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ABSTRACT

CHILDHOOD OBESITY INTERVENTIONS IN THE REPUBLIC
OF TRINIDAD AND TOBAGO: A QUALITATIVE STUDY
EXPLORING GOVERNMENT POLICIES AND THEIR
IMPLEMENTATION BY HEALTH
PRACTITIONERS

by

Phyllis Woolford

Chair: Jay Brand

ABSTRACT OF GRADUATE STUDENT RESEARCH

Dissertation

Andrews University

School of Education

Title: CHILDHOOD OBESITY INTERVENTIONS IN THE REPUBLIC OF TRINIDAD AND TOBAGO: A QUALITATIVE STUDY EXPLORING GOVERNMENT POLICIES AND THEIR IMPLEMENTATION BY HEALTH PRACTITIONERS

Name of researcher: Phyllis Woolford

Name and degree of faculty chair: Jay Brand, Ph.D.

Date completed: December 15, 2022

Because of the rising prevalence of childhood obesity and overweight in the Republic of Trinidad and Tobago, and the observation that efforts to address the problem were showing disappointing results, this study seeks to explore the experiences and views of policymakers, health practitioners, and parents of overweight and obese children, in order to inform leaders and policy makers regarding the current interventions.

Method: A qualitative research case study methodology is the research design used, which, with my research questions, I considered would best uncover knowledge and

provide perspectives that would provide an increased understanding of the issues arising from the current interventions being used to deal with the problem.

Results: Analysis of documents and coding of the interviews data resulted in five themes, which when analyzed, generated the following policy interventions that are currently available for school-aged children, 6-11 years old in Trinidad and Tobago. They are (a) *BMI screening at entrance to primary school age 5-6; and again at age 9-11,* (b) the availability of “Healthy Me” camps, (c) The “Schools Caravans” service, (d) The option to be registered in an obesity prevention program in a “Community Assessment Unit (CAU), and (e) The government driven policy regarding school meals.

Conclusion: This study is a unique perspective in the literature on the experience of the initiatives pursued in the Republic of Trinidad and Tobago to address the problem and highlights the need for increased activity on the part of leaders to effect improvement. Hence, other studies may wish to probe further into determining ways and means leaders may use to construct the financial, clinical and other factors that must be engaged to enhance impact.

Andrews University

School of Education

CHILDHOOD OBESITY INTERVENTIONS IN THE REPUBLIC OF TRINIDAD AND TOBAGO: A QUALITATIVE STUDY EXPLORING GOVERNMENT POLICIES AND THEIR IMPLEMENTATION BY HEALTH PRACTITIONERS

A Dissertation Proposal

Presented in Partial Fulfillment

of the Requirements for the Degree

Doctor of Philosophy

by

Phyllis Woolford

December 2022

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CHAPTER 1

INTRODUCTION

Background to the Problem

When I left Trinidad as a teen to study nursing in England, I imagined returning to the Caribbean to treat the conditions that were prevalent at the time, specifically infectious diseases and under-nutrition. However, upon my return decades later, I noted that a dramatic change had occurred in the health of the population. Chronic illnesses such as diabetes, hypertension and heart disease had replaced infectious diseases as the main public health challenge (PAHO and the Community Secretariat, 2006). Observing how this epidemic affected the country, but more particularly my family, I became interested in using the skills and knowledge I gained in my Master's degree in Health Promotion to aid prevention efforts in the island. As a consequence I began to investigate the problem and concluded that further study of the factors currently considered contributory to the problem and their relationship to existing government public policy initiatives and practice, would likely contribute helpful information and insights to advance obesity prevention in the country. From exploration of the literature, I learned the importance of defining obesity with care, and also observed that obesity is a major public health challenge in many countries of the world.

Definition of Obesity

Dictionary definitions vary, but a good paraphrased summary is that a person is considered obese when body weight increases due to fat accumulating excessively in the body. However, there is some debate regarding the best way to define and measure obesity (Ellis, 1999). The body mass index (BMI) is the most widely used method of screening for obesity (Whitlock, 2005), (Pietrobelli, 1998). The body mass index is calculated using the formula, Weight (in kilograms) / Height (in meters squared). For adults, a BMI between 18.5 and less than 25 is considered a healthy weight. From 25 to less than 30 is considered overweight; and, 30 or above is considered obese according to the Centre for Disease Control and Prevention (CDC 2006).

However, it is not possible to use a set number for children, as the appropriate BMI varies with age and gender. Therefore, in pediatrics, growth charts that present percentiles are used to determine the weight status for an individual child, and a BMI percentile between the 5th percentile to less than the 85th percentile is considered within the healthy range; from the 85th percentile to less than the 95th percentile is considered overweight; and, the 95th percentile and greater is considered obese (CDC 2006).

A Global Problem

Childhood obesity is a rapidly growing concern globally. Johnston and Mack (1978) have shown that obesity in infancy is related to obesity in both adolescence and adulthood. This is of particular concern because obese adults are at increased risk of developing non-communicable diseases (NCDs) such as artero-sclerotic heart diseases, type 2 diabetes, some cancers, cerebro-vascular disease, and hypertension.

This pattern of diseases is observed in the English-speaking Caribbean (PAHO, 2006) where childhood and adolescent overweight and obesity are rapidly approaching the levels observed in more developed countries (Benefice, Caius, & Garnier, 2004). Obesity not only confers a burden of morbidity, it is seen as one of the most important underlying causes of premature death and suffering (Declaration of Port-of-Spain, 2007).

Policies and Interventions

According to Ben-Sefer, Ben-Nathan, Ehrenfeld, (2009), this disturbing worldwide trend of childhood obesity is a cause for deep concern to all health professionals who work with children. This increase in prevalence has led the USA to increase investments in obesity prevention and to focus on interventions that go beyond the individual to address environments and policies (Institute of Medicine, 2010). Efforts to prevent childhood obesity have had disappointing results, and therefore public policy needs to be modified to acknowledge these limitations in treatment outcomes in children who are already obese. Hence, prevention currently remains the best option to address the problem. This therefore introduces the opportunity for governments to be a key player in organizing policies and strategies that support healthy lifestyles among individuals in the community. It would seem therefore that exploring the establishment of preventative health policy would be a key element in guiding implementation of interventions with regard to childhood obesity in the Republic of Trinidad and Tobago. By definition, preventive public policy may be defined as "a system of laws, regulatory measures, courses of action and funding priorities concerning a given topic promulgated by a governmental entity or its representatives" Kilpatrick (2000, p.1). Such policy then will be expected to cover the issue of childhood obesity from a holistic perspective i.e.

physical, social, psychological, cultural and environmental. Preventive public policy as defined here therefore, will then be considered as the driver to intervention development and implementation from all these perspectives. This will be the focus of this part of the study. Figure 1, as developed by Kumanyika, Jeffery, Morabia, Ritenbaugh, and Antipatis (2002) shows the societal policies and processes influencing the population prevalence of obesity factors which have a major influence oIntervieween an individual's life and which are sometimes seen as determinants or drivers of health.

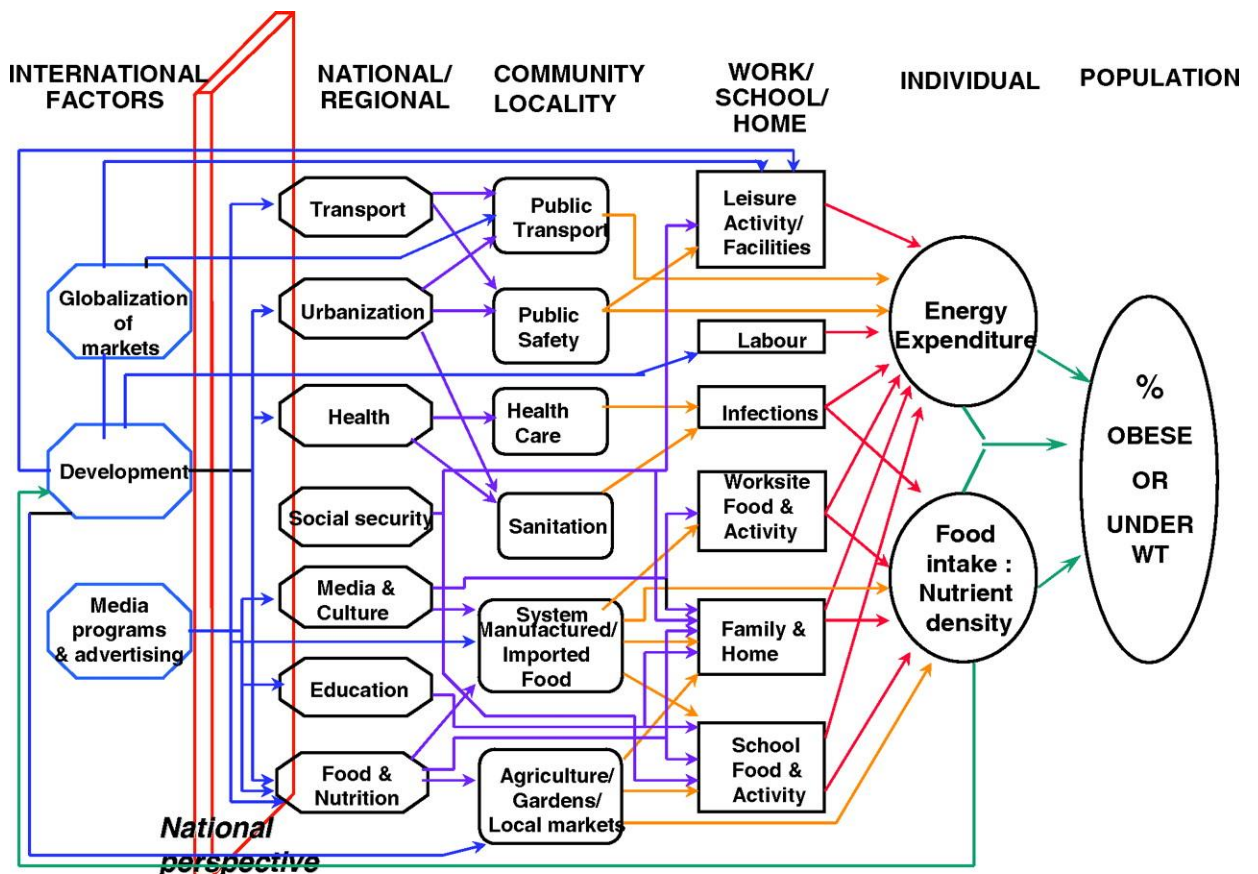


Figure1. Societal policies and processes influencing the population prevalence of obesity. (Kumanyika et al. 2002)

Obesity and overweight have been seen as major global health problems (World Health Organization, 2007). As a result policy makers everywhere are being compelled to develop more effective policy interventions to address the issue.

Statement of the Problem

In the past forty years the Caribbean countries have seen a significant decrease in childhood mortality and morbidity due to childhood malnutrition and infectious diseases. However, with the development of these economies there has been a steady increase in the incidence of obesity, a major underlying risk factor for NCDs. The Republic of Trinidad and Tobago has not escaped the obesity epidemic, and, as seen in a study reported in the International Journal of Epidemiology (2001), the proportion of overweight or obese children in the Republic of Trinidad and Tobago was similar to that observed in England and Scotland, and, was higher in Afro-Trinidadian than in Indo-Trinidadian children (Gulliford, Mahabir, Rocke, Chinn, & Rona, 2001). Further, the CARICOM heads of government present at the Port-of-Spain Declaration meeting in 2007, when addressing health in the region, regarded NCDs as the major health challenge due to their impact on avoidable health costs and lost productivity. However, obesity, the major risk factor for NCDs, is complex, and it is difficult to isolate and manage exposure to a single obesity promoting factor. Thus, many health professionals and related constituencies agree that a need exists to move beyond biology and individual behaviors to investigate whether other measures, e.g., economic, political and cultural considerations, could be significant in bringing about a reversal of the epidemic, rather than focusing solely on individual physiology and personal characteristics.

Due to an awareness of the potential problems posed by this condition, obesity is currently high on the health and political agenda of the Republic of Trinidad and Tobago. The hope therefore, is that the findings from this research might provide formative data to aid in the process of addressing childhood obesity in the Republic of Trinidad and Tobago.

Purpose Statement

The purpose of this study is to obtain and explore the views of policy makers, health practitioners (doctors, health visitors, school nurses, dieticians) and parents of overweight or obese children, with respect to efforts currently being made to treat the rising prevalence of childhood obesity among 6-12 year-old children living in two of the Regional Health Authorities in the Republic of Trinidad and Tobago, i.e., one rural and one urban.

Research Question

The following question(s) will guide this research:

1. What obesity prevention and treatment policy interventions are currently available for school aged children 6-12 years old in the Republic of Trinidad and Tobago?

2. What are the perceptions and challenges experienced by implementers of interventions, and, by parents of overweight or obese children?

3. How do policy makers and health practitioners perceive their current impact on childhood obesity trends in the Republic of Trinidad and Tobago?

Rationale for the Study

Due to the rising incidence of Childhood and Adolescent Obesity in the Republic of Trinidad and Tobago and the country's view of this as a major public health challenge, especially considering its impact on ensuing morbidity and mortality, I consider it necessary and important to conduct this study in order to derive relevant data/ knowledge residing in the experience of practitioners in the field, so that these data can be used to contribute to the effective resource allocation currently focused on treating the problem.

Conceptual Framework

The main entities to be thoroughly documented and studied are the policies and initiatives of the government that, in their view, relate to achieving reduction of the prevalence of childhood obesity; and, the current practices employed in the country's health centers and schools to address the problem. In doing so, I plan to use Beattie's health promotion model as shown in Figure 2 to analyze the current interventions and policies, and to estimate connections between the existing health interventions and the prevalence of childhood obesity. What I am planning to do therefore is a qualitative study using the methodological strategies involved in case study.

The way by which the analysis will be pursued will be by determining the bases of knowledge and power evident in the policies and interventions, as they relate to modes of intervention that target the individual and/or the community (Beattie's horizontal spectrum, and, also with regard to modes that are authoritative or negotiated (Beattie's vertical spectrum).

Figure 2. Use of this model based on Beattie (1991) to analyze practice.

Mode of intervention: Authoritative
Mode of thought: Objective knowledge

Health persuasion	Legislative action
• To persuade or encourage people to adopt healthier lifestyles • Practitioner is in the role of expert or 'prescriber' • Conservative political ideology • Activities include advice and information	• To protect the population by making healthier choices more available • Practitioner is in the role of 'custodian' knowing what will improve the nation's health • Reformist political ideology • Policy work, lobbying, etc.
Individual Personal counseling • To empower individuals to have the skills and confidence to take more control over their health • Practitioner is in the role of 'counselor' working with people's self-defined needs • Liberation or humanist political ideology • Activities include counseling and education	Collective Community development • To enfranchise or emancipate groups and communities so they recognize what they have in common and how social factors influence their lives • Practitioner is in the role of 'advocate' • Radical political ideology • Activities include community development and action

Mode of intervention: Negotiated
Mode of thought: Participatory, subjective knowledge

Definitions

There are several terms encountered frequently in the study of overweight and obesity that it would be well to define at the outset, as in some cases differences in definition may be encountered in the literature. The definitions chosen for this study are those suggested by the World Health Organization (WHO).

1. *Prevalence*: the total number of individuals in a population who have the health condition at a specific period of time, and this number is usually expressed as a percentage of the population.

2. *Body Mass Index* (BMI): a person's weight in kilograms divided by the square of his height in meters (kg/m2).

3. *Overweight*: a BMI greater than or equal to 25 (the WHO definition for adults.)

4. *Obese*: a BMI greater than or equal to 30 (the WHO definition for adults.)

Significance/Importance of the Study

The significance and importance of this study can be expressed in terms of the benefits that would be derived from doing the study. I consider them to be:

1. The provision of a research-based foundation for making changes or adjustments to policies to enhance the country's efforts to deal with the problem.

2. The contribution to theory, through the development of a theoretical framework, based on the literature, for estimating the relationship between the relevant health policies and the prevalence of childhood obesity.

3. The consequent potential reduction of subsequent disease risk and perceived societal burden.

Delimitations

Delimitation refers to actions on my part to achieve a narrowing down of the problem of the study. In order to keep this study manageable I have limited the policies and initiatives to those that are currently being promoted by the Health Ministry, and, I have limited the research participants to a purposive sample of government Ministry of

Health officials, key personnel currently serving in two of the Regional Health Authorities of the Republic of Trinidad and Tobago, health promotion personnel, regional health center personnel, school nurses and parents of overweight or obese children.

