of growth to calculate medication dose. Two percent of practitioners reported measuring waist circumference. This is not a recommended measurement of growth for children (National Institute for Children's Healthcare Quality, 2007).

Table 2. Pediatric Provider Measurement Practices (N=85).

Response	Frequency	% of Total
Responsible for Measuring Children		
LPN	32	37.7
MA/CNA	19	22.4
Provider	6	07.1
RN	46	54.1
Other	1	01.2
Measurements of Growth Utilized*		
Height	81	95.3
Weight	83	97.7
Head Circumference	61	71.8
BMI	42	49.4
Waist Circumference	2	02.4
Non-Response	2	02.4
How Height/Weight/BMI Measurements Used in Practice		
Calculate Med Dose	47	55.3
Follow Trends/Comparison	53	62.4
Kept On File	57	67.1
Used to Counsel Family/Patient	75	88.2
Other	4	04.7

*Could check all that apply therefore % totals > 100

BMI Measurement: Research Question 3

*Are providers calculating BMI for children? How is BMI calculated, how often, and where is BMI recorded? The results of this question are listed in Table 3. When asked specifically whether they were calculating BMI for children, 61.2% of providers responded yes, (n=52). This is in contrast to a previous question asking what measurements of growth were being performed for children, where 49% of respondents selected BMI as one of a *choose all that apply* answer.*

Multiple methods are used to calculate BMI and respondents reported with almost equal frequency, using BMI chart (38.4%), BMI wheel (32.7%), and a computer/PDA program (36.5%). A calculator was used by 26.9% providers to calculate BMI, while an online calculator was used least, by 7.6% of providers. BMI measures were reportedly performed for children, yearly and as needed by 38.4% of providers, less commonly at each visit (23.1%), and upon request,(15.4%). Very few providers reported measuring for BMI bi-annually (5.8%).

To be an accurate predictor of overweight or obesity in children, BMI is to be calculated *and plotted on a gender and age specific growth chart* (American Academy of Pediatrics, 2007). Greater than 55 % of respondents (55.8%, $n=29$) who measured BMI for children also recorded BMI on a gender and age specific growth chart. Other places BMI is recorded; the flow sheet (25%), patient notes and dictation (55.8%), a stamped area on the chart (11.5%). BMI was not recorded by one practitioner who measures children's BMI.

Table 3. Providers Using BMI.

Responses	Frequency	% of Total
Do You Calculate BMI on Children (2-18)		
Yes	52	61.2
No	32	37.6
Non-Response	1	01.2
Providers Use of BMI (n=52)		
How BMI Calculated*		
BMI Chart	20	38.4
BMI Wheel	17	32.7
Calculator	14	26.9
Computer/PDA Program	19	36.5
Online Calculator	4	07.6

Table 3. Providers Using BMI (continued).

How Often BMI Monitored			
Yearly		20	38.4
Bi-annually		3	05.8
Each Visit		12	23.1
PRN	20		38.4
Upon Request		8	15.4
Where BMI Recorded*			
Age / Gender Specific Growth Chart	29		55.8
Flow Sheet		13	25.0
Pt Notes/Dictation		29	55.8
Stamped Area		6	11.5
Not Recorded		1	01.9

*Respondents could check all that apply, therefore % if totals >100%

Treatment Practices for Overweight Children: Research Question 4

What BMI percentile or other measurement is associated with

diagnosis/treatment of overweight children, what interventions result from this diagnosis, and is there a treatment protocol in place? The results for this question are listed in

Table 4. While the majority of respondents used above average weight for age (42.4%), to diagnose and initiate treatment for overweight children, equal amounts of respondents used BMI; >85th percentile (27.1%), >95th percentile (27.1%) and >30 BMI (27.1%). The recommended guideline for identifying overweight children is a BMI at or above the 85th percentile on an age/gender specific growth chart and at or above the 95th percentile recognizes obesity in children (American Academy of Pediatrics, 2007). This method is most sensitive to measurement errors, allows for improved accuracy and takes into consideration the changing body fat distribution of a child (National Institute for Children's Healthcare Quality, 2007).

While guidelines for monitoring for overweight in children have been published by American Academy of Pediatrics and the National Institute for Children’s Healthcare Quality, they are not widely used or understood. Not surprising, just over 5% of Montana providers surveyed have a protocol to monitor and guide treatment for overweight children while greater than 51% do not. The majority of respondents say they vary treatment for each child (50.6%). The most popular treatment initiated by providers surveyed was to counsel about exercise (91.8%) and nutrition (91.8%). Moreover, their response suggested more than 89% of providers refer children to a specialist, with 77% referring to a dietician and over 11% referring to other specialist, which raises the question whether providers are educating children and parents about diet and exercise themselves, or involving other team members in the management plan. Less than 3% prescribe medication to treat childhood obesity.

Table 4. Treatment Practices for Overweight Children.

Responses	Frequency	% of Totals
What Measurement Triggers Diagnosis, Counsel, and/or Treatment		
BMI > 85 th Percentile	23	27.1
BMI >95 th percentile	23	27.1
>25 BMI	13	15.3
>30 BMI	23	27.1
Weight above Average for Age	36	42.4
Waist Circumference	4	04.7
Have/Use Treatment Protocol For Overweight Children		
Yes	5	05.9
No	44	51.8
One is Being Developed	1	01.2
Treatment Varies Per Child	43	50.6

Table 4. Treatment Practices for Overweight Children (continued).

What Treatment /Counseling Do you Offer Overweight Children/Parents*		
Exercise and Nutrition Counsel	78	91.8
Medication	2	02.4
Refer to Dietician or Other Specialty	76	89.4
Varied	27	31.8
None	1	01.2

*Respondents could check all that apply therefore % of totals > 100.

Provider Perceptions of Childhood Obesity and Barriers to Treatment: Research Question 5

How do providers perceive the prevalence of obesity in their practices, what age is most concerning and what direction are the trends over the last 3-5 years? What are the barriers to treating overweight children and what opportunities exist to reverse current trends? The results for these questions are listed in Tables 5 & 6. An overwhelming 100% of respondents believe obesity in children is a health concern. Furthermore, 80% of providers who returned the survey are seeing more prevalent trends of overweight children in their practice. The most concerning age group identified by respondents was elementary school age (72.9%), followed closely by preteens (69.4%), and adolescents (64.7%). Surprisingly, only 37.6% were concerned with their preschool age patients.

More than 55% of providers reported prevalence of overweight children in their practice as high as 10-35%, with another 27% reporting 10% or fewer of children in their practice who are overweight. This corresponds fairly closely to national trends of greater than 17% of children in the United States who are at or above the 95th percentile on an

age/gender specific growth chart (Hedley et al, 2004) and the statistics reporting Montana children as overweight or obese, 9-11% (CDC, 2005; Anne Casey Foundation, 2004).

Table 5. Provider Perceptions of Childhood Obesity Prevalence and Trends (N=85).

Response	Frequency	% of Totals
Do You Think of Obesity in Children as a Health Concern?		
Yes	85	100
Prevalence of Overweight Children in Practice		
0-10%	23	27.1
10-20%	29	34.1
20-35%	20	23.5
35-50%	6	07.1
> 50%	0	00.0
Non-Response	7	08.2
Age of Child where Prevalence Most Concerning*		
Pre-school	32	37.6
Elementary	62	72.9
Pre-teen	59	69.4
Adolescent	55	64.7
Trends of Overweight Children Over past 3-5 years		
No Change	9	10.6
More Prevalent	68	80.0
Less Prevalent	0	0
N/A	7	08.2
Non-Response	1	01.2

*More than one response could apply therefore total percent >100.

Perceived barriers to treating overweight children were reported by over 90% of providers as resistance by patient and family. This was followed distantly by 49% identifying time constraints as a barrier to treatment of childhood obesity, lack of

community and school support, (32.9%) and personal knowledge deficit, (31.7%), were also listed.

When questioned how best to reverse trends of overweight children, not surprisingly, over 95% of providers favored more exercise as an important modifiable factor for their patients and diet, decreasing soda availability (80%), as central to decreasing prevalence of overweight in children. Educating parents plays an important role for Montana providers when considering how best to impact the prevalence of childhood obesity, with 88% of respondents choosing more education for parents. Reimbursement for treatment (45.9%) and standardized treatment protocols (35%) were less important to respondents, while government policy supporting changes in childhood obesity management was the least favored by 21.1% of surveyed providers.

Table 6. Barriers to Treating Overweight Children and Reversing Trends (N=85).