Limitations

Limitations refer to facts and conditions which are outside of my control in this study and which could potentially weaken the study if they are not acknowledged and/or catered for. In this study they are (a) possible unavailability of participants having the time to be interviewed, (b) the gaining of access to the policy documents, and (c) participants inability to reflect on practice due to time constraints.

Organization of the Research Study

In Chapter 1 there is provided the background of the problem and a summarization of it in a problem statement. The chapter ends with the organization and design components of the study. Chapter 2 is comprised of a review of relevant literature and research with which the obesity problem that is being addressed in this study is associated. In chapter 3 is given an outline of the methodology and procedures that will be used for the accomplishment of data collection and analysis, and in chapter 4 there will be the documentation of the analysis of the collected data, and, the presentation of the results of the analysis. Finally, chapter 5 will comprise of a summary of the findings together with discussion and indications of their implications for the problem and any recommendations for future research.

CHAPTER 2

LITERATURE REVIEW

I will initially review the global prevalence of Childhood Obesity, and also the prevalence in the wider Caribbean region. Specific attention will be given to studies which present data on current interventions, treatment and policies, employed in efforts to reverse increasing prevalence and the ensuing rise of co–morbidities in children and adults. The review of the literature will then be broadly focused on childhood obesity in Trinidad & Tobago (T&T), and the relevant health policies and initiatives of the Ministry of Health, which are promoted and conducted in the Regional Health Authorities of the country.

The methodology used for this literature review is a database search of current literature. The databases that were searched were Pub Med, Medline, CINAHl, EBSCOhost which are all specific to health related literature. Key words used in the search included obesity, prevalence, childhood obesity, BMI, adolescents, health policy, interventions and Trinidad & Tobago. The literature search was confined to the last ten years with an emphasis on the last 5 years, (except in cases of definitions and guidelines where these were issued prior to the 10 year time frame for this review). I selected about 50 relevant articles from a variety of countries and I am using about 30 articles to form the basis of this review.

Definition of Terminology

Obesity

The American Heritage Dictionary (1985) formally defines obesity as a "condition of increased body weight that is caused by an excessive accumulation of fat." However, direct ways of measuring adiposity (fat cells) such as hydrostatic weighing and skinfold measurements with calipers, are not convenient to perform in primary care settings, therefore there is some debate regarding the best way to define and measure obesity (Ellis. 1999), and definition has varied from time to time but, body mass index BMI is the most widely used method of screening for obesity (Whitlock, 2005) and (Pietrobelli, 1998). For adults, a BMI between 18.5 and less than 25 is considered a healthy weight. From 25 to less than 30 is considered overweight; and 30 or above is considered obese.

There are limitations however in using BMI even though it has many advantages. This is because it has been found that the relationship between BMI and body fat varies with age, with the muscularity of individuals, and, with ethnicity (Prentice, & Jebb, 2001).

National or international reference data may also be used to define overweight and obesity in children. For example, in the UK, BMI reference percentile curves have been derived from height and weight data which were collected in 1990 from a nationally representative sample of children, aged from birth to 23 years of age (Cole, Freeman, & Preece, 1990). These reference data are being used in many countries, for example in Sweden, France, China, and Trinidad and Tobago. Indeed, many countries which do not have their own national reference curves rely on the UK or USA reference data. The problems arising from this practice have caused the International Obesity Task Force

(IOTF) to adopt an international definition based on data collected from 6 different countries. From this pool of data, quasi-percentile curves were developed that linked to adult cut-offs of 25 and 30kg/m for overweight and obesity (Cole, Belliri, Flegal, & Dietz, 2000).

As my study will be looking at prevalence of obesity in pre-teen, it is important to note another method that is commonly used in this age group, i.e., waist circumference, and skin-fold thickness analysis. This is an indirect measure of body fat that is not based on weight. Waist circumference, when measured between the rib cage and iliac crest is an indirect measure of central obesity and so has an advantage over BMI in that it gives an indication of the distribution of body fat. Central obesity is well known to be a risk factor for cardiovascular disease in adults (von Eifben, Mouretson, Holm, Montvillas, Dimceviki, & Sucui et al., 2003).

Percentile curves for waist circumference were developed in 2001 from data obtained from a 1988 sample of British children age 5-17 (Mc Carthy, Jarrett, Crawley, 2001). The problem with using this measurement is that appropriate cut-offs to define overweight and obesity have not been agreed; also, the relative proportions of intra-abdominal and subcutaneous fat is known to vary with ethnicity. Morbidity implications of waist measurements will be different for different ethnic groups.

Skin-fold thickness measurements involve measuring layers of subcutaneous fat at different sites in the body, e.g., triceps, biceps, sub-scapular and supra-iliac skin-folds. The method of using triceps skin-fold thickness measures in adolescents, and, using the sum of skin-fold measures at four different sites in children, have been found to be a better screening tool for obesity than BMI, in predicting body fat in adulthood (Nooyens,

Koppes, Visscher, Twesk, Kemper, & Schuit, et al., 2007). As skin-fold thickness has been shown to vary by sex and ethnicity it may be a useful addition to BMI in assessing disease risk in different ethnic group (Sisson, Katzmarzifkl, Srinivasan, Chen, Freedman, & Boucharlet, et al., 2009).

Overweight Versus Obese in Children

It is important to note when reviewing the literature, that the terminology for addressing childhood obesity has varied overtime. Initially, those between the 85th and 95th percentile were defined as at risk for overweight and those at the 95th and greater were defined as overweight. These terms were used due to a desire to avoid the stigma of using the term obesity with children. However, research suggested that this may not have adequately conveyed the significance of the child's weight status to parents (Woolford, Lumeng, Clark, Williams, & Davis, 2007) and therefore, recently the Center for Disease Control and Prevention determined that it would be best to use the same terms used for the adult population, and changed to overweight for the 85th to 95th percentile, and obese for those at the 95th or greater (Center for Disease Control and Prevention, 2006).

For children therefore it is not possible to use a set number as the appropriate BMI varies with age and gender. Thus, in pediatrics, growth charts which present percentiles, are used to determine the weight status, a BMI percentile between the 5th percentile to less than the 85th percentile is considered within the healthy range; from the 85th percentile to less than the 95th percentile is considered overweight; and the 95th percentile and greater is considered obese (Center for Disease Control and Prevention, 2006).

Global Prevalence of Childhood Obesity

Childhood obesity and adolescent obesity are increasingly becoming a major public health issue in countries all over the world as cited in the Forum on Child and Family Statistics (2005). This disorder is well documented and it is now the most common metabolic and nutritional disease, whereas thirty years ago, obesity was rarely seen in children. In the past twenty years however, there has been an exponential increase in the incidence of obesity among children. According to Tremblay, & Willms, (2003), there was a 17% increase in obesity rates among boys, and a 15 % increase among girls since 1981 to 1996. This alarming increase in childhood obesity has been observed in all the westernized countries, e.g., United States of America, Canada, England, Scotland, Spain, to name a few.

The current attention to this problem is therefore due to the dramatic increase in obesity over the past 4 decades, a problem which, though first started in countries like the United States, has now also begun to affect other developed and many developing countries. This rapid increase in the prevalence of childhood overweight and obesity has reached epidemic proportions in the United States, Canada, Australia, countries in Europe, the Caribbean and most industrialized countries as the literature on childhood obesity suggests (Savoye, 2007).

Looking specifically at the US, which has the most extensive data on the problem of childhood obesity, Ogden, Carroll, Curtin, McDowell, Tabak, and Flegal (2006) have documented the changes seen in the prevalence of obesity using National Health and Nutrition Examination and Surveillance (NHANES) data starting in the 1960s (Ogden, 2001 et al.). From these studies it is seen that only 5% of children were obese in the late

1960s and early 1970s. However, by the turn of the century 17% of children were defined as obese.

Ebbelung, Pawlak, & Ludwig, (2002) estimated a global figure of 18,000,000 overweight children. According to Lobstein & Frelut (2003) (as cited in Ben-Sefer, Ben-Natan, and Ehrenfeld, 2009, p.167) "approximately 10-30% of European children between the ages of 7-11 years, and 25% of adolescents are overweight or obese." According to Lissau et al., (2004), this represents a worrying upward trend in countries that have traditionally had low rates of overweight incidence. Table 1 indicates the prevalence of overweight and obesity in children between the ages of 6-13 years for a range of countries.

Data for Europe as a whole generally indicate that children from Mediterranean countries have a higher prevalence for being overweight than children in northern European countries, with rates ranging between 10-20%. Eastern European countries have not escaped the effects of this epidemic; for example, rates of obesity in Poland increased from 8% to 18% between 1994 and 2000 (WHO, 2005). The Middle East is also showing an increase in the prevalence of excess weight among children, with 18% noted to be overweight, and 7% obese (Lobstein & Frelut, 2003; Keinan-Boker et al., 2005).Table 1.

Table 1

Percentage of Overweight/Obese Children

Nation	**Age (years)**	**Percentage of overweight/ obese children**
Hungary	11-14	6.0
Poland	11-14	18.0
Australia	6-13	30.0
New Zealand	6-13	30.0
USA	6-13	25.5
Israel	6-13	13.9
Ireland	6-13	24.7
France	6-13	11. 4
Greece	6-13	28.7

Note: From (Lobstein & Frelut 2003; McCarthy, M. 2004; WHO, 2005)

In Australia, New Zealand, and the Pacific Islands rates of obesity/overweight children are high overall and vary greatly by ethnic group. As indicated in the chart above, Australia and New Zealand ranks high in percentage of overweight/obese children, i.e., amongst the highest in the developed world (Barnett, 2006). The prevalence of obesity among Maori and Pacific Islander children is particularly high, with approximately 31% affected (Baur, 2006).

Africa has for many decades struggled with the problems of famine and under nutrition. While these situations continue to be a problem, many African countries are also facing the spectra of an obesity epidemic. Particularly in urban centers where poverty exists and many families have moved from consumption of traditional diets to

more western style foods, the prevalence of obesity is increasing. For example, the World Health Organization (World Health Organization, 2005) reported that 14.9% of children under the age of five in Swaziland are overweight despite the paradox of food shortage and obesity. A similar pattern has emerged in the most populous countries in the world, i.e., China and India.

In the Americas obesity has been a long standing problem. As noted above, the U.S.A. saw a dramatic increase in the prevalence of obesity from the 1970s to the turn of the century. During this time the prevalence of obesity among children and adolescents aged 6-19 years tripled as reflected in the results of the National Health and Nutrition Examination survey (NHANES). Mexico is poised to overtake the USA in obesity rate in the near future; obesity is 1.5 times more common in Mexican American women compared to their U.S Caucasian counterparts (Martorell, Kettel, Khan, Hughes, & Grummer-Strawn, (1998).

Meanwhile, in the Caribbean much attention is rightly being focused on the increasing prevalence of obesity in the region, because this rising obesity epidemic is one of the major underlying causes of non-communicable diseases (NCD), which are responsible for most deaths in the English-speaking Caribbean today. Data collected from the region concerning pre-school children being overweight indicate a higher prevalence than the global rates of 3.3% (World Health Organization, 2010). In the Republic of Trinidad and Tobago, 25% of school-aged children (5-18 years) are overweight or obese. There has already been the emergence of CNCDs like diabetes in our children and youth population (Ministry of Health, 2012).

Disparities in Prevalence

In many of the countries reporting data regarding the prevalence of childhood obesity, statistically significant differences exist by race/ethnicity and income. In developed countries, minority children and those from low income families are often disproportionately affected by obesity. For example, in the US African American youth (particularly African American Adolescent girls) have a significantly higher prevalence of obesity than other subgroups of the population; i.e., 14% of Caucasian adolescent girls are obese versus 26% of African American adolescent girls (Ogden et al., 2010). In a study carried out at the University of the West Indies using similar scientific measurements as those used in the U.S, overall, Tobagonian females were heavier and had prevalence of childhood obesity (Selby et al., 2008). The differences in prevalence of obesity in the island of Trinidad and the Caribbean may be due in part to the consumption of high fat and high sugar foods which may be greater in some sub-populations as displayed in Figure 3 below.

Mechanism of Obesity

According to Whitney & Rolfes, (2002) during growth fat cells increase in numbers when intake exceeds expenditure and they also increase in size, when they reach their maximum size and the energy intake continues to exceed output the cells will increase in numbers again. However, if there is fat loss only the size of the cell shrinks, but not the numbers so if one puts the weight on again there are many more fat cells around.

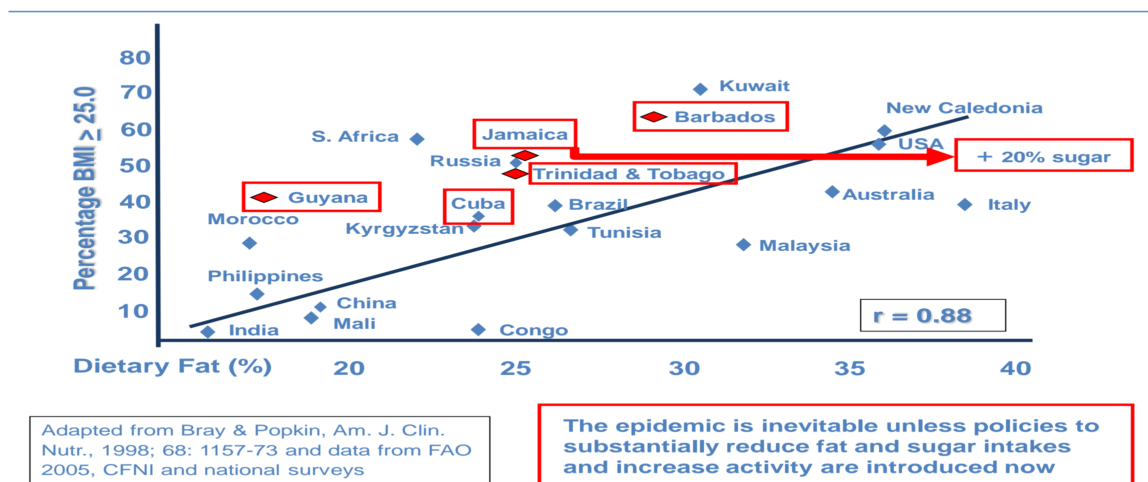


Figure 3. Dietary fat and overweight: Caribbean comparisons + sugar effect.

Etiology of Childhood Obesity

Childhood obesity is a multifaceted problem with many factors affecting the onset of excess weight, many of which are not fully understood. It is believed that genetic causes of obesity are rare and only about 1% of obesity is due to hormonal causes (Nieman, 2004). Therefore, we are left with the basic problem of an imbalance between calories in through nutrition and calories out via activity. It is now a matter of observation that over the past decade or two, the food portions, the children and their problems are all increasing to super-sizes, which supports the presence of a higher than appropriate caloric intake. On the other side of the equation, we find that physical activity among children is lower than it should be. For example, in the US, only 11% of children get the recommended 60 minutes per day of moderate to vigorous physical activity (Center for Disease Control, 2006). Though nutrition and physical activity are the basis for

developing excess weight, there are a myriad of factors that impact a child's diet and activity patterns. To conceptualize this, the Socio-ecological Model is often used as a framework. This suggests that obesity is affected by factors at different levels including the Societal, Community, Organizational, Interpersonal and Individual levels (Stokols, 2000). Therefore, all of these levels need to be considered when attempting to develop interventions to reduce childhood obesity.

Trajectory of Childhood Obesity

Obesity in infancy has been related to obesity in both adolescence Johnson & Mack, (1978) and adulthood Charney et al., (1976), and childhood obesity has been related to adult obesity. Abraham & Nordsieck (1960) showed that the risk of an obese 10-13 year old becoming an obese adult was 18:1 for females and 6: 1 for males. Garn & Clark (1976) showed that the degree of obesity of children having two heavy parents is three times the degree of obesity of children having two lean parents. These relationships are seen in both natural and adopted children. It has been shown that children that are obese at the age of four have a twenty percent possibility of developing adult obesity. Using data from Abraham (1960) and colleagues, 80% of obese women and 55% of obese men were heavy as adolescents, this clearly underscores that obese children are children at risk for being obese adults with all the attendant health problems.

Obesity Shaped by Global Drivers and Local Environments

In the 1970s and 1980s the rise in the obesity problem globally first seemed to happen in most high-income countries. Subsequently, most middle–income and many low-income countries joined in the upward surge in prevalence in adults and children (World Health Organization, 2005). The pattern of this global rise appeared to have

started with groups of high socioeconomic status who tended to have high obesity prevalence. As a country's gross domestic product (GDP) increases the burden of obesity shifted across all groups. This global rise is accounting for 2%-6% of total healthcare in most countries.

A degree of economic prosperity may be seen as an enabler for obesity. The relation between GDP and mean BMI is linear at low levels of GDP, e.g., $3000 and less, but this does not have to be so for obesity is also seen in some low income countries. Figure 4 below illustrates this point.

Source: Economic growth and obesity: An interesting relationship with world-wide implications, by Egger, G., Swinburn, B. and Amirul Islam, F.M. (2012) (p. 149)

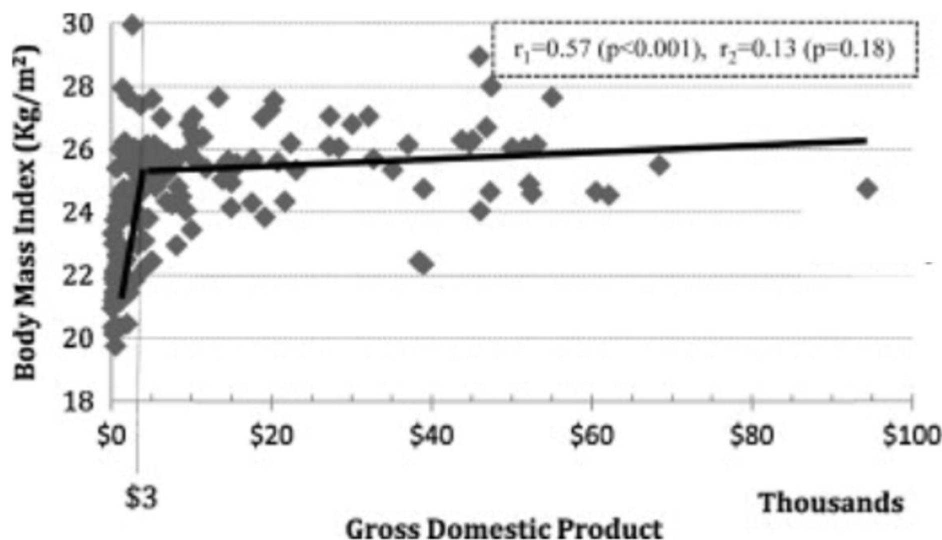


Fig 4. Per capita Gross Domestic Product (GDP) by mean BMI (males and females combined) for 175 countries. *Note*: The extreme outlier in the top left hand corner is Samoa and was not included in the analyses. The vertical line at GDP of ~$3000 represents the GDP at which spline analysis best separates a positive relationship at lower GDPs and no relationship at higher GDPs.

The economic transition also brings with it several other transitions. Popkin (as cited in Swinburn, Sacks, Hall, McPherson, Finegood, Moodie, & Gortmaker, 2011) describes the transitions as:

> Demographic (younger to older population description, rural to urban); epidemiological or health (infectious diseases to NCDs); technological (low to high mechanization and motorization); and nutritional (traditional foods and cuisines to more processed energy-dense foods). (p. 806)

These transitions are sometimes seen occurring together with the burden of under–nutrition and over–nutrition at the same time, and such countries are therefore having to deal with all of these issues and all the ensuing conditions. The global food system is also another driver of obesity, as it facilitates the increased supply of cheap foods, much of which are processed and energy-dense According to Hawkes, Chopra and Friel (2009) “Globalization is also influencing diets by radically altering the nature of the food system”. (p. 241) They then went on to identify three important changes in the food system that have influenced diets, and these are shown under the “Globalization process” in Table 2 that shows Globalization Processes Linked with the Nutrition Transition.

These processes, clearly driven by global food corporations (GFCs), create a food environment in which traditional staple diets that were usually “nutrient-dense” are being abandoned and diets that are “calorie-dense” are being embraced, with the result of this nutrition transition being that “people are consuming more fats, sweeteners, energy-dense foods, and highly processed foods compared to traditional diets characterized by higher intake of cereals.” Hawkes et al. (2009) p. 238), all of which leads to obesity and diet-related chronic diseases.

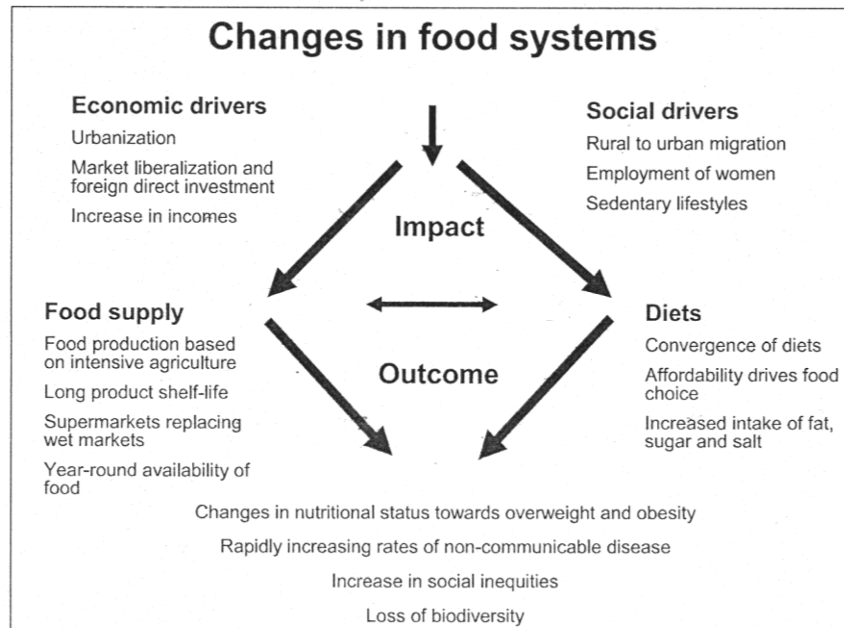
Table 2. Globalization Processes Linked with the Nutrition Transition

Globalization Process	Dietary Implication
Growth of Transnational Food Corporations (TFCs), including supermarkets	Increases availability of processed foods (fast foods, snacks, soft drinks) through growth of fast-food out- lets, supermarkets, and food advertising/promotion; driven by trade and foreign direct investment (FDI). Growth of transnational supermarkets changes food availability (increases diversity of available products), accessibility, price, and way food is marketed
Liberalization of international food trade and national food trade and foreign direct investment (FDI)	Imports change availability of foods and/or their price; investment changes type of foods available, their **price,** and the way they are sold and marketed.
Global food advertising and promotion	Shapes food preferences by affecting desirability of different foods

Source: Hawkes et al. (2009, p.241) Globalization, Trade, and the Nutrition Transition

Kennedy, Nantel and Shetty (2004) commenting on the phenomenon of globalization indicates that it is “having a major impact on food systems around the world,” (p. 1) and that food systems are changing rapidly, and that “many of the changes are closely associated with urbanization, increasing incomes, market liberalization and foreign direct investment.” (p. 1). To assist in developing this view, they have developed and used a conceptual framework to bring into focus the major driving forces that are behind the changes that are observed in the food systems., The framework is shown below in Figure 5, and it serves to make clear how the economic and social drivers impact on the food supply and on diets to produce among others, the outcomes of (a) changes in nutritional status towards overweight and obesity, and (b) rapidly increasing rates of non-communicable disease;

Figure 5: Conceptual Framework of Changes in Food Systems



Source: FAO Paper 83. (2004) Page 2. Kennedy, G., Nantel, G. & Shetty, P. Globalization of food systems in developing countries: a synthesis of country case studies.

Main Causes of Childhood Obesity

According to Nieman (2004) a practicing pediatrician identified three main causes of child hood obesity:

1. Genetics which can contribute to obesity but is rarely seen;

2. Overeating. Many children live lives that are influenced by an increase in overeating; e.g., supersized portions are increasing. Many are eating less vegetables and fruits and eating more fast foods. A study carried out by King, Boyce, & King, (1999) showed the percentage of fruit and raw vegetables grade school children eat regularly in the period 1990 to 1998. For any given meal, at least 30% of children are eating fast

foods and are therefore eating approximately 200 more calories than necessary, which adds up to six pounds of fat per year.

3. Lack of exercise. Children need to be taught to understand the concept of energy in and energy out (Kuntzman, 2004). Not getting enough exercise is negatively associated with obesity. This tends to be replaced with watching television which has been proven to be a significant factor in childhood obesity.

In addition to the three points made above, there needs to be added the role played in obesity prevalence by marketing, availability and accessibility of calorie-dense foods and drinks. Swinburn Caterson, Seidell and James, (2004), make the point that “The increasing westernization, urbanization and mechanization occurring in most countries around the world is associated with changes in the diet towards one of high fat, high energy-dense foods and a sedentary lifestyle. This shift is also associated with the current rapid changes in childhood and adult obesity.” (p. 124). Additionally, people’s “failure to adhere to healthy diets has been explained in terms of physical access to supermarkets and grocery stores, marketing and distribution of healthy foods, urban sprawl, and the time spent commuting to work.” (Drewnowski and Darmon, 2005, p.270)

Health Sequelae of Childhood Obesity

The increase in childhood obesity prevalence is important due to its numerous health and financial consequences. Children who are obese are more likely than their normal weight peers to suffer from many medical problems including type 2 diabetes (Must & Strauss, 1999), and (Neiman, 2004) makes the point that obese children might have many social and physiological problems. Many children who are obese are often

teased and ostracized because of their weight this can even start as early as kindergarten, cited by (Partridge, 2003). In a recent study of obese boys, it was shown that they are four times as likely to suffer from depression when compared to their thinner peers. These factors appear to take a toll as illustrated in Partridge's (2003) study from The Journal of the American Medical Association which showed that obese children consider their quality of life significantly impaired and that the degree of impairment was similar in degree to the effect on quality of life reported by children being treated for cancer (Partridge, 2003).

Obesity is also associated with long-term complications of dyslipidemia, hypertension, coronary heart disease and insulin resistance diabetes according to Barlow and Dietz (1980). If this epidemic of childhood and adolescent obesity continues, the next generation who will enter adulthood will already have a host of health problems because of their history of childhood obesity (Canadian Press, 2003), putting them at risk for greater morbidity and premature mortality. This is likely due to the fact that the number of years that one is obese, the greater the likelihood of developing obesity-related illnesses. Thus, those who are obese as children are more likely to develop comorbidities as adults (Dietz, 1998). In addition, they are more likely to suffer from complications of those illnesses at a young age. For example, it is likely that obese children, who develop type 2 diabetes at a young age, will also develop renal complications at a younger age than has been noted in the past. It is the case also that such obese children may also develop metabolic syndrome as, according to Lennie (2006), "the 2 factors most strongly linked to the metabolic syndrome are abdominal obesity and insulin resistance." (e528). Further, Weiss et al. (2004) indicate that their research findings suggested that "the

metabolic syndrome is far more common among children and adolescents than previously reported and that its prevalence increases directly with the degree of obesity. Moreover, each element of the syndrome worsens with increasing obesity". (p. 2371). The conclusion was that the consequences of an increased risk of adverse cardiovascular outcomes were already present in those youngsters.

Obesity Related Costs

These health-related sequelae of childhood obesity lead to a substantial economic burden of obesity. In 2007 it was estimated by Finklestein et al., that $147 billion was spent in the US on obesity-related medical expenditures. Because most of these costs are related to adult illnesses, the economic burden of obesity has to be studied almost exclusively in adults. However, recent studies suggest that some of these costs begin to accrue during the childhood years.

Wang and Dietz (2002), in their study focused mainly on classic outcomes of obesity e.g. diabetes, sleep apnea and gallbladder disease and showed that the presence of these obesity-related illnesses increased healthcare costs for children in recent decades. Woolford, Gebremariam, Clark, and Davis (2007) examined the length-of-stay (LOS) and specific charge data for pediatric discharges where obesity was listed as a secondary diagnosis in those who were admitted for common pediatric conditions (such as asthma and pneumonia). This study showed that those with obesity accrued higher charges than those without obesity. A similar finding was demonstrated by Nafiu, Ndao-Brumlay, Bamgbade, Morris, and Kasa-Vubu (2007) who showed that among pediatric patients admitted for tonsillectomy and adenoidectomy, those who were obese had higher charges that those who were normal weight.

Extrapolating from studies carried on obese adults showed that obese patients may experience a higher severity of respiratory symptoms because of altered physiology, and that obesity may also lead to an increased complexity of procedures as cited by Varon & Marik (2001), it is hypothesized that similar mechanisms account for the higher costs seen in hospitalized obese children.

More recently, Hampl, Carroll, Simon, and Sharma (2007) explored the costs of obesity associated with outpatient care. Again, higher costs were found for obese children than for the normal weight peers. This underscores the impact of obesity on health care for children in all arenas.

Childhood Obesity Interventions

In 2007 an expert committee convened by the American Academy of Pediatrics, and including organizations such as the American Medical Society and the American Dietetic Association, published guidelines for the prevention and treatment of childhood obesity (Barlow, 2007). This outlines the types of interventions that have been implemented in an effort to impact obesity among children. Starting out with prevention, it is clear that school based programs can have marginal success with preventing the onset of obesity among children. One of the most prominent school based projects was the Planet Health Study implemented in Massachusetts (Gortmaker, Peterson, Wiecha, Sobol, Dixit, Fox, & Laird, 1999). In this study a school based curriculum focusing on healthy nutrition and increased activity was implemented for middle school students. The results showed only a small effect on changing the weight trajectory of participants. Despite the limited success of school based programs, schools are still viewed as an important venue for prevention efforts. It is believed however, that to increase the

likelihood of success, more stake holder in schools, such as school nurses, school counselors, and parents will need to be incorporated into interventions (Larrier, 2011).

When prevention efforts have failed, the next step is to address treatment. The AAP recommends that treatment efforts start in the primary care office. Here there is the potential for many members of staff to participate in delivering weight management content for parents. For example, the guidelines suggest that the environment of the office be transformed into a health weight office. This is something well suited to nursing staff who could work to ensure that posters, displays and brochures provide information about healthy eating and physical activity. In addition, nurses are often involved in weighing and measuring patients and as such they are at the front line of determining whether a patient's weight is above the healthy range.

Along with creating a healthy weight environment, primary care physicians have the responsibility of delivering the first level of care. Research has shown that primary care physicians face many barriers to addressing obesity and often do not meet treatment recommendations (Woolford et al., 2008). In a study exploring physician and nurse perceptions of their treatment of obesity providers reported low self-efficacy for treating obesity appropriately, and expressed a need for greater training regarding this topic (Barlow & Dietz, 2002). In response to these data, a number of primary care interventions to address childhood obesity have focused on improving physician practice (Perrin, Flower, & Ammerman, 2004). However, these studies have not demonstrated whether improvements in physician knowledge lead to significant improvements in their patients' weight status.

In a recent study of an intensive primary care intervention (Taveras et al., 2011) found that it was not successful in reducing obesity among affected children. This High Five intervention utilized motivational interviewing delivered by physicians and provided families with education about healthy lifestyle practices. While it had some positive trends the only significant improvement noted overall was a reduction in participants' screen time. This lack of effectiveness related to primary care interventions likely indicates the need for multiple providers to address obesity in a variety of environments and that the level of intensity possible solely through contact with primary care physicians is insufficient to achieve significant or sustained results (Taveras et al., 2011).

In recognition of the limitations of primary care services, the expert committee indicated that for many obese children interventions from multidisciplinary teams is often necessary. Such teams should include a variety of professionals including medical personnel, psychologists, dietitians, social workers and exercise physiologists. Diverse teams of this nature have the capacity to help patients address the multifaceted problems associated with obesity and thereby have a greater likelihood of promoting weight loss than can be achieved in the primary care setting. These interventions typically include weekly program visits, most of which include educational, exercise, and behavioral components. The expert recommendations also indicate that programs should monitor changes in patients' anthropometrics and metabolic measures. However, few of these multidisciplinary interventions have published results. Furthermore, in cases where interventions have published results, the outcomes have been modest. Early studies of intensive family based interventions with obese children between 7 and 12 years old, (Epstein, Myers, Raynor, Saelens, 1998) demonstrated the ability to significantly

decrease BMI. In addition, the Trim Kids intervention also showed positive results for this age group, using similar methods (Sothern, Schumacher, von Almen, Carlisle, & Udall, 2002). However, these results have not been widely replicated particularly when extrapolated to treat adolescents. In one of the largest and longest interventions to treat obese adolescents conducted at Yale University, participants in the intervention arm increased their BMI during the course of the intervention, but their BMI increased less than those in the control group (Savoye et al., 2005). In a smaller clinical multidisciplinary intervention which included more individual therapy for participants, adolescents were noted to decrease their BMI over the course of 6 months, but only by 2.2 BMI units (Woolford, Sallinen, Clark, & Freed, 2011).