Responses	Frequency	% of Total
Barriers to Treating Overweight Children*		
Lack of Community and School Support	28	32.9
Personal Knowledge Deficit	27	31.8
Poor Evidence for Treatment	15	17.6
Poor Reimbursement	25	29.4
Patient/Family Resistance	78	91.8
Time Constraints	42	49.4
Other	14	16.5
How Best to Reverse Trends of Overweight Children*		
Decrease Soda Availability	68	80.0
Educate Parents	75	88.2
Government Policy	18	21.2
Increase Physical Activity	81	95.3
Media Blitz	34	40.0
Reimbursement for Treatment	39	45.9
School Programs	63	74.1
Standardized Treatment Plan	30	35.3

*Respondents could check more than one answer therefore % of total >100.

Handwritten Survey Comments

To accurately analyze the results of this research project, the addition of handwritten comments added to the survey by some respondents is reported. Comments were added by 14.1% of respondents (Table 7). Four of the comments were directed at reimbursement concerns in the treatment of childhood obesity. Six remarks presented additional ideas about the barriers to treating childhood obesity; poverty, low education, poor coping skills, access to care and specialists, parent obesity and mental health of parents/caregivers. Some comments identified issues not addressed by the survey but perhaps considered important enough by the respondent to write in by hand. The final two comments emphasized populations at greater risk for childhood obesity. One respondent expressed increased concern for Native American children and another offered concern for the long term risk to overweight adolescents.

Table 7. Handwritten Comments by Survey Respondents (n=12).

Theme	Handwritten Comment*
Reimbursement Concerns	
	Reimbursement for treatment is huge factor
	Poor reimbursement the biggest barrier
	Society should not have to pay their tax dollars to treat people's obesity
	Maybe reimbursement for treatment
Notable Barriers	
	Low education levels and low family coping skills
	Lack of specialists to make a big impact
	Parents overweight
	Maybe standardized treatment plan
	Poverty, access to care, mental health issues for care providers,
	Public school food choices are terrible in our community
	Money
Vulnerable Populations	
	Adolescent long term risk very high
	Much more prevalent in Native Americans

*Comments transcribed verbatim from surveys.

CHAPTER 5

DISCUSSION

Overview

The problem broadly addressed by this research study involves the increasing prevalence of childhood obesity. Little is known about childhood obesity care and treatment practices of rural providers. This study described Montana pediatric primary providers and their current role for monitoring and managing obesity in children. The purpose of this study was to strengthen knowledge of current rural provider practice in order to better focus research and clinical efforts to reverse current childhood obesity trends.

A descriptive, cross-sectional study of pediatric providers was conducted from a randomly selected group of providers who care for children insured by Montana's CHIP program. A mailed pencil and paper survey was used to collect demographic and current practice information regarding methods used for monitoring a child's growth. Providers were also asked to present their perceptions on the problem of childhood obesity related to the children they see in their practice and barriers they face when treating children. Comments on how to best reverse current trends of overweight children were encouraged. A snapshot of respondent survey results is summarized below:

1. Demographics: Montana provider respondents were fairly evenly represented among rural, urban cluster and urban settings. The majority of respondents offered care in family practice settings; respondents were predominately female,

trained as physicians, and had more than five years experience. Most providers see five or fewer children/day.

2. Measurement Practices: The three most common growth measurements being performed by the majority of providers were height, weight and head circumference. These measurements were used largely to counsel patients and families.
3. Use of BMI: Just 61% of Montana provider respondents (n=52) monitored BMI in children, with just over 55% accurately plotting BMI on age/gender specific growth chart. Equal numbers of providers measure BMI yearly and as needed. A variety of tools were being used to calculate BMI including calculator, computer programs and BMI wheel.
4. Treatment Practices: Treatment for overweight children was largely triggered by “weight above average for age”, rather than the BMI assessment. Treatments used most commonly were diet and exercise counseling. Over half of respondents varied treatment by child and most affirmed the lack of treatment protocols in place for children with obesity.
5. Provider Perceptions: All of the providers surveyed were concerned with the prevalence of overweight children in their practice with the majority perceiving an increased prevalence of more than 10% of their patient population. Elementary children and the preteens were the age groups most concerning to those responding.

6. Barriers and Challenges: Providers identified patient and parent resistance as the most overwhelming barrier to treatment and thought patient /parent education was a factor in reversing trends, as well as lifestyle modification. Handwritten comments offered by 12% of respondents emphasized barriers of poverty, education level, access, and lack of specialists.