The modest results of clinical interventions to date, has led to the use of bariatric surgery as an intervention to treat severe obesity when less invasive methods have not been achieved the desired results. The number of adolescents undergoing bariatric surgery has increased (Schilling, Davis, Albanese, Dutta, & Morton, 2008) over recent years as this procedure has become more readily available. Inge, Jenkins, Zeller, Dolan, Daniels, Garcia, Brandt, Bean, Gamm, and Xanthakos, (2010) demonstrated that bariatric surgery leads to significant weight loss and improvements in obesity-related illnesses such as type 2 diabetes, sleep apneoa, and non-alcoholic fatty liver disease. However, no long term results are available due to the nascence of adolescent bariatric surgery programs. If studies for adults are predictive of what can be expected among adults, although bariatric surgery may be associated with significant health improvements for some patients, it will not prove to be the key to achieving a normal weight for most patients, due to the need to make lifestyle changes in tandem with the surgery.

These interventions in the US underscore the need for novel approaches to addressing childhood obesity, which will likely need to include a wider range of professionals in interventions than has been traditionally the case. It also suggests that at this stage there are few proven strategies that can be adopted from the US to be delivered in other settings. It is likely that adaptations and enhancements will be needed in order to utilize the lessons learned from the US to the Caribbean.

To add to the observations already made, these desired adaptations and enhancements may be informed by using Beattie's model to analyze the interventions described above, with a view to identify possible room for improvements with regard to them being driven more by negotiation and focused more inclusively towards the individual and the community.

Although there have been some childhood obesity interventions done in the Republic of Trinidad and Tobago, to date, few studies have been published. For instance, the "Healthy Me Camp" is a well-established yearly intervention for overweight and obese children that has not yet been published as a study. On the other hand, there is the published study that could be noted, i.e., a randomized controlled, school-based nutrition education and physical activity intervention in Sangre Grande, Trinidad. The participants were 579 students in their sixth year of primary school education of whom 23% had BMI $\geq 85^{th}$ percentile. The result was that the intervention was associated with "lower intake levels of fried foods, snack foods high in fat, sugar and salt (HFSS) and sodas." and, with "higher knowledge scores independent of age, gender, BMI, ethnicity and the appropriate baseline value." (Francis, Selby, Nicholas, & Dalrymple, 2010, p. 738). However, the intervention was not associated with changes in physical activity. One other report of

childhood obesity treatment in the island of Trinidad is a case report of bariatric surgery on a 6-year old severely obese child (Dan et al., 2010). This serves to suggest that less invasive interventions are needed to avoid the need for surgical intervention, if possible.

Although there are many studies documenting and defining the problem of obesity in the Caribbean, widening the search for childhood obesity interventions to include the Caribbean at large reveals only one additional report. In 1992 the Project Lifestyle intervention was implemented in Antigua, and a report was published describing the school based intervention to improve eating habits, physical activity and self-concept. However, results of the intervention outcomes have not been published (Sinha, 1992).

This dearth in reports of interventions in the Caribbean indicates the need for further work in this area. There is a need for well informed, evidence-based approaches to addressing childhood obesity and an appropriately trained nursing workforce have the potential to impact this problem. From studies exploring the role of nurses in childhood obesity prevention and treatment we know that nurses are well placed to work with children, parents and, teachers in trying to combat the issues of childhood and adolescent obesity. Previous studies have shown their involvement in many interventions in the U.S. and in one study in the Republic of Trinidad and Tobago.

There has been some success in a few areas of obesity treatment however, several barriers have been identified, e.g., lack of skills and lack of time to carry out assessments (Barlow & Dietz, 2002). The lessons learned from these studies can inform the development of effective interventions in the Republic of Trinidad and Tobago.

Future Directions

Given the rapid increase in the prevalence of childhood overweight and obesity reaching epidemic proportions in the United States Ogden et al. (2006) the Department of Health and Human Services called together a panel of experts in the field of child and adolescent obesity in 1997. Stemming from this panel, a number of guidelines and recommendations were published to guide physicians, nurse practitioners and dietitians in the evaluation and treatment of childhood obesity (Barlow & Dietz, 1998; Cook, Weitzman, Auinger, & Barlow, 2005; Sokol, 2000). As the medical field began to speak out against this rising problem it drew the attention of the media which began to publish articles about the issue in an attempt to raise the awareness of health care providers and the public. One example was *Action for Healthy Kids*, (2006), and Taubes (2000) was another such initiative which was used to raise public awareness. Recently, the North American Association for the study of obesity (NAASO) reported that the number of articles related to childhood obesity and overweight appearing in the U.S. newspapers and journal articles has more than tripled in five years between 1999 (8,000 articles) and 2004 (30,000 articles); NAASO, (2007). This is a reflection of the amount of attention currently focused on this problem.

Yet, as published in *Medicine of the National Academies*, (2005), and in Ogden et al., (2006), despite the increase in information available, the data up to 2003-2004 showed that the prevalence of overweight and obesity among children and adolescents had continued rising up to 2003. Since then however, it has been noted that US prevalence has remained stable between 2003 – 2004 and 2009-2010, (JAMA, 2014). Part of the reason for the earlier limited success experienced in dealing with this epidemic is considered to be non-compliance with recommendations for treatment promoted by

healthcare providers. In addition, some of the barriers to the assessment and treatment of childhood overweight and obesity, as identified by Barlow, Dietz, Klish, & Trowbridge, (2002) and other researchers are, (a) limited time to conduct an appropriate assessment of affected children; (b) lack of clinician knowledge about treatment; and (c) reporting of inconsistencies in their evaluations and treatment, indicating that they did not feel well prepared to effectively oversee the health care of affected children. Health care providers, although acknowledging the issues of the epidemic, struggled with how to affect this critically emerging health care dilemma (Vaughan, 2005); and hence, gaps in knowledge, and, practice that is inconsistent with recommendations and research evidence, are all likely to cause delay or inadequate recognition of excessive or unhealthy weight gain and so limit the effectiveness of early prevention or treatment efforts. Of significance also is the observation of Headley et al. (2004) of deficits that have been noted in some particular areas such as counselling treatment in relation to nutrition and activity to parents of preschool children. Furthermore, providers, in treating childhood obesity, continue to report low self-efficacy and several other barriers to children following treatment recommendations. The following Table shows the barriers identified and listed by Sonneville, K.R., La Pelle, N., Taveras, E.M., Gillman, M.W. and Prosser, L.A. (2009)

Table 3. Barriers and facilitators to adopting obesity prevention recommendations cited by parents.

Obesity Prevention Recommendation	Barrier	Facilitator
Reduce time watching TV	Monitoring/Time cost	Availability of acceptable alternatives
Remove TV from child's bedroom	Difficulty with changing habits Parity with other family members	Early limit setting
Increase physical activity	Time cost Lack of information Lack of transportation Child preference Safety Dollar cost Need assistance from family members	Availability of acceptable alternatives Enlist outside support
Participate in school/community-based sports	Practicality/Time cost Child preference	Access
Walk to school	Safety	None identified
Walk more in general	Child preference	None identified
Eat less fast food	Need assistance from family members! Child preference/Convenience Time cost	Information about dollar costs Parental behavior change
Provide a healthier diet	Parity with other family members Dollar cost Child preference Difficulty with changing habits	Parental behavior change Involve the child Limit setting Make behavior changes gradually

Other identified barriers include lack of support services; futility or ineffectiveness of treatment efforts; lack of reimbursement for treatment; lack of time for providers to address all necessary issues, and other topics seem to require greater priority in the short visit times allotted. (Spivack, J.G., Swietlik, M., Alessandrini, E. & Faith, M.S. (2010) p. 1345 Table 3)

Many of these barriers reflect provider perceptions. In order to address obesity and optimize treatment it may be important to address these issues. Better outcomes expectations and improved self-efficacy in treating obesity may lead to improved treatment results. There is currently a gap in the literature and room for future research to address the role of changing perceptions in the treatment of obesity.

Policy and Leadership

In 2006, two members of the 'Knesset', the Israeli parliament, proposed a new law banning the advertisement of unhealthy food products during prime time. This was done as part of the government struggle against childhood obesity. Sweden has banned the use of cartoons to promote food to children. Comprehensive research conducted in England supports such legislation and found that the advertisements of food products directly influence the behaviors of children and their food preferences.

Currently however, the results in obesity prevention among children worldwide have been disappointing. From the data presented, a large number of children still suffer from overweight and obesity. So far, treatment and other interventions have not been able to reverse the current crisis. It would seem that to truly have the required impact to reverse the trend, interventions will be needed and strengthened at all levels. Yet, currently the main focus, not only in the Caribbean, appears generally to be on promoting

changes in dietary and physical activity behavior focused at the individual and the group. There is therefore a need to widen the focus from this narrow perspective of inviting people to change their behavior and improve their quality of their diet and their physical activity level, in an environment in which there are plenty inducements to engage in behaviors where the outcomes are going to be quite the opposite.

I am therefore in full support of the notion that the critical need now is for the enhancement and expansion of public policy, and it should be directed towards environmental and population strategies, while still in support of individual and family strategies. This approach would inevitably involve paying attention to the fact that advances in technology and consumer culture have led to an obese global environment, and it has been shown that these global increases in obesity are “grounded in globalization of food systems and consumer culture and they have increasingly penetrated all societies” (Sobal, 2001, p. 1137).

The literature suggests therefore, that, given the complexity of obesity, totally removing all causes is impossible, and seeking to link it to a single cause is unwise, therefore our approaches to interventions would need to be informed by, and focused on, not primarily the individual’s biology and behaviors, but more significantly on the complex collective elements of his environment, i.e., social, economic and political structures and characteristics of culture. Accordingly, prevention programs with a multi–sectoral approach are found to be of more help in stemming the epidemic than individual weight-loss programs.

Henry (2007), in *Combating obesity and NCD’s in the Caribbean: The Policy Perspective*, points out that in the Caribbean, largely educational approaches have been

used to fight obesity, and that it is now important to take the next step of implementing an effective public policy strategy. In this way the whole population will experience a reduction in exposure to obesity promoting forces. He continues, that such public policy will have to give special attention to certain characteristics of the Caribbean, i.e. small economies with rapidly expanding liberalization of trade in food and services, so that public policy therefore, would need to target drivers of obesity in all aspects of the environment, i.e., physical, psychosocial and economic, and should be in keeping with the principles of the Caribbean Charter of Health Promotion (1993). His concluding recommendations for changing diet and lifestyle factors in the Caribbean are by:

1. Regulating and modifying the food supply (to make healthy foods available;
2. Providing fiscal incentives and disincentives in order to make healthy foods more affordable;
3. Educating individuals and communities (to make healthy lifestyle choices). (p. 3)

Regulations and Standards

Regulatory guidelines recommended at the societal level should be considered, such as the following: legislation on nutrition labeling, advertising codes, fiscal incentives and taxation disincentives, healthy choices for fast food franchises, strengthening of regulatory bodies, food import restrictions, high-fiber food production increase, promotion of dietary guidelines and exercise habits at worksites, and the building of recreation facilities (Henry, 1998).

Conclusion

The observed increased in the prevalence of early childhood overweight and obesity between 1990 and 2010 has understandably been the result of many factors over time. The factors include changes in nutrition, physical activity, environmental factors, social and community factors and government policy factors.

If this increasing prevalence is not reversed the implications are enormous for health care expenditure in the future, and for the overall national development. Interventions so far have mainly been targeting the individual. They are resource intensive and have limited potential for lasting success as long as environments promote unhealthy behaviors and limit access to healthy foods and safe opportunities for physical activities (Story, Kaphingst, Robison- O Brien, & Glanz, 2008).

Effective control of obesity requires a shift away from the traditional focus on physician clinical management only and should include a wider range of providers addressing a variety of environments, including those in which the weight-related behaviors occur. Vital to the success of this approach will be the participation of all health professionals, educators, legislators, business people, parents and those involved in Health Promotion. Leadership and advocacy from Health Professionals and Scientists is required to bring about these changes.

Changing policy is a long, complex and a multi- step process, involving the continual modification of existing policies and development of new policies. Influencing the many different sectors can be very challenging e.g. transportation industry, food industry, special interest groups, policy makers and the broader socio-political environments.

CHAPTER 3

METHODOLOGY

Introduction

The increase in childhood obesity in recent decades is seen as a formidable public health challenge (Henry, 2001). The problem is global, affecting many low and middle income countries, particularly in urban settings. It is important to note that about 35 million of obese under-five children are living in developing countries (De Onis, Blossner, & Borghi, 2010). In a report of the PAHO Caribbean Commission on Health and Development (2006), it was pointed out that in the Caribbean, five times as many people die from non-Communicable Diseases (NCDs) in the region, as die from all the other illnesses combined, hence this rising obesity epidemic needs to be seriously addressed, as it is the common factor associated with increased risk of chronic NCDs. The Report then discussed some of the policy options available to member countries of the Commission.

Seeing then that obesity is one of the key drivers associated with major chronic diseases, e.g. Cardiovascular disease, type 2 diabetes, hypertension, and some cancers (CNCDs); it is even more alarming for Trinidad and Tobago, that some of these chronic diseases are already being seen in the children and youth populations of the country. Therefore, the then Prime Minister of Trinidad & Tobago, recognizing this link between obesity and chronic diseases and the tremendous burden which it places on the health

care system has indicated that the government of the Republic of Trinidad and Tobago has already been making policies in an attempt to address the problem. Accordingly therefore, the research questions for this study are:

1. What obesity prevention and treatment policy interventions are currently available for school aged children 6-12 years old in the Republic of Trinidad and Tobago?

2. What are the perceptions and challenges experienced by implementers and parents of overweight or obese children?

3. How do policy makers and Health practitioners perceive their current impact on childhood obesity trends in the Republic of Trinidad &Tobago?

My purpose for pursuing the above questions is to explore the views of health policy makers, health practitioners and parents, with respect to the current efforts being made in the country to respond to the problem; and, to explore the contextual conditions of the current interventions in a representative rural and urban sample, chosen from two of the Regional Health Authorities in the Republic of Trinidad and Tobago.

Research Design

In Creswell's (2013) description of five approaches to qualitative research, case study methodology is the research design that, due to my research question, I consider would best uncover knowledge and provide perspectives that would contribute towards gaining increased understanding of the issues involved in dealing with the childhood obesity problem in the Republic of Trinidad and Tobago. This is supported by Merriam (1998, p.29) who characterized case studies as "particularistic, descriptive, and heuristic." Accordingly, research that uses the case study method would be particularly effective at

bringing to the fore the experiences and perceptions of individuals from their own perspectives and experiences.

Further, in the design for case study research, the definition of a case as proposed by Miles and Huberman is “a phenomenon of some sort occurring in a bounded context” (as cited in Baxter & Jack, 2008, p. 545). By definition, bounding can be, bounded by time and place (Creswell (2003), or, by time and activity, Stake (1995), or, by definition and context, Miles & Huberman (1994), and this is done in order to ensure the scope of the study is appropriately limited.

Consequently this overall approach is concerned with the experiences of the participants, the process, the context, and discovery. The qualitative design will accordingly be exploratory and descriptive in nature. In my research design I will be using qualitative methodology, employing a combination of policy review and case study research. The policy review would consist of an analysis of health policies and other health service documents relevant to addressing childhood obesity and combating its rise in the Republic of Trinidad and Tobago.

According to Stake, (as cited by Hyett, Kenny & Dickson-Swift, 2014, p. 166) “each case study is a concentrated, single inquiry, studied holistically in its own entirety” so case study researchers are urged for each case to identify what are the commonalities and particularities about the case in terms of its nature, e.g., its history, its location or setting, and its context (Stake 1998). Hence my chosen Health Centers were selected because they were both well established, one in a rural setting, the other urban located, and both providing service to schools and community representative of the diversity of the country of Trinidad and Tobago.

A case study protocol (see Appendix A) has been developed giving consideration to matters of validity and potential bias, and, according to Yin (2012), ensuring that all elements of the case are analysed and adequately described. For each of the two cases that will be used, the research procedures will be replicated in similar fashion and overall analysis will be done individually.