The remainder of this discussion will be devoted to a discussion of the results and the clinical and theoretical implications for future studies. Results will be compared and contrasted with the reviewed research literature and limitations of this study are discussed.

Demographics: A Discussion of Provider and Setting

Research question one was directed at understanding the demographics of the practice setting and pediatric provider. The data from this section of the study mirrored the demographic profile of Montana. The survey illustrated provider settings as fairly evenly divided, with most providers who responded practicing in an urban cluster (population 2500 -49999), followed closely by rural providers (population < 2500), and the fewest provider responses from urban setting (>50,000). Consider how 98% of Montana's 56 counties are designated as either rural or frontier and how just one-third of providers practice in rural settings. This suggests large areas of provider scarcity which may necessitate rural residents travel great distances to access care.

The majority of providers surveyed, practice family medicine with few pediatric specialists represented. These findings illustrated the challenge for Montana families who

often must travel to urban centers to visit pediatric specialist and other specialty health services. Provider demographics from this study confirm Montana as a health disparities area where geographic or access differences specific to a population exist in the presence of disease and health outcomes, in this case, children who may require at-risk monitoring or treatment for obesity (Rural Assistance Center, 2007).

Additional data from the survey indicated that the majority of responding providers are seeing five or fewer children per day. The AAP recommendations for child well visits promote six visits the first year, three the second year and 17 visits between ages 2 and 21 (Chung et al., 2006). The results from the current study suggested many Montana children are not being seen as frequently as recommended. This finding is further supported by rural research which has indicated how rural dwellers are less likely to access preventative care (Dennis & Pollotta, 2001), with rural children seen less frequently by providers (Turner & Kaye, 2006). Research conducted in rural southern states found children of rural regions are more likely to be overweight than their urban counterparts (Lewis et al., 2006). This finding lends a greater urgency for understanding how rural providers monitor and manage childhood obesity.

Study respondents indicated they are experienced and academically well prepared. Most were trained as physicians or nurse practitioners, and most had five or more years experience. The majority noted 10 years or more of experience. While not specifically surveyed, the experience of Montana providers suggests longevity in a community exists. Provider longevity was linked positively with health outcomes. Chung et al. (2006) found

well child visit compliance increased with insurance access, continuity of care, long term relationships and clinician skill.

In keeping with rural theory (Lee & Winters, 2006), a provider is a generalist who is experienced, autonomous and offers a wide scope of practice. This reflects the Montana pediatric providers who responded to this study and are characterized as rural, well trained, and a family practitioner with many years of experience.

Implications for clinical practice reside in questions related to the limited number of specialists and the limited number of child visits often seen in rural settings. By definition family practitioners see patients of all ages and levels of acuity. When faced with the complex health issue of childhood obesity, family focused providers may face issues of limited time and limited specialty knowledge. These are barriers identified by providers themselves in previous research for impacting childhood obesity (Dorsey et al., 2005). Having less specific knowledge of the risk factors which may contribute to obesity in children and fewer clinic visits with children, may decrease the opportunities primary care providers have to offer anticipatory guidance (Reilly et al., 2005). The rural concept of generalist suggests limited availability of additional support services (Lee & Winters, 2006; Loue & Quill, 2001). The team approach to treating childhood obesity, where the child is supported by a wide range of services and interventions, has been shown by some researchers to provide the most beneficial treatment (Daniels et al., 2005). This may be inaccessible for states like Montana, where barriers of limited services exist for many communities and thus distance, time and associated economic stress are associated with interventions.

Further implications for clinical practice included findings that suggest many providers in Montana are seeing fewer children than expected by AAP guidelines. Providers may have less time available to form relationships, monitor trends and provide anticipatory guidance for parents and children during problem focused child visits. This makes a case for use of standard guidelines for monitoring weight in children, so early diagnosis and treatment can offset the trajectory of health outcomes associated with childhood obesity.

The demographics of Montana pediatric providers offer implications for future research to clarify frequency of child visits specifically contrasting urban and rural settings and perhaps family practice and pediatric practice settings. Further research should explore whether urban or rural providers perceive more urgent time and resource constraints when dealing with the complexity of childhood obesity. Furthermore, future research is needed to describe the current monitoring and treatment practices specific to Montana's Native American and Hispanic children. Current research suggests these are high risk populations with higher prevalence of childhood obesity but few studies have looked at the mountain west region in relation to this complex disease process.