The Population/Sample

According to Creswell (2012) selecting people or sites who can best help us understand our phenomenon is called purposeful sampling. This strategy is used to develop a detailed understanding by eliciting useful information about the phenomenon. The purposeful sampling in this study has been done so as to develop two possible perspectives, hence my choice of sites is based on location, i.e., one rural, and one urban. In keeping with this, I have confined my study to only two cases; i.e., The El Socorro Health center in the urban district of St. George East, and, The Manzanilla Health Center in the rural district of St Andrew/St David.

A further reason for choosing these two centers for the study, apart from their difference in location, and their proximity to large primary schools, is that in the past five years, these centers stood out in terms of their efforts and initiatives to engage children and their parents in regionally promoted obesity prevention intervention programmes, hence the expectation is that they should have a rich source of experiences on which to draw. The participants will be drawn from:

- Policy makers, who have been involved in the making of the relevant health policies; Permanent Secretary, Ministry of Health; Director of Health

Education of Trinidad & Tobago who has the responsibility of policy implementation.

- Health Practitioners, e.g. school nurses, District Health Visitors (DHV), Health Center Doctors and Dieticians and Regional Health Managers as the work of Health Promotion is mainly decentralized to the Regions.
- Parents of children served by the Health Center who form the focus groups.

These participants are all currently employed in the roles mentioned, and the politicians would have been elected and employed for the last five years.

Self as the Research Instrument

In carrying out this research, I am stating my own background, my interest and my history. I am a registered nurse, Health Visitor and a nurse Educator, trained and practiced in the UK. In my present assignment, I am the Director of the Nurse Education Department at a university in the Caribbean. The local Ministry of Health in 2011 has adopted health promotion as the main strategy to achieve changes conducive to the development of healthy lifestyles and wellbeing. This is an area of interest for me having studied and researched Health Promotion at the Masters level (MSc.). My interest in this area has continued whilst pursuing this PhD. Having returned to Trinidad and working in the Health care system, I became very aware of the high level of the prevalence of childhood obesity. It is in keeping with this interest and awareness that I decided to research what is being done to address this epidemic in the country.

Data Collection

Data will be generated by document analysis, by observations, by interviewing individual school nurses, health visitors, community dieticians, center managers, and community doctors assigned to the selected schools, and, by focus groups interviews

Sources of Data

For this research I will be using five sources of data: documents, observations, interviews, focus groups and my research diary. I anticipate this variety of data will give me an opportunity to describe the phenomenon of childhood obesity from multiple perspectives and increase the likelihood that I will be able to develop rich descriptions of how policies are being implemented in these settings. Each source of data is described below.

Documents

A collection will be made of all current relevant health policy documents from 2005- 2015, and also of all related Health Center documents, and newspaper articles. These would include The Trinidad and Tobago National School Health Policy (2009), and The Trinidad and Tobago Report on the Global School-Based Student Health Survey (GSHS) of 2007.

Observation

It is important for me to observe and describe the physical settings and other institutional and other political contextual factors (Stake, 1998) in which the research is being carried out. The focus will be to note, (a) the environment in which the interview is to be carried out, (b) the enthusiasm or otherwise of the interviewee for the topic of

interest and (c), an observational protocol (field note form) will be used as described by Creswell (2012, p. 216) to facilitate recording of my observations. (see Appendix C).

Interviews

Face to face interviews will be conducted with selected participants. A tape recorder will be used to capture the conversations and experiences of the participants. Participants will be listened to closely without influencing or directing their answers. These will therefore be in-depth interviews lasting about one hour and thirty minutes. If an interviewee is unable to complete the interview due to some unforeseen emergency on their part, a second visit will be arranged. A protocol has been created for the interviews, based on an adaptation of the study done by Nicola Hall et al., titled Preventive Public Policy and Childhood Obesity: Case Studies in England and the Netherlands. (See Appendix D). Interview questions are designed to be open-ended, evolving and non-directional, Creswell (2012) and generally there is an over-arching question followed by sub-questions. The interviews will be tape recorded and transcribed verbatim.

Focus Group

Of the parents of the children who have been referred, the Health Visitor/ School Nurse will be asked to identify a convenient sample of six parents who will be willing to be part of a focus group. Having had their consent those six (6) parents from each case study site will be the focus groups. The questions that will be asked of them will be:

1. Describe what your feelings were when you were first told that your child was over-weight or obese?

2. Describe your reactions when you were told about the program to be followed and the recommended lifestyle changes that had to be made to address the problem?

3. What were your experiences as you tried to follow the recommendations faithfully?

4. What about your culture makes it difficult or easy for you to address the problem?

5. On reflection, what would have been helpful to you to prevent this problem?

The aim of the questions is to give these parents the opportunity to talk freely in a safe environment about issues or concerns of obesity. Open-ended questions are therefore being used so that their views and their perceptions about childhood obesity will be captured. The sessions will be tape recorded. The parents will be given the assurance about the confidentiality, use and destruction of the taped material, and they will have the opportunity to read the transcribed material to assess authenticity.

Researcher Diary

A research diary will be kept to facilitate the recording of all relevant observations. The electronic recording files, interview notes and finally the case study report will be submitted to the peer debriefing team in order to ensure reliability and repeatability.

Procedures

Letters requesting consent (see Appendices E & F) and permission to conduct interviews and review the health policies will be sent out as appropriate to the regional nurse managers, the senior dietician, the chief medical officer, the permanent secretary to the Minister of Health, and to the Andrews University IRB.

Having gained consent, data will be collected from the Ministry of Health (T&T), and from two Community Health Centers in two different Regional Health Authorities of

the Republic. I will be contacting all the listed participants/interviewees by emails, letters and personal phone calls prior to my initial introduction to the interviewees. Having done that I will make appointments to do a site visit to meet with the center managers which will give me a greater understanding of the operations of the centers and will allow me to make some observations e.g.:

(a) What is the atmosphere like at the centers.

(b) What is the state of the environment and facilities available to staff.

Having completed these, appointments will be made with each individual interviewee for a pre-arranged time to start collecting data. (Samples of the letters are in Appendix H). The interviews will be conducted in the Regional Health Centers in the offices of the respected participants. The interview with the Director of Health Promotion will be held in her office at the Ministry of Health. Attention to the security and confidentiality in conducting the interviews throughout the research will be maintained both with the organizations data collected and the individuals participating in the interviews.

While conducting the research, the data and information collected will be stored and filed in a locked filing cabinet in my office in a secure and confidentiality conscious manner at the University of the Southern Caribbean. In any case where I may not be allowed to take away data, I will attempt to view only, and follow up with a brief description in my report.

Data Analysis

The US Center for Disease Control and Prevention (CDC) has produced an Evaluation Framework for Obesity Prevention Policy Interventions which I plan to use to

inform the approach I take to do my documents analysis. The Framework is shown in Appendix B. Beyond this, my study being qualitative by design, the data analysis will have unique steps, moving from specific to general, and would involve multiple levels of analysis of the data. By means of inductive data analysis, patterns will be built up, and, categories and themes will emerge from the bottom up, by organizing the data into increasingly more abstract units of information. This inductive process facilitates working back and forth between the themes and the database until a comprehensive set of themes have been established (Creswell, 2007). In analyzing the data I expect to be involved in going deeper and deeper into understanding the data, and interpreting the larger meaning of the data. It is an ongoing process, continually reflecting about the data, asking analytic questions and writing memos throughout the study. To aid in this analysis, and being aware that analysis should be conducted concurrently with data collection and making interpretations and writing reports, I consider it important to do this as the information gleaned can be used in the final report. During this process, significant statements will be analyzed, and there will be the generation of “meaning units” and an “essence description” as described by Moustakas (1994, p. 9).

Creswell’s (2007) diagrammatic representation of the process suggests a linear approach, building from the bottom up, but he states that in practice, it can be interactive and interrelated. He suggests the following four steps to the data analysis process:

1. Organize and prepare the data for analysis which involves transcribing the interviews. Optically scan material, type up field notes sorting of the data into different types.

2. Read through all data obtaining a general sense of the information reflecting on all its meaning paying attention to tone, depth, credibility, and use of the information.

3. Start detailed analysis with a coding process. This is needed in order to start organizing all of the material into segments of text before bringing meaning to the information. Then these segments or categories should be named. To assist in this coding process, I will use the 8 steps as described by Tesch (1990) as a guide or systematic process in the coding of my data e.g., get a sense of the whole by reading all of the transcriptions; pick one document and go through it asking the questions what is this about; after going through several of these make a list of all the topics and the clusters; abbreviate the topics as codes, then put them next to the appropriate segments to see if new categories or codes emerge; group topics, name them but show interrelationships; make a final decision on the abbreviation of each category and alphabetize the codes; Assemble the data for each category in one place and do a preliminary analysis; then if necessary, I will recode my existing data.

4. The final step in the data analysis will be the interpretation or meaning of the data. Asking what are the lessons learned? Is the essence of the ideas captured as suggested by (Lincoln & Guba, 1985). Interpretation in qualitative research can take many forms and can be adapted from different designs and be flexible to convey personal research-based, and action meanings.

Trustworthiness

For a study to be considered trustworthy, Guba (as cited in Shenton, 2004, p. 64) proposed that there were four criteria that should be considered, and:

> by addressing similar issues, Guba's constructs correspond to the criteria employed by the positivist investigator: a) credibility (in preference to internal

> validity); b) transferability (in preference to external validity/generalizability); c) dependability (in preference to reliability); d) confirmability (in preference to objectivity).

To succeed in doing qualitative work with these characteristics, I must, ensure, according to Russell, Gregory, Ploeg, Dicenso, and Guyatt (2005) (as cited in Baxter, 2008, p.556), that:

> (a) the case study research question is clearly written, (propositions if appropriate to the case study type) are provided, and the question is substantiated; (b) Case study design is appropriate for the research question; (c) Purposeful sampling strategies appropriate for case study have been applied; (d) Data are collected and managed systematically; and (e) The data are analysed correctly. (Russell, Gregory, Ploeg, DiCenso, & Guyatt, 2005)

Credibility

As stated above, credibility is the qualitative researcher's preferred term to the positivist's term "internal validity", and to meet this criterion, Guba (1981, p. 84) recommends:

> while doing(during) the study, use prolonged engagement, persistent observation, and peer debriefing, do triangulation, collect referential adequacy materials, and do member checks, and after completing the study, establish structural corroboration or coherence establish referential adequacy, and do member checks, in the hope that these actions will lead to credibility, and produce findings that are plausible. (p. 84)

Accordingly, I will ensure that the participants' perceptions match up to my portrayal of them, accurately representing not only what they say but what they think, feel and do. I shall clarify at the outset what biases I bring to the study and I will be monitoring these by keeping a journal. I will try to spend as much time as possible with participants so as to ensure substantial connect in the field, and the data will be collected

from multiple sources as real life is composed of different perspectives. Colleagues will also be asked to be involved in the process of checking on the consistency between raters.

Triangulation

In qualitative studies, triangulation is a method used to check and establish validity and trustworthiness of the study. It requires that data is collected by different methods, from different sources and from a variety of perspectives. Denzin (1978) articulated four types of triangulation, i.e., data, methodological, theoretical, and investigator. According to O'Donoghue and Punch (2003, p. 78), triangulation is a "method of cross-checking data from multiple sources to search for regularities in the research data".

The study will therefore aim at requiring the analysis of the research question to be pursued from multiple perspectives so that the collection of data from an array of sources data will be evident e.g. interviews of several individual participants, reviews of policy and press documents, data from focus groups observations, and all triangulating on the same set research question.

Further, I will engage in data triangulation whereby participants are chosen, and, environmental triangulation whereby locations urban and rural will be researched. The comparison of the data from these different perspectives will enhance data quality and validity of the findings where convergence and or confirmation occur.

Peer Debriefing

Peer debriefing is described by Onwuegbuzie, Leech and Collins (2008, p. 3) and they indicate that "One way to obtain and use reflexive data from the researcher is by debriefing the researcher. Specifically, to debrief a researcher, someone who is not

involved in the study interviews the researcher and collects debriefing data." The use of peer debriefing will therefore be carried out to enhance validity of the data.

Audit Trail

The issue of dependability parallels that of reliability in quantitative studies. To address this, detailed and thorough explanations will be given as to how the data were collected and analyzed, thus providing an *audit trail*, and findings which are not ultimately included in my conclusions will be placed in Appendix I.

Generalizability

By "generalizability" is meant the degree to which the findings can be generalized from the sample to the general public. The goal of this qualitative study is to engage in "in-depth" exploration of the situations in which policies and interventions are occurring. As such then results can make a valuable contribution to the effectiveness of efforts in the country to alleviate the problem. It is believed by some that is difficult to generalize from one case to another as qualitative research is still generally considered not to be scientific due to how data is collected and bias which may been allowed. Yin (as cited in Zucker, 2009, p.10) argues that "theoretical generalization is to the domain of case study what statistical generalization is to the true experiment" and advises case study analysts to generalize findings to theories, as scientist generalizes from experimental results to theories. However, the literature reveals three main approaches to generalization in qualitative research. They are empirical, analytic, and case-to-case. In case-to-case, transferability of the findings would not be general, but to a specific other situation, and Maxwell and Chmiel (2014, p.541) state that "This shifts the responsibility for making generalizations from the researcher to the reader or potential user of the findings" and

Misco (2007, cited by Polit and Beck, 2010) has called this "reader generalizability." I intend to provide sufficient details for users of my findings to make reasonable assumptions about transferability to their specific situation.

Ethical Considerations

Ethical planning will be an integral part of the research process. There will be an Informed Consent Form for participants to sign before engaging in the research, and, to protect anonymity and confidentiality of the participants in my study I will use pseudonyms for the participants and places in order to protect identities. All of these details are included in my plans for research which have been clearly stated and reviewed by the AU Institutional Research Board (IRB).

My signed written commitments in the informed consent letters will be the formal agreement given indicating that the data collected from any individual person or from the organizations will be owned by me and will not be used in any research report or publication that may incriminate or identify them as individuals or as an organization.

In the interpretation of the data more than one strategy will be used to check the accuracy of the data with participants across the different data sources. Words or language that are biased or insensitive against participants e.g., gender, race, sexual orientation, disability or age will not be used. The word *participant* will always be used rather than *subject*. Further, falsifying, suppressing, or inventing findings to meet my needs or others will be avoided.

Finally, the data once analyzed would be kept for a reasonable time according to Sieber (1998) who recommends 5-10 years and then it will then be destroyed so that it will not be used inappropriately.

The study will be carried out in such a way that no serious ethical problems will be caused.

Summary

Case study methodology has been used as it allows for exploration and description of the situations in which childhood obesity interventions are been carried out. In so doing the stories will bring out what is unique, special or interesting, about the individuals, organizations, institutions and policies. The qualitative data thus obtained from the audio recordings of interviews, from focus groups, and from the relevant documents reviewed should be a rich potential source to identify new insights and perspectives in the pursuit of the research questions.

CHAPTER 4

DATA ANALYSIS AND FINDINGS

Introduction

As indicated earlier, the Prime Minister of Trinidad & Tobago, recognized a link between obesity and chronic diseases and the tremendous burden which this relationship places on the health care system, and he indicated that the government of the Republic of Trinidad and Tobago had already been making policies in an attempt to address the problem. In the light of this therefore, the research questions that have been pursued for this study are as follows:

1. What obesity prevention and treatment policy interventions are currently available for school aged children 6-11 years old in the Republic of Trinidad and Tobago?

2. What are the perceptions and challenges experienced by implementers and parents of overweight or obese children?

3. How do policy makers and Health practitioners perceive their current impact on childhood obesity trends in the Republic of Trinidad &Tobago?

My purpose for pursuing the above questions is to explore the views of health policy makers, health practitioners and parents, with respect to the current efforts being made in the country to respond to the problem; and, to explore the contextual conditions of the current interventions in a representative rural and urban sample, chosen from two of the Regional Health Authorities in the Republic of Trinidad and Tobago.

To achieve this purpose, I decided to utilize case study methodology as the research design for my project. The merit of this methodology is well defined in the literature by Creswell 1998, Bassey,1999, Mercian 1998, Stake,1998, Sturman, 1997, and Yin 1993, and as such, I consider this approach would best help me to uncover knowledge and provide perspectives that would contribute towards gaining increased understanding of the issues involved in dealing with childhood obesity in the Republic of Trinidad and Tobago.