Implications for rural theory building may be to direct future studies focused on rural child visits to healthcare providers to determine if Montana differs from other urban and rural populations. It is important to understand whether accessibility to providers has a role in preventative care. Rural focused research could provide a better understanding of the time and resources available to busy generalist practitioners and would offer

insight into how best to use technology, networking and satellite services to impact prevalence of overweight children living rurally.

BMI Measuring Practices and Treatment

The second, third and fourth research questions explored growth measurements and the triggers for treatment used by providers in their practice. Findings indicated BMI measurements are being assessed by over half of Montana pediatric providers surveyed. Children's BMI was one-third less frequently assessed than height and weight measurements. Furthermore, respondents indicated height and weight measurements are the most frequently used for the purpose of counseling children on nutrition and exercise. *Weight above average for age* is another common trigger for treatment of overweight children in Montana even though this trigger is not considered the best practice standard (National Institute for Children's Healthcare Quality, 2007).

Best practice guidelines and recent research conducted on childhood obesity updates past practice standards. BMI, a calculation using height and weight measurements [$BMI = Wt \text{ (lbs)} \div Ht^2 \text{ (in)} \times 703$], is acknowledged as the most accurate reflection of child adiposity. To be an accurate, BMI for children (2-18) must be plotted on a gender/age specific growth chart and used in correlation with clinical judgment. This is the current recommendation by AAP, AMA and Maternal and Child Health Bureau (National Institute for Children's Healthcare Quality, 2007).

Survey results from Montana pediatric providers demonstrated that just over 34% are correctly calculating BMI for children. This finding suggests there is a lack of

knowledge regarding the most recent recommendations for children, and some confusion regarding interpretation of BMI data for children. Research on this subject supported the finding that providers are not documenting BMI regularly and express confusion over its use (Barlow et. al, 2007). Furthermore, studies presented figures as low as 11% of surveyed providers using BMI and ranges of 20-53% of overweight children without corresponding diagnosis documented on their charts (Flowers et al., 2007). The importance of accurately identifying overweight and obesity in children lies in research that supports how children who are diagnosed as overweight are more likely to receive earlier and more comprehensive treatment and diagnosis of comorbid conditions (Dilley et al., 2007).

When compared to available national averages, it seems Montana providers are monitoring for BMI at higher rates. However, factoring in the correct use of the BMI by plotting BMI on a gender/age specific growth chart, the percentage is decreased by almost half. Considering the survey data, this demonstrates while over 95% of the children are measured for height and weight and have available the components of BMI, it is not being calculated as frequently. This raises questions whether not completing a BMI measurement may have to do with a) *time*, to calculate and plot BMI: b) *knowledge deficit*, of the recommendations and accuracy of BMI for detecting overweight in children, availability of tools and guidelines; or, c) *confusion*, regarding the differences between a child's BMI which requires plotting on growth charts and adult BMI which does not require this step. Recent research by Flower et al. (2007) suggested how

providers, when questioned in depth, felt ineffective in measuring BMI since they could offer no real solutions for such a complex and overwhelming process.

Implications for future research may be directed at understanding if years of experience or time from initial training, may play a role when considering Montana providers use of BMI. With the majority of surveyed respondents in practice for five or more years, the question should be raised whether guidelines for monitoring and treating childhood obesity are evolving more rapidly than experienced providers can stay current. Thus, further considerations of BMI use, specifically the *why not measure* BMI, offers a direction for future research.

Clinical implications worth considering involve deliberation over survey results to determine which measurements of children trigger treatment. Montana providers are using *above average weight for age*, or *height and weight*, measurements to identify children at risk for or currently obese. In light of research that suggests this provides less accurate determination of childhood obesity (Dilley et al., 2007; Flowers et al., 2007; National Initiative for Children's Healthcare Quality, 2007), clinicians should be encouraged to find quick and easy methods to measure, calculate and plot BMI. Recent increased use of Electronic Medical Records (EMR) may ease this process by utilizing software that automatically takes the inputted height and weight to calculate and plot BMI. It is unknown how widespread use of EMR is with Montana providers, especially the one third who practice in rural communities. Correlating the results of this study with current research may provide insight for future provider education and information

networking that could have an improved impact on reducing prevalence of overweight children.

Few providers who responded have treatment protocols in place for management of childhood obesity. Despite this result, the majority of providers were offering exercise and nutrition counseling to patients who were identified as overweight. This finding was consistent with the most commonly prescribed treatments identified in national research (Dorsey et al., 2005; Golan & Crow, 2004). Some studies further recognized how counseling for diet and exercise did not differ for patients regardless of BMI (Dilley, 2007).