Data Collection

After careful deliberation I decided that the two sites (cases) for the collection of my data, would be one Health Center in an urban area, and one in a rural area, both in the island of Trinidad. Having gained permission from the ethics committee of the two Regional Health Authorities in which the Health Centers are located and from the Ministry of Health, I was then able to approach the Primary Health Manager of both Health Centers for permission to interview participants. Purposeful sampling was used, because I expected such selected participants would be able to illuminate/inform regarding the issues raised in my research questions (Cheswell 1998, Patton 2002). The chosen participants selected from the two Health Centers and the Ministry of Health were six females and one male. In addition, I had planned to interview also, a focus group from each area consisting of parents. In actuality, due to Covid-19 pandemic issues and the government's "stay at home" policy, only one parent attended and was interviewed. As a result, the final set of participants who took part in my study included Health Practitioners, Dietitians, and Medical Officers from both Regional Health Authorities, Ministry of Health personnel, and one parent. I met with all of them at appointed times

and was welcomed warmly by all. As we talked I was shown into their offices and we sat down and began by reintroducing ourselves since we had already talked on the phone when appointments were made for the meetings. Rapport was established and as I started to explain the purpose of my study, they all expressed their interest in the research. This interest was maintained throughout the whole interview as I went about collecting the data. All the health participants were very experienced in Primary Health Care and had been in their positions for many years. I began collecting data in February 2016 and concluded the last interview in April 2016.

In conducting the interviews, I used a semi-structured approach and held all of the interviews in the office of the interviewee. The parent was interviewed in a private room at the area Health Center. All the interviews were recorded, having first obtained permission from the interviewee. After the interview, according to Kavale (1996), I then transcribed all the recordings verbatim, and sought endorsement of all the transcripts. Having done this, I made a summary of the issues arising from each interview, noting particular statements, phrases that illustrated particular points of interest of my research.

Data Analysis

Creswell's (2007) diagrammatic representation of the data analysis process suggests a linear approach, building from the bottom up, but he states that in practice, the process can be interactive and interrelated. Accordingly, he suggests four (4) steps to the data analysis process which I have followed and blended with Thomas (2006). The following Table 4 shows:

Table 4: Data Analysis Steps

Stage 1	Stage 2	Stage 3	Stage 4	Stage 5
a) (S1) Organize the data – transcripts and Field Notes. b) (S2) Read through the verbatim transcripts of the interviews.	c) (S3) Code the transcripts by identifying all specific segments of text that relate to the research questions	d) Label the segments to create named categories	e) (S4) Reduce the number of named categories by removing overlap and redundancy among the named categories; and noting inter-relationships f) Assemble the data for each category in one place for final analysis into themes	g) Use the most important categories to form resultant themes
RESULTS				
Pages	Segments	Categories	Categories	5 Themes

Adapted from Creswell (2002) and Thomas (2006)

Step1 (S1) involved organizing and preparing the data for analysis which includes the transcribing of the interviews, and the typing up of my field notes and sorting of my data into the two types, i.e. my notes, and my interview transcripts.

Step 2 (S2) I followed next with Step 2, in which I read through all my data again to give myself a general sense of what was said and what the data all meant overall, after which, I then proceeded with Step 3

In Step 3 (S3) I started a detailed analysis of the transcripts, by first coding them on the basis of key words in my research questions. This then allowed me to start organizing all of the information into segments of text which I labelled into named categories. To assist in this coding process, I adapted the steps described by Tesch (1990) as a guide for the process of coding my data i.e., I picked one transcript at a time and went through the content, carefully identifying key references to the research questions. After going through all of them, I made a list of all the references; then I grouped them into categories and named them, showing interrelationships where appropriate.

Step 4 (S4) Finally, I assembled the data for each resultant category in one place for a final analysis into themes.

Study Findings

Working through the final list of coded categories as described above, five major themes emerged from the data and they are shown in the following Table 5:

Table 5: Resultant Themes

THEME 1	THEME 2	THEME 3	THEME 4	THEME 5
Policy Activity	Interventions Activity	Challenges Hindrances/ Obstacles	Impact Perspectives	Perceptions: Suggestions and Wish-Lists
(a) Regional and International Drivers (b) MOH Primary Healthcare Activity	(a) Screening (b) Parents (c) School activity (d) Health Center activity	(a) Ratio of Work force to schools (b) Absence of Feedback data (c) Finance	Environmental Issues: – Culture; Advertising /Food Packaging	(a) Screening frequency (b) Data collection and distribution

THEME 1: Policy Activity

This research study investigates the policy context that informed actions and activities regarding childhood obesity prevention in Trinidad and Tobago, and finds that the initial drivers for Childhood Obesity Policies in the country have been activity triggered at Regional and International Health organizations where the Republic of Trinidad and Tobago holds membership, i.e., the World Health Organization (WHO), the Pan American Health Organization (PAHO), and Caribbean Public Health Association (CARPHA). The childhood obesity policy story could be picked up from the 2007 regional meeting publication of a document known as the Port-of-Spain Declaration. This was a key framing document for policy direction informing some of the critical steps that Trinidad and Tobago would take, not only for childhood obesity, but for Non-Communicable Diseases (NCDs) in general in the country.

> That's when we had the declaration of Port-of-Spain. And that was an important framing of a policy document that directed some of the critical action steps that we would take in terms of promoting the health of children. Reducing the NCDs of; not only obesity, but NCDs and as one of the risk factors the development of NCDs- obesity. And that would have spoken to it along the life course but with specific references to children, so that would be one of the frame pieces (Interviewee 1).

At the time of this Port of Spain Declaration, there was also the international World Health Organisation (WHO) *Strategy on Diet Physical Activity and Health,* which the government of Trinidad and Tobago adopted and these guided the development of interventions that addressed the whole issue of obesity and obesity in children. Also, in 2011 there was the international United Nations (UN) *Political direction re NCD* which contained a substantial number of policy directions, and that document was also adopted by the government of Trinidad and Tobago. Then regionally, there is the Pan American Health Organisation (PAHO), and more recently, the Caribbean Public Health

Association (**CARPHA**) who have developed policies regarding reducing childhood obesity, e.g., their “Global and Regional Commitments and accountability frameworks” and their “Key Policy areas to do with Taxation, Marketing, Labelling and Settings” which we have adopted as we are members of these bodies.

> We had both PAHO and more recently CARPHA develop policies on reducing childhood obesity and because we are one of the PAHO member states and we’re also part of CARICOM we adopted that. So those would be at the international level and also at the regional level (Interviewee 1).

And finally, regionally, the Caribbean Community (CARICOM), in 2012 had the CARICOM NCD strategic plan which identified 5 priority areas and a number of strategic actions under these priority areas, one of which dealt with obesity in children, and Trinidad and Tobago adopted the plan. With the influence of all those mentioned policies, Trinidad and Tobago Ministry of Health went to work on adaptation and development processes, resulting in our production of our “Draft Childhood Obesity Prevention Policy”, and our “Nutrition Standards for Food Sold to Children Policy”:

> Oh … last year we developed the standards for food offered to children in schools, which is a document I can’t give to you because it went to cabinet and actually made it into cabinet and has not yet emerged. So until it emerges from cabinet it remains embargoed, but, we have done that (Interviewee 1)

So it is also important to note that although a number of those policies have been developed and went all the way through National consultation, at the time of this interview, several have not yet had final approval by cabinet, so they have remained Ministry of Health policies. Two such are *The National School Health policy* and *The Childhood Obesity Prevention Policy* pieces which have remained in draft, and are being used as administrative practices.

> From a national perspective though, there are a number of policies that were developed that weren’t approved; as a critical piece for you to note. They were developed all the way to having national consultation, being sent/prepared to go

> to cabinet, but for one reason or another they didn't get the final approval. So they were Ministry of Health policy as opposed to National policy which when it is approved by cabinet is implemented across the board (Interviewee 1)

So the policy environment of Trinidad and Tobago with respect to Childhood Obesity is one of constant flux – review, updating, and modification, as it looks at the data emerging from International, Regional, and National research and developments. But, Trinidad and Tobago does have a reservation with respect to one aspect of Childhood Obesity Policy emerging from the international community. "There was the WHO/UN declaration to the meeting in Geneva where we decided on what the targets would be, and WHO's target between 2012-2025 was 0% increase in obesity!

> We had to stand down in making definite pronouncement on that. But we will collect data in April, May and June. And we'll get a national picture to see what's happening. And that will inform us if what we are doing has had a drop in the bucket effect or no effect at all (Interviewee1)

> By 0% increase they meant that you have to slow down the rise, and then you have to stop it, before you could put it into reversal. The kind of actions that need to be taken for that population-based effect has to do in some cases with legislation, taxation, policy and all these things and these things take time (Interviewee1)

Ministry of Health (MOH) Primary Healthcare Policy Perspectives: Against this Regional and International background, the issue of Childhood Obesity as a priority program area in Trinidad and Tobago began in 2008 when local research into the issue started, and by 2011 the MOH had the data in terms of the local characteristics of the problem, i.e., The World Health Organisation (WHO): BMI survey quantifying the data, which sections of population are being affected, the characteristics of the background of persons affected, all of which led to awareness of the scope of the problem.

> When we got the data and we analyzed the data we could see that over a ten-year period from 1999 to 2009 from 2000-2010 that period there you had almost a 500% increase in obesity in children in the age groups 5-18. We recognized that we don't just need programs and interventions, you need policies, and you need a

> whole new government approach, government civil society approach to addressing it. You need to look at the healthy public policies, reorienting health services, you need to look at building skills of children, and you need to look at all of that. You need to look at creating supportive environments… so based on that we drafted a childhood obesity prevention policy (Interviewee1)

As a result, the Ministry of Health held a national symposium in 2011, looking specifically at childhood obesity, which, by 2012, led to heightened awareness of the need for a national approach in addressing the problem i.e., a national policy with an emphasis on primary health.

Accordingly, there followed activity (a) to repeat the BMI survey (completed in 2017); (b) to conduct evaluations and screenings which include 24-hour recall sessions for insight into behavior impact after interventions; and, (c) to engage in a series of interventions, all of which were in line with the conceptual frameworks mentioned earlier in chapter 1, i.e., using a mixture of authoritative and negotiated modes to both persuade and counsel as per Beattie's, 1991 Conceptual Framework, and at the same time acknowledging the changes in food systems identified by Kennedy, Nantel and Shetty, 2004, quoted in chapter 2.

THEME 2: Interventions

A comprehensive list of the "series of interventions" mentioned in the paragraph above would include:

1. *BMI Screening* - District Health Visitors confirmed that, according to their job descriptions, they are required to go to the primary schools with a team, and, among other things, they do the BMI measurements on children, age6, in class1 at Primary School entry, and subsequently on children in class 4 or 5, just before the children leave for secondary school:

> Well the only policy I could think about; I don't have them at my fingertips, and we mandated, the ministry of health mandates the district health visitor to do an assessment/health screening on all the entrants and leavers. The health screening will include overweight and underweight. We have a tool that we use here and it will list whatever problems the child is experiencing medically, the parent or the caregiver will fill it out and we do their weight and height and look at nutrition. And in the complete assessment we do the weight and the height and now we have the tools from PAHO, we use the zydeco to determine whether the child is overweight or underweight and that is the only policy in terms of children and childhood obesity from the school setting, from the primary school setting that I could think about right now (Interviewee3)

If data collected in the screening indicate cause for concern, the children concerned and their parents are appropriately educated and/or referred if necessary to the Medical Officer and Dietician.

2. *Community Assessment Units:* This is an initiative which was first developed in an Urban Health Center. The Medical officer, a Paediatrician, head of the Center, recognized that in many cases children had to be referred to the general hospital where they had to compete with adults for treatment. The officer considered that if the Health Center were to have a unit that is staffed with a paediatrician, most of the referrals to the hospital would no longer be necessary. That idea gave birth to specialist paediatric clinics described as "Community Assessment Units (CAU)" being introduced in Health Centers in 2014. So far two Urban Health Centers have developed such units. The CAU clinic screens all children for their BMI and their weight-related habits. Those who would benefit are included in the Healthy Lifestyle Clinic operated by the Center. In addition, other children can be referred to the clinic by other doctors and school nurses and the services are free to patients. This process is intentionally made as easy as possible to decrease the burden on families.

This lifestyle clinic which is offered twice per week sees patients every 3 months. It has a multidisciplinary staff including a doctor, Health Visitor, nurses, dietitians. It focuses on family-based "Beattie" interventions helping children and their family members make small changes such as reducing sugar sweetened beverage intake or decreasing screen time and addressing resistance by emphasizing positive messaging and providing medical information to help increase parents understanding of their child's condition. They have very few "no-shows" and their attrition rate is low as they communicate with families in between visits to ensure that they attend their scheduled visits and they build rapport with patients from the first visit and build a positive partnership with them.

3. *The "Healthy Me" Caravan Program*: This intervention is an initiative which has been in operation since 2014, which involves having a School Health Caravan in operation, with resources like the Healthy lifestyle Nutrition quiz; a Children's Reader; Health Lectures; and A Health Fair. This mobile unit goes from school to school by arrangement all year round.

4. *The "Healthy Me" Health Camps:* Childhood obesity "Healthy Me" camps have been implemented with a program designed to teach children healthy lifestyle skills, and thus empower them to work towards achieving health targets. The program has three main strands which are "Healthy Me", "Active Me", and "Loving Me". Children who are assessed as over-weight or obese are offered places in these camps, which are offered in community settings to facilitate uptake by the targeted children and their parents. For instance, the Urban CAU

offers one of these camps annually for identified children to attend. In this camp, meals are provided, the costs of which were covered by the Ministry of Health.

5. *Healthy Transformation of Snacks and School meals:*

   The program agenda for the Health Fairs conducted as part of what the Schools Caravan offers to the student community, contains items focussed on transforming "snacking" and School meals.

> This is an idea of what we would do, this is the health fair. So you see we have all of the drinks and they would have the amount of sugar in each. So that's that. We also teach them how to make healthy snacks, simple healthy snacks. So this is a trail mix where the children are learning to do it or they may fruit kebabs or chow. So we try to introduce healthy snacking to them in a practical way.
>
> This is; as you see here, we're doing the lungs and so they're learning about it. This is the oral health going on here. That's oral health too. This is part of the physical activities. Every time we go we do survey
>
> There is the School Health Education Piece which is the School Health caravan that is designed after health promoting school model and it is also guided by the recommendations out of the safety FDMI evaluation of school meals, so they made specific recommendations and one of those was 'Nutrition Education and Healthy Lifestyle Education' within the school context. So that was designed based on that recommendation and from the outcomes of the survey; where we identified
>
> 1. What were the behaviors; and,
> 2. What were the issues; and, where we saw a preponderance of fried foods, salty snacks, and sugary drinks.

THEME 3: Challenges and Perceptions Thereof

Hindrances/Obstacles:

1. *Finance and Space*: In operating some of the interventions, e.g., the "Healthy Me" camps, the space available and affordable to conduct the operation in always not enough to meet the demand. So the camp session is unable to accommodate all the children who would like to attend and benefit from the program. Apart from the space

issue there is the inescapable problem of limited available finance to operate a camp. Thus space and finance are the two main factors reportedly limiting or moderating the impact of some of the efforts made to combat the childhood Obesity problem in the country. Indeed, the inability even to obtain sponsorships is seen as a significant problem, as the comment from an urban Health practitioner indicated, "The programs that I do – Weight loss, behavior change, *the barriers are only financial*", and, when prompted as to whether there was anything else now desired to be done that was unable to be done, the reply was "I would like to have the support of the Cafeteria. The Principal was supportive but the cafeteria is not under his complete control".

2. *Health Department's Focus*: There is also the perception that the Health Promotion Department has an apparent tendency to focus more on workplace values than on schools and school children's eating/behaviour practices. As a result, there is a challenge here to enable them to increase their efforts to combat childhood obesity

3. *General Focus:* In general, efforts to reduce childhood obesity prevalence appear to be mainly directed to the behavior of the student. There is therefore a challenge to extend the focus from concentrating primarily on the individual, to being more on the socio-economic, cultural, and environmental factors that are contextually involved in the problem, i.e., to move beyond the biology and behavior centered approaches, and increase action to modify environmental elements.

THEME 4: IMPACT Perspectives

1. The outcomes of the clinics have not been systematically evaluated but are believed to be very positive as most referred children decreased their BMI.

2. The camps also have had very promising outcomes with most children wanting to return once their session is over. Feedback from parents and children indicate that the camp increased their motivation to lose weight and they were uniformly excited about participation.