In clinic settings, instructing on diet and exercise involves behavior change. For providers caring for children, this creates a situation where parents and perhaps entire families are encouraged to decrease intake of excess and poor quality calories as well as increase family member and child activity. Many of the statistics on Montana show children living at or below the poverty level (Montana Department of Health and Human Services, 2002). Implications for clinicians may include awareness that many families may be struggling to provide for their children. They may be substituting less expensive, poor quality nutrition for the more expensive fruits, vegetables and quality protein. Data from a study in Kansas supported how rural communities are aware of importance of good nutrition and physical activity, but limited in their ability to change behavior because of accessibility, distance, limited health resources and economic hardships related to weight and eating interventions (Hawley et al., 2006).

Implications for rural theory resulting from this study suggests future research is needed to gather data on how involvement of families, schools and communities impact treatment of overweight children and how this may differ by population setting. Concepts of community, long term relationship with providers, and the health care accessing behaviors of rural dwellers, while implied in this study, need further description to support current theory concepts. Rural research suggests rural families seek health advice from family and friends, before formal health care is sought. Current rural studies seek to demonstrate how individuals living in rural areas often have more intimate relationships and offer support of one another in times of need (Hawley et al., 2006; Loue and Quill, 2001). Further development of rural theory may offer guidance for rural health care prevention and promotion strategies that can combine individual focus with aspects of family and community interaction to successfully impact children's health (Loue & Quill, 2001).

Provider Perceptions of Prevalence and Barriers

Research question five describes the provider's perceptions regarding childhood obesity prevalence and barrier to treatment as well as opportunities for reversing current trends. The perception that childhood obesity is a major health concern for children was undisputed by Montana pediatric providers. The perception that prevalence of overweight children was increasing in providers practices was also overwhelming. The majority of providers surveyed identified 10-20% of children in their practice as overweight, followed closely by 10-20% and 20-30% estimates. Elementary and preteen children

represented the most concerning age group for Montana providers. This percentage of prevalence and the perception of increasing prevalence in school age children mirrors national statistics which place childhood obesity anywhere between 13.9 to 18.8% (CDC, 2007). For Montana, various demographics represent how childhood obesity ranges from 9 to over 17% with elementary children at the highest percentage level (USDHHS, 2003; CDC, 2006).

The perceptions of Montana providers who responded to the survey reflect a global trend where increased prevalence of childhood obesity spans most countries (Wang et al., 2002). Furthermore this perception reflects a growing interest in the barriers and challenges that may keep providers and communities from reversing the obesity trends. Causes of childhood obesity are complex and multifactorial. By narrowing the focus, researchers may identify areas where providers can successfully intervene.

Review of current literature attributes risks for overweight in children to certain factors. These are associated with increased energy intake in the form of high calorie food and drink, less energy output secondary to increased screen time, neighborhood changes which impact outdoor activities and a reduction of school activities (Anderson & Butcher, 2006; Fierro, 2002; Sallis & Glanz, 2006; Zhang et. al, 2006). Moreover, research identifies how children of one or both parents who are overweight, children who are not breast fed, children of certain ethnicities, and children from underserved and rural regions may be at greater risk for obesity (Reilly et al., 2005).

This review of literature corresponds with responses from Montana providers who selected measures necessary to successfully reverse obesity trends in children. These

included decreasing soda availability, educating parents, increasing children's exercise, and improving school programs which support these measures. Reimbursement for treatment of children who are overweight is also a factor, and was cited by four survey respondents in handwritten comments added to the survey.

Barriers to treating overweight in children were identified by most survey respondents as patient and parent resistance. When one considers how treatment of overweight children involves behavior change by both child and family, this response calls for a better understanding of concepts behavior readiness and change to overcome resistance (Golan & Crow, 2004). Other barriers identified by survey respondents included lack of reimbursement, lack of time and lack of knowledge. This is congruent with reviewed studies, where a variety of providers, from various settings describe many of the same obstacles (Dorsey et al., 2005; Flowers et al., 2007).

In rural populations, barriers of distance, poverty, and few specialists have also been identified, although not necessarily linked to children's health. Interestingly, comments added to the survey by several respondents focused on these same barriers associated with rural populations. Handwritten comments mentioned "low education" and "few specialists to make a big impact", other comments regarding barriers were "poverty", access to care" and "money". This finding suggested Montana rural dwellers face many of the disparities identified in other rural regions of the southeast and south west and offer direction for clinicians, theorists and policy makers and future research in Montana and other rural regions.