Actually, one practitioner admitted to sometimes being amazed by the results that are seen, and stated:

> We also do the once-a-year camp and to be honest the kids who get to go to camp are the ones you see results fastest in. Maybe is because of the amount of exposure they've had at camp, but I started noticing it because what I say to the camp kid is, "Everybody always wants to come back to camp every year, when they go one year they want to come back the next year, but you have to give everybody a chance. What I do is I hold two spots in camp for the people who made the most progress from the camp the year before. And you find that I may walk in and there's a kid who's been to camp and they go, "Doctor Sam look!" They've dropped whatever weight. And when you see the camp kids, its been amazing when I see them. When I look at them they actually look different. Changes that you can actually visibly see, that they've dropped weight. So they're competition for the two spots is what's driving the camp kids.

3. When children have been referred and treated, data was sometimes collected, but the practitioners at the operational level were not always made aware of the cumulative results of their interventions.

4. Also, primary school children being seen routinely only at entry and exit of the primary school, has led to recommendations for at least three routine checks instead of two in the Primary school.

5. The impact of the efforts of the current workforce engaged in Childhood Obesity Prevention is significantly limited as the Human resources employed to deal with this matter are too meagre to really make significantly greater impact. For instance, one practitioner reportedly has the task to cover 10 schools, comprising of a total student body of 3000 children!

THEME 5: Perceptions /Suggestions/ Interviewees" Wish-List"

There are a number of policy interventions that are perceived as desirable in that they are considered likely to contribute significantly to decreasing the prevalence of childhood obesity. These include:

1. Ensuring that PE is part of the curriculum, regulating the types of vendors that can be near schools and the distance they need to be from the schools; and,

2. Having regulations about the type of foods that can be served as part of the school feeding program. For this, due to privatization, there appears little uniformity about what is served and there is not much monitoring or enforcement of standards.

3. The policy requirement for screening in the Primary schools is only on entry and on exit. The expressed wish is for there to be one more screening point in the Primary school.

Research Questions Findings

Question 1: What obesity prevention and treatment policy interventions are currently available for school-aged children 6-11 years old in T&T?

Answer: Specifically, the data reveal that the policy interventions that are currently available for school-aged children, 6-11 years old in Trinidad and Tobago are as follows:

1. BMI screening at entrance to Primary school age 5-6; and again near time to leave Primary school at age 9-11.

> When a child came in to primary school at age six, Health practitioners did developmental screening on the children; BMI, height, weight, and they checked that their physical development was in accordance with their age, and, also psychological testing was done on them. These were done with parents present and If there were any problems, they would talk to the parents. And that was that.(Interviewee4)

Also, between those times, Health Practitioners would go to the schools if the Heads of the schools want them to give a talk on healthy living. And they would deliver those talks.

2. The next intervention available to these students is that of “Healthy Me” camps. These are annual 1 week residential “camp” to which children who were overweight or obese, were invited to attend. i.e., they were specifically obesity camps, to which only children who were referred by a doctor, could attend with a parent. There, they were guided to engage into the 3-strand program activities, Healthy-Me, Active-Me, and Loving-Me, all of which involve activities designed to address the overweight problem

3. The third intervention available to Primary School children is the “Schools Caravans” service. These caravans went from school to school with a program of teaching and lecture giving and demonstrations on healthy lifestyle. In so doing, filling the gap between the initial and final Primary Care school screenings, there would now be the operation of camps and caravans, with their unique programs, available to children with the overweight or obese problem.

4. The fourth intervention available to the specified children is the option to be registered in an obesity prevention program in the nearest available “Community Assessment Unit (CAU). There they would have the benefit of being registered in a Unit that is staffed with a Pediatrician and where there is a Lifestyle clinic in operation.

5. Government policy regarding School meals.

So by these five policy inspired interventions, children who develop obesity or overweight problems would not only be detected, but would also be taught several ways

to overcome the problem. The referral could also be done by a social worker, or a counsellor as these children could be having behavioral problems in the school. Indeed, a spin-off of obesity is often behavioral problems. So the interventions offer a multi-faceted approach to treatment.

In summary therefore, the role of policy in dealing with the problem is that the policy element is "upstream" activity ensuring that Trinidad and Tobago with its membership in PAHO, WHO, and Caribbean bodies, actively engages in obesity related international and regional studies, and our government executive representatives, coming out of those activities, locally manage a process of developing and managing Government action in Trinidad and Tobago that is consequently informed and influenced by international and regional data, strategies and procedures. In the specific case of Childhood obesity, local research action having been carried out, resulted in Job descriptions of our Primary Health Care Workers being influenced, and as a consequence, there ensued the generating of the initiatives described above.

Question 2: What perceptions and challenges are experienced by implementers and parents of overweight or obese children?

Answer: In the implementation of the policy stimulated interventions in Trinidad and Tobago, the main challenges experienced by parents and implementers had to do with:

1. Parents being able to get a place for their children who needed the intervention, especially in the camps, which were the intervention that appeared to achieve the greatest level of success with the students who needed the help.

2. The other challenge expressed by implementers was in getting all school cafeterias to provide only healthy items.

3. The perception by implementers that summary feedback information regarding students who have been referred would be helpful in determining the usefulness or otherwise of the process and would aid in generating efforts to maximize its usefulness.

Question 3: How do policy makers and Health practitioners perceive their current impact on childhood obesity trends in Trinidad and Tobago

Answer: In the data collected in this study, there is no expressed unified policy makers and Health Practitioners current perceived impact on Childhood Obesity trends in Trinidad and Tobago. The different interventions have varying degrees of success with the affected students in the age range studied, with the camps registering the biggest positive impact.

Further study would need to be specifically designed and executed to produce data on obesity trends in this country.

CHAPTER 5

DISCUSSION OF FINDINGS

Introduction

At the start of this research project, I indicated that by the year 2010 it was already noted that efforts to prevent childhood obesity were showing disappointing results, and, it was also being realized that public policy needed to be modified to address the limitations in treatment outcomes in children who were already in the obese category. The conclusion therefore was that *prevention* remained the best option to reverse the problem. That awareness introduced the opportunity for government to be a key player in "organizing policies and strategies that support healthy lifestyles among individuals in the community" (Chap 1, p2), and accordingly, the Purpose Statement for this study is:

> To obtain and explore the views of policy makers, health practitioners (doctors, health visitors, school nurses, dieticians) and parents of overweight or obese children, with respect to efforts currently being made to treat the rising prevalence of childhood obesity among 6-12 year-old children living in two of the Regional Health Authorities in the Republic of Trinidad and Tobago, i.e., one rural and one urban. (Chap 1, p4)

This stated exploration of views has now been conducted. From our data collection and analysis themes were identified and these will now form the starting point of this discussion. This chapter will therefore proceed to review, to analyze and discuss those findings, as expressed in the 5 themes described in Chapter 4.

Also, woven into the review, will be an exploration of the interventions (1) using Beattie's Health Promotion Conceptual Model as indicated and described in Chapter 1;

and, when appropriate, (2) using Kennedy, Nantel and Shetty's Globalization Conceptual Framework as described earlier in Chapter 2. Furthermore, the role and importance of leadership principles will be addressed as it relates to impacting the problem of childhood obesity in Trinidad and Tobago.

Discussion of Findings

THEME 1: Policy Development Activity

According to Kilpatrick (2000, p.1.) preventive public policy may be defined as "a system of laws, regulatory measures, courses of action and funding priorities concerning a given topic promulgated by a governmental entity or its representatives". Accordingly, one role of policy in dealing with the problem of childhood obesity is to be an "upstream" activity ensuring that the Republic of Trinidad and Tobago actively engages in evidence-based obesity initiatives. Membership in international organizations such as PAHO, WHO, and CARPHA, provides leaders with access to up-to-date studies being conducted in the region and allows them to align and adapt their policies with international recommendations. This highlights the importance of leadership and commitment from the top of an organization in efforts to impact a problem. The weight of international and national leaders making obesity a priority provides inertia to bring about change.

Government representatives are well positioned to translate the guidelines from these organizations into locally relevant policies and to manage the process of developing and implementing programs in Trinidad and Tobago. Consequently, the actions taken would be informed and influenced by international and regional data, strategies and procedures. One example is data reported by Rambaran et al (2018) "All 10 Caribbean

territories had a high prevalence of overweight (28.0 – 44.5%) and obesity (14.3 – 19.8 %) … Trinidad and Tobago ranked fifth, but in this territory the combined percentage of overweight and obese schoolchildren has been steadily increasing from 12% in 2001 to 51.5% in 2018."

Hence, the prominence of childhood obesity in the international and regional arena along with the high prevalence of childhood obesity in Trinidad and Tobago, added urgency to governmental involvement in addressing the issue. While there was much support for work in this area as evidenced by the national symposium and developments in the MOH strategic plan, there was also an acknowledgement of the difficulties of achieving the initial recommended goal from the UN/WHO. Though not able to foresee a zero percent increase in obesity prevalence, the Ministry of Health 2017-2021 Strategic Plan, still set the ambitious goal of a commitment to a 15% reduction in child overweight/obesity in the five-year period of the plan, and the preventative public health-care policies perspective is also present in the examples of relevant policies listed in the plan and referred to by participants, namely, "The School Health Policy", and, the "Draft Childhood Obesity Prevention Policy". These policies enhanced the impetus for improvements in obesity interventions. However, they have yet to be fully implemented and have experienced some delays in their journey through parliament.

THEME 2: Interventions

This study highlighted the importance of a number of public health policy-generated interventions. In the execution of the above policies, the Ministry of Health focused on the work of primary care physicians and allied health personnel, specifically health visitors and dieticians. They revised the job descriptions of these healthcare

providers to include detailed requirements related to addressing childhood obesity. Regarding prevention, BMI screening was the most frequently mentioned intervention required of pediatric providers. This first step in the prevention of childhood obesity has been shown to be effective in studies across the pediatric age spectrum as previous studies have shown that providers often do not diagnose children with excess weight effectively just by visual inspection. Health visitors embraced this an important part of their job and as a key approach to delivering appropriate services to those children with the greatest need. Of note, growth assessment is a well-established part of the public health portfolio. Whereas, historically undernutrition was the most prevalent concern, now excess weight is much more common and health visitors are well equipped to identify those children who might benefit from additional services.

There was the development of initiatives and policy interventions that are currently available for school-aged children 6–11-year-old, in Trinidad and Tobago, as mentioned in Chapter 4. i.e.,

- BMI screening, with parents involved, at age 5-6 years old, on entrance to Primary school; and again near the time to leave primary school at 9-11 years of age.
- Ad hoc health lectures during the school years.
- Annual "Healthy Me" obesity camps.
- A "Schools Caravan" service.
- One Pediatrician staffed a "Community Assessment Unit (CAU)" whose services include lifestyle clinics; and,
- The Healthy School Meals Plan.

Using Beattie's Model to analyze these interventions, we check first in terms of Beattie's vertical spectrum. This clearly shows that in the *development* of these policy-generated activities, the "mode of thought" used in their development and delivery, is not negotiation with the students. Instead, the mode is an authoritative mode, "Top-down", and "expert-led". This feature can be regarded as a good characteristic as such activities

can consequently be considered to be properly informed by evidence. However, there is a growing understanding that successful leadership, particularly as it relates to public health, requires the input of a range of stakeholders. When thinking about childhood obesity, this might include those who make the meals served in schools or those vendors who are located near schools. Incorporating the ideas of interested parties who are often not in positions of power and gaining their buy in may well improve the likelihood of successful outcomes of new interventions. Furthermore, in the *application* of these activities or interventions, when they are analyzed in the light of Beattie's horizontal spectrum, their focus is seen to be largely on the *individual* and not on the *community*, or on the *environment*, or on the *public* or *society* at large. Literature that comments on the effectiveness of interventions of this type indicate that the policy emphasis needed to be extended beyond the individual, and individual behaviors, and should address changes in the environment and in the community, in order to achieve the desired success against childhood obesity prevalence.

Next, applying the diagram in Appendix A to our identified interventions, introduces another related point of interest. The diagram and its related information was produced by the CDC in the USA to provide a way by which policies for obesity prevalence may be evaluated. In its application to the problem in the USA, the following remark that was made, can be seen to be particularly relevant to this discussion regarding our study:

> We present a framework developed by the CDC-funded Center of Excellence for Training and Research Translation that public health practitioners can use to evaluate policy interventions and identify the practice-based evidence needed to fill the gaps in effective policy approaches to obesity prevention. The prevalence of obesity in the United States has led to increased investment in obesity prevention and a growing focus on interventions that extend beyond individual

> behaviors to also address changes in environments and policies (1,2). Individual-level interventions are resource-intensive and have limited potential for lasting success as long as environments promote unhealthy behaviors and limit access to healthy foods and safe opportunities for physical activity (3,4).(See Appendix A)

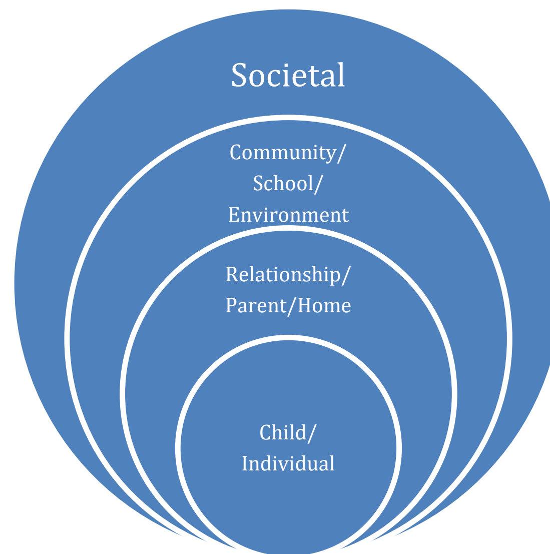
This therefore suggests that in Trinidad and Tobago, there may be need for consideration to be given to further development of policy-driven and other activities or interventions, but these developments now must be "community" and "environment" focused, to increase the impact with respect to solving the childhood obesity prevalence problem. In this regard, aspects of the role of leadership in the USA's "National Campaign to prevent Teen Pregnancy" (Leonard, et. al.) could provide ideas for our situation., e.g., stimulating a National Dialogue/discussion on the problem involving the community and society at large.

Next, with regard to the current individual-level interventions, as the child's first "environment" is the parents, and the first "community" is the home, an adaptation of the social ecological model as shown below would support the following suggestion.

This model suggests for example, interventions might incorporate efforts that encourage parents t to embrace and practice health consciousness in the home by engaging in one of the many available popular programs, e.g., "NEW START". Based on the writings of Ellen White, NEWSTART which is an acronym for Nutrition, Exercise, Water, Sunshine, Temperance, Air, Rest and Trust in God, is a physician monitored, scientifically researched lifestyle change program which has been shown to be effective in addressing excess weight in children (Ramirez et al., 2016). If parents accept that each of these eight elements plays a significant part in their child's ability to maintain good health, then their health conscious activities in the home would make a vital contribution

to the child's receptiveness to the health messages given at school, and, in the choices the child would make at critical moments.

Figure 6: Social Ecological Model Adaptation



In addition, considering that an obesogenic environment is an environment that promotes and supports obesity in individuals or populations through physical, economic, legislative and sociocultural factors, it would seem that with regard to the "further policy-driven action" mentioned above, a "first step" could be focusing on making the "physical environment" and the "community" less obesogenic. And this could be done by increasing the availability of (a) well-lit playgrounds for children, (b) safe cycle paths and walk-ways for home to school journeys.

By using the social ecological model, the CDC evaluation tool, and the Beattie analysis diagram therefore, it has been possible to look comprehensively at the

interventions and their application, and to identify "gaps in effective policy approaches" and accordingly, to discuss ways and means to achieve overall greater potential effectiveness, between the existing health interventions and the prevalence of childhood obesity.

Theme 3: *Challenges/ Hindrances/ Obstacles*

In the implementation in Trinidad and Tobago, of the policy-stimulated interventions described above, this study revealed some challenges and limiting factors experienced by implementers and parents of children with excess weight. A very significant one appears to be in the matter of screening.

1. Screening: The screening by health visitors while useful at identifying children at greatest risk is limited by the fact that it only occurs at age 5/6 years old and 11/12 years of age (at the start and end of primary education). While these ages maybe key periods for the development of excess weight, there is a gap during which excess weight may accrue without being identified by the health care system. This long period between is seen by most practitioners to be too long, and, that another screening should be made at about age 8.