Implications for clinicians may reside with identifying the challenges, thereby directing future interventions to overcome specific barriers. For example, clinicians may focus lifestyle changes by providing parent-directed behavior modification education to treat overweight children. Furthermore, promotion of standard clinical protocols could potentially streamline and standardized diagnosis and treatment of obesity in children. Education for providers could be directed at diagnostic coding and reimbursement strategies. Clinical practice may further benefit through shared understanding of the obstacles faced in provider settings for managing overweight in children.

Rural theory concepts are strengthened with the information offered by surveyed pediatric providers from this study. The demographic profile designates Montana as predominately rural with three urban cities and adjoining urban clusters in a state consisting of over 145000 square miles. Survey respondents identified themselves as practicing in rural settings in one third of the surveys. The majority of survey providers practice family medicine. Most Montana providers surveyed are seeing 5 or fewer children per day. Providers are overwhelmingly concerned about their pediatric population's prevalence of overweight and face barriers of time, knowledge, patient/parent resistance and reimbursement, in treating children in Montana. Most notable, 12% of respondents submitted written comments highlighting concerns directly linked to rural populations including access to care, lack of specialty care, poverty and low education. Further research could offer focused information regarding the rural child health-illness processes. Largely, this finding has significance for directing future health care focus for Montana's children. The descriptive picture of provider practices offered

by this study, overlaid with data from other rural studies, offers insight into health care for children of rural communities and from that, a direction for reversing the prevalence of childhood obesity.

Finally, additional research could be directed by the comments penned by several respondents. One comment cautioned against the increased risks for American Indians within the state. The second comment raised the issue of mental health and coping skills of child caregivers as a factor in the successful prevention and treatment for overweight children. This recognizes several areas of healthcare where more in depth study is needed.

Limitations and Conclusions

The study of Montana's pediatric provider practices for monitoring overweight in children was limited by time and money available to conduct this research. Further, the study was conducted using a newly developed survey questionnaire, adapted from an earlier tool. Although content validity was established using a team of experts, weaknesses in the tool exist. The pencil and paper, mailed survey was conducted using a limited follow up method (Dillman, 2007), and was sent to a random sample of participants over the Christmas holidays. Without the control offered by electronic surveys, respondents were able to answer questions more than once where not requested and allowed for write in responses where no response was intended. The 28.8% response rate, while an adequate return response for a mailed survey, did result in a smaller sample

size than anticipated. This study was descriptive in nature and not intended for prediction or establishing causality between variables.

This study suggests future direction for clinical practice, research and theory development. Study findings illustrating few specialists, barriers of access to care and poverty coincides with other rural research and offers a direction for focused prevention and treatment strategies to impact trends of overweight in rural children. The study further suggests that providers in Montana, experienced, family practitioners, fit the generalist definition offered by rural theorists. This understanding offers direction for focused provider education, network building and future use of technology to overcome barriers of distance and limited specialty services.

Study findings illustrate child visits are fewer than expected, suggesting many Montana children may not be seen for the AAP recommended well child appointments. This creates a need for further research to clarify whether this is a concern specific to Montana, rural children or all children.

Moreover, while timely and multiple measurements for growth in Montana's children are being conducted, BMI, is not the primary method, nor are those monitoring BMI in children always correctly completing the necessary step of plotting BMI on a gender/age specific growth chart. This suggests a gap in knowledge by Montana providers. Further education and promotion of standard guidelines is needed to impact the trajectory of overweight children in this state. Expert Guidelines and Recommendations compiled on the behalf of the National Institute for Children's Health

Care should be sent to every pediatric provider in the state, as well as to insurers and families with children

Findings on the perceptions of Montana pediatric providers suggest a strong concern for the prevalence of overweight in children and offer insight into barriers they face. These results strengthen findings from studies conducted across various regions and diverse populations. Spontaneous comments by respondents help identify ways Montana's children may face barriers to care that could be linked to other rural communities. This suggests many treatments for childhood obesity utilizing a team approach of many support services may not be accessible in this state. Montana providers might be urged to focus on the strengths of rural communities when considering prevention and treatment of childhood obesity. Future research must continue to explore ways rural theory helps explain children's health care.

For clinicians and Advanced Practice Nurses, this study represents one small piece of a puzzle for understanding the factors that influence the increasing prevalence of obesity in children. It suggests areas of focus for clinicians and areas necessary for further study. The opportunities to impact children's health outcomes in Montana and across the country are vast. Primary providers play an important role as we move forward with our priority of creating a healthy future for our children and the communities where they live.

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APPENDICES

APPENDIX A

CHILDHOOD OBESITY SURVEY

Height Weight Head Circumference BMI
 Other _____ Waist Circumference

9. Do you calculate BMI on children 2-18 years old?(If no skip to question #12)

Yes No

10. If BMI is used, how is it calculated? (check all that apply)

BMI chart Calculator Computer/PDA program
 BMI wheel online calculator N/A

11. How often do you monitor BMI?

Yearly Bi annually Each Visit PRN Upon request

12. Where is BMI measurement recorded?(check all that apply)

Patient notes/dictation Age/Gender specific Growth Chart
 Stamped Area Flow sheet Not recorded
 Other _____

Management Practices

13. How are Height, Weight and/or BMI measurements utilized?(check all that apply)

Kept on file Used to counsel Pt/family Calculate med dose
 Other Follow trends/comparison

14. What Measurement triggers diagnosis, treatment, or counsel?

BMI > 85th percentile/growth chart BMI > 95th percentile/growth chart
 > 25 BMI > 30 BMI Weight above average/age Waist Circumference
 Other _____

15. Do you have/use treatment protocol for overweight children?

Yes No One is being developed
 Treatment varies per child Other

16. What treatment/counseling do you offer to overweight children/parents? (Check all that apply).

- Nutrition counsel Exercise counsel Varied Medication
 Refer to dietician Refer to other specialty None

Provider Perceptions

17. Do you think of obesity in children as a health concern?

- Yes No Undecided

18. What is the prevalence of overweight (> 95th percentile specific for age/gender) children in your practice?

- 0-10% 10-20% 20-35% 35-50% >50%

19. Is there an age group you are most concerned about? (check all that apply)

- Preschool elementary school age preteen adolescent

20. How does the prevalence of overweight children compare over the past 3-5 years?

- No change More prevalent Less Prevalent N/A

21. What do you see as barriers to treating overweight children? (check all that apply)

- Poor Evidence for treatment Pt/family resistance Time constraints
 Poor reimbursement Personal knowledge deficit
 Lack of community/school support Other

22. What do you think would help reverse trends of overweight children?(check all that apply)

- School Programs Decrease soda availability Standardized treatment plan
 Increase physical activities Education for Parents
 Media blitz Reimbursement for treatment Government policy

APPENDIX B

LETTER OF INTRODUCTION

Dear Montana CHIP Provider,

I invite you to participate in a research study, the purpose of which is to understand how Montana pediatric providers are monitoring children for obesity and what they feel are barriers to effective management of overweight children. I am conducting this research for my Master's Thesis with the College of Nursing at MSU.

I am collecting data for this study from randomly selected CHIP providers across the state of Montana. Using the enclosed questionnaire, information will be collected on the assessment practices used to screen children's weight and the barriers that exist for treatment of overweight children. Your participation in this research is completely voluntary and anonymous. If you chose to take part in the study, simply complete the questionnaire and return it in the self addressed envelope by December 31, 2007. The survey consists of 22 multiple choice questions and should take about 5-10 minutes to complete.

The significance of research on practices for identifying overweight children is reflected by the Healthy People 2010 Agenda. This identifies obesity as one of the most significant current health promotion and disease prevention priorities in this country because it is a major contributor to many preventable causes of death. Obesity in children is an equally significant public health concern. And, there is evidence that the incidence of children who are overweight is increasing despite efforts to the contrary. My hope is that the information collected in this study could further the understanding of current practices for monitoring children's weight in Montana, and therefore assist providers in identifying challenges to prevention and treatment. I would be happy to forward my research results upon request.

If you have questions, please contact me at (208) 890-9130 or you may contact my faculty advisor, Sandra Kuntz PhD., APRN, BC, at Montana State University, (406) 994-3500. Thank you for your time and consideration of my research project.

Sincerely,

Nancy Schwarzkopf RN BSN
PO Box 1757
Boise, ID 83701
Montana State University, MSN/FNP student

Survey begins on the back of this page: To begin questions turn over this page. Thank you