An attempt to address this gap has been the development of Community Assessment Units at Health Centers. However, their availability is limited, and the costs associated with them present a hurdle. Policies that provide funding for such programs could make a difference in the prevalence of obesity, particularly in the rural areas where children do not currently have access to such specialty care.

A further challenge is that when a child has to be referred, a significant element in carrying out the necessary intervention depends on the child's parent being persuaded to

diligently engage in changes, especially regarding food, as advised by the health practitioners. As one practitioner said:

> My hope was that we would be able to persuade parents, where they're taking wrong education health methods…. Some parents buy in, as I told you, but it's a culture change that has many dimensions and I think that unhealthy food is too easy to get. Eating the healthy way is the more difficult way to eat because the cheaper foods are the unhealthy foods and children gravitate to those, because they eat for taste. (Interviewee2)

The issue here is the challenge to get children to reject the elements in their obesogenic environment and choose alternatives advised by the health practitioners, alternatives which are usually more expensive and less taste-attractive. The real challenge is to find innovative or creative ways to eradicate that competition. Many who have implemented programs such as the NEWSTART program have incorporated cooking classes into their interventions particularly when working with children (Sallinen et al., 2013). By offering taste testing of healthy versions of popular foods (such as brownies made with black beans rather than chocolate), children have been encouraged to swap out less healthy options. Furthermore, utilizing motivational interviewing techniques that link the benefits of healthy eating to things children value (i.e., excelling in sports) is another approach that has shown promise when helping families adopted healthy eating habits (Resnicow et al., 2015).

2. Classroom lessons/lectures/sessions: Between the screening at age 6, and 10, there are ad hoc classroom health presentations made by health practitioners to the students. These take place when and if the head of the school so desires. It would seem that for some, a challenge exists in getting a standard curriculum to be specially designed and implemented for those primary school years.

3. The Schools Caravans: When it comes to implementing the intervention of the schools Caravans, the challenge has to do with the availability of employed health practitioners and caravans available compared with the number of schools to be served. The following comment illustrates:

> We go from school to school to school and we haven't even reached 100% of the schools as yet, we're probably just over 10-20% of schools. So we go to the schools and we do education first. So we have a number of components that we deliver to the children using a more educational approach. Then alongside that, we use more workshop types of activity, like things in the School Health Fair which is done the same day, where we now give a little bit more hands-on experience. (Interviewee 1)

So in terms of the Caravans therefore, their program's ability to provide needed help and practical health education seems clear, but what is a problem is that there is not enough of them to be scheduled in a meaningful way to reach the school population, as in the entire County, served by that Health Center, there are 44 schools, and therefore not enough "man-hours" currently focusing on the problem to achieve the desired effect.

4. Obesity Camps: A similar limiting factor, as that experienced with the caravans, i.e., scarcity of resources, exists also in the case of the Obesity Camps. In this case there is very limited number of children who can be accommodated in any period of a camp in session. This lack of availability of places is regrettable, as this is the intervention that appears to achieve the greatest level of success with students who need the help. For parents to be able to get a place for their children who need this intervention, they have to face the fact that the camps are annual 1 week "camps" to which only children who are overweight or obese, could attend, only if they were referred by a doctor, and if they could attend with a parent. At the camp, they would be guided to engage into the 3-strand program of activities, Healthy-Me, Active-Me, and Loving-Me. All of which involve activities specially designed to address the overweight problem.

The reason why more sessions of the camps are not organized is the lack of finance to engage appropriate personnel to conduct the required activities. This challenge is one that may be addressed if the funding source is able to reorganize to prioritize this need.

> Funding is a major issue. Funding and physical space are the issues that the CAU is dealing with. As you can see we have a very small space. And the one in ST. James is even smaller, so whereas we my like to have them all in on the same day we do not have the physical space for that. That is why we have to split them up, and funding is a major issue, for example, camp this year; with the recession and the RHA reducing their budget and all of that I've been trying to think of a way without it costing the RHA anything. And I don't know, it'll be quite a battle. (Interviewee5)

5. School Meals: Another challenge expressed by implementers was in getting all school cafeterias to provide only healthy foods. The need for this is well illustrated by the following practitioner's comment:

> I asked each of them "So what did you have for breakfast this morning?" So one said saltfish and bake I asked a next one and a next one until let's say the twelfth time I had saltfish and bake and eventually that I realize either this is very popular dish among the children in the school apparently the school feed them, yes in the morning. So apparently most of the children in that five-year old group that have twelve or fifteen for the most, most of them access school feeding. (Interviewee 7)

This observation that a significant number of children access "school feeding", places a responsibility on the school to supply appropriate healthy options for the children in question, whilst always seeking to accommodate, to some extent, the cultural dimension of this issue.

The school feeding program have a policy on that as to what they were allowed to feed the kids, but they've abolished that, so now I don't think anybody has control over what the cafeterias serve per say.

Interviewer: Are they done privately?

Interviewee: All the school cafeterias are privately run and nobody has any real control over them.

Theme 4 & 5: IMPACT Perspectives & Perceptions /Suggestions/ Interviewees" Wish-List"

Finally, there is the matter of participants' perception and perspectives of current impact on childhood obesity trends in Trinidad and Tobago, and their current "Wish-List**".** In the data collected in this study, there is no expressed unified current perceived impact on Childhood Obesity trends in Trinidad and Tobago. The different interventions have limited and varying degrees of success with the affected students in the age range studied, with the camps registering the biggest positive impact. Indeed, one practitioner's perception is:

> Therefore, collecting and summarizing performance data from all the intervention activities, and looking at the whole matter in detail is yet to be done. Further study would need to be specifically designed and executed to produce data on the trends of this problem in this country.(Interviewee3)

On the other hand, with respect to particular individual interventions, e.g., the obesity camps, when a practitioner was asked, "In your judgement, this initiative has been very successful?" the response given was as follows:

> I think so, but when we start looking at it in detail we will see. This is just from my judgement from meeting the kids and seeing the number that we have with the BMIs going down, and because every time that one of my junior's sees a kid whose BMI has actually gone up, they come and tell me about it, and it doesn't happen that often.

In attempting to evaluate the impact of the interventions, it is significant to consider comments like the following from a practitioner; "*And I guess specifically for Trinidad and Tobago, which has been because of the oil we have been a wealthier country, the amount of people eating fast foods. They have greater disposable income to have richer foods etc*.". This leads us to regard as important and to take into account

whether the Kennedy, Nantel and Shetty's Globalization Conceptual Framework, as described in Chapter 2, has been a factor involved in affecting the impact of the intervention efforts made in Trinidad and Tobago.

Kennedy et al's comment on the phenomenon of globalization informs that globalization is "having a major impact on food systems around the world" (p.1), and that food systems are changing rapidly, and that "many of the changes are closely associated with *urbanization, increasing incomes, market liberalization and foreign direct investment*." (p. 1). As participants' comments have revealed that several of these four elements are present to various degrees in the country of Trinidad and Tobago, further studies should be done to establish the extent of their effect on impact on prevailing intervention efforts to combat the childhood obesity prevalence problem.

Finally, accepting that there will be of necessity some time-lag between policy measures and their impacts, and also, as most of our interventions rely upon educating individuals to change eating habits and choices, and, to maintain regular exercise, i.e., calories in versus calories out equation, it certainly would be very important to do impact studies with regards to the present interventions being supported by government policies. In doing this, it would be of significance to note the following statement made by the United States Preventive Services Task Force (USPSTF), and published on their web-site:

> The USPSTF recommends that clinicians screen for obesity in children ≥6 years of age and offer or refer to comprehensive, intensive behavioral interventions to promote improvements in weight status (B Recommendation) ….. A systematic review by the USPSTF concluded that comprehensive, intensive behavioral interventions (≥26 contact hours) in youth ≥6 years of age who have obesity can result in improvements in weight status for up to 12 months. ...(USPSTF)

If that figure of 26+ contact hours "intensive behavioral interventions" is what is required to achieve the reduction in childhood obesity prevalence, then there may be a case for policy intervention to increase (1) the presence of CAUs (Children Assessment Unit) with lifestyle clinics in more of our Health Centers; and (2) increasing the personnel and time spent in the current interventions.

The Health Centers as Cases

This calls for moving through the process of description, analysis and interpretation (Wolcott 1994) in which I would include my field notes woven into the research findings text. Further, in deciding how to present a case (Stake 1998) argues that "it is the researcher's dressing of the case own story (p 93). So in seeking to present the cases I have constructed a 'case' record (ref. Pation) or an overview of each of the cases from the interview data by first reviewing the initial coding of the interviews and re-reading the interview transcripts, looking for the themes which emerged and which provided the foundation for my "vignette".

Having done this, I then had to ask myself "Is the essence of the ideas captured as suggested by (Lincoln & Guba, 1985)?" And to determine the answer, I addressed their four criteria: i.e. (a) credibility, (b) transferability, (c) dependability, and (d) confirmability. To succeed in incorporating these characteristics, I ensured, according to Russell, Gregory, Ploeg, Dicenso, and Guyatt (2005) (as cited in Baxter, 2008, p.556), that: (a) the case study research question(s) is(are) clearly written, propositions if appropriate to the case study type, are provided, and the question is substantiated; (b) case study design is appropriate for the research question; (c) purposeful sampling strategies appropriate for case study have been applied; (d) data are collected and

managed systematically; and (e) The data are analyzed correctly. (Russell, Gregory, Ploeg, DiCenso, & Guyatt, 2005).

The Case of the Urban Health Center

My first visit was carried out in an Urban area in Trinidad and Tobago. The Health Center was located in a residential area which hosted many different health /offices/departments. The Center appeared new and well-organized. I was introduced to the Health Practitioner and met with her in her office. Having spoken to her before by telephone we reintroduced ourselves and chatted for a while before starting the interview. She was very welcoming. I felt very comfortable in her presence as we discussed about the purpose of the Health Center as most Public health medicine and prevention work is carried out by the Community Health Service and hence about the different departments they hosted at the Center. Confidentiality was then discussed and a consent form was signed and we started the interview.

My first questions were based around my research first question, which was to do with prevention around childhood obesity and policy which formed the foundation for the interventions which are being carried out. She was unable to recall any written policy which underpinned her practice, but she, having been an experienced Health Practitioner working in the area for more than five years during which her duties were outlined in her job description, and was therefore funded by the Regional Health Authority which is part of the Ministry of Health. These duties included the interventions of assessments of Health, immunization and developmental screening of children between the ages of 6 to 12 years of age on entering and leaving Primary school. Interventions will include BMI checks and nutrition assessments. Parents were given forms to fill out prior to these

assessments. A PAHO assessment tool and a Z-chart are used in carrying out these assessments. This illustrates the policy which underpins part of her duties.

One of the significant things here at this Health Center is that the worker is working in a Primary Health Care Team of which the worker is an integral part. The team comprises Health Practitioner, Medical officer, a Dietitian, a Dentist, a Social worker, and a Pediatrician. These services are all free and if there are any other health concerns, e.g., social concerns, parents and children are referred to the relevant specialist. Overweight and obese children must be referred to the Medical Officer of Health and to the Dietician. The Health Practitioner would like to make more frequent visits to the schools but because of the number of children in the seven schools, i.e., 3000+, it is impossible to do this unless students are referred by the School. It is desired to see them at least once between the ages specified however, defaulters are always followed up.

Parents' perceptions are not always the same as that of health professionals. Parents often do not see their children as overweight or obese. They would say they are just "big-boned" as their grand-parents, and that runs in the family, and as such it is sometimes difficult to get them to change their diet or behavior. Most parents are working and employed outside of the home and children are given money to buy snacks, which then is difficult to control. Vendors are discouraged from selling snacks outside of the school, and this is another factor in the fight to control obesity. Due to the under-staffing of the service, the impact of the service is difficult to assess. This Health Practitioner in question has to visit 7 schools with about 3000 students. The experience is therefore one of wishing to do more and to have data about results, but whatever was

available was kept at the RHA office. Funding comes from the Primary Health care budget, and the worker is part of that Sector/Area.

This interview took place in another Health Center situated in the busy part of the urban area, with lots of shops, food shops, small clothing shops, car mechanic shops, and other hardware and other small shops along the busy roads. The dietician was based in another Health Center building, well away from the Health practitioner in another health center where the Community Assessment Unit is placed. I was able to be shown around the Health Center and I felt that the location was quite isolated! One of the schools to be visited was actually exactly opposite to the Health Center. After indicating what my research was all about, and the consent form was signed, I began the interview. The practitioner explained about the role, and that like the other members of the team, funding was by the Primary Care Services budget of the Country. The dietician spent a lot of time giving talks in the schools about diet, about making healthy lifestyle choices in matters of food, food preparation, exercise, and in the care of the body. Students are referred to the dietician by the Health Practitioner and by teachers of the school and by the Community Assessment Unit. Although dietetics was based quite out here, it seemed well integrated in the Healthcare Team of the Center. Now the area is quite diverse culturally and social …economically. With regard to the age groups of parents, many are young and are working, some are homeowners, some are business owners. A busy area to live in and work. Parents do not see their children as having a weight problem, and would generally say they have a healthy appetite. Children in this area seem to have a lot of spending money to buy snacks and food around the area as the shops are very conveniently located around the area.

The Case of the Rural Health Center

The Health Center was situated in the town Center of the area with shops and stores, businesses and family homes. It was quite a busy area, and very different from the previously described Health Center. Having spoken to the HV prior to our meeting, i was expected. We met, and I was shown into a quiet area where we could conduct the interview. I gave her the information about the research and she signed the consent form and we began the interview. I followed the same format as previously done for the Urban interview.

Her experience was the same – no policy document but work was done from a job description. The same PAHO and Z charts were being used and engaged in Interventions as defined in the job description and some were carried out on the practitioner's own initiative. The children would be seen when they entered primary school at age 6, and then again when they left primary school. Mention was made of having a good relationship with the parents of the children of the school, and students were referred to the dietician by the school staff if there were any problems, and the same screenings were done as mentioned above. Funding for this service came from the Primary Care budget. If there are any problems, children are referred by the Health Practitioner, to the Medical Officer, or the dietician and to other members of a similar team, as done in the Urban area, except that this team is without a Pediatrician.

In this rural area, there is a service offered once a year in the summer, where children with a weight problem are invited to attend a residential summer camp. The camp is funded by the Ministry of Health, free to attendees and parents are encouraged to visit. A school was identified from which focus group parent participants could be

obtained, where, there were a large number of children aged 6 – 12 The Primary school is situated near to the beach in a very quiet area with homes dotted around the area.

The dietician is based in an administration building in a less busy area, more residential than where the Health Center is located. I was welcomed and after the initial introductions and information about my research, we began the interview. Funding for the service is by the RHA and the duties are outlined in the job description. The dietician sees students from a large area in the RHA, and also works from within a team which has a member who is a Health Education Officer and an added person in this team. There is also a dietetics role in the conducting of Healthy Eating Demonstrations in schools and Health Centers, working together with the Health Education Officer. This intervention has an effect on the kinds of snacks which are sold in the schools of the RHA. Children of all ages are referred to the dietician by the Health Practitioner. If they are found to have raised BMI and classified as obese and/or mal-nourished, the dietician would work with parents of these children giving demonstrations of foods and food preparation.

The dietician is also heavily involved in the childhood obesity residential camps which are one week long annual events. Children are shown how to prepare healthy foods, how to exercise with an exercise instructor, and how to make healthy choices. Unfortunately, attendees at these camps are not exclusively within the age group I am researching. They are mainly 8-13 years old and older teenagers. The impact of these camps is very significant. This is a signature event in the area and is supported and funded by the Ministry of Health. The practitioner would like to expand the health promoting / interventions/ activities, but that is not possible at the moment. Free transport is provided for the children. Another challenge is that of family traditions; e.g.,

“No cooking is to be done at home on Friday”. As a result, cooked food is bought, and it generally consists of “fast food”. The dietician has seen 50% compliance; There are other problem clinics being run, and children with other problems are seen every two weeks.

Leadership and Childhood Obesity

Earlier in this document, at the end of chapter 2, page 41, I wrote the following:

> Effective control of obesity requires a shift away from the traditional focus on physician clinical management only and should include a wider range of providers addressing a variety of environments, including those in which the weight-related behaviors occur. Vital to the success of this approach will be the participation of all health professionals, educators, legislators, business people, parents and those involved in Health Promotion. Leadership and advocacy from Health Professionals and Scientists is required to bring about these changes. (Chapter 2, p. 41)

The data that has emerged from this study would seem to confirm that statement, and support the perspective that strong informed leadership through supported policies would have the potential to play an important role in the prevention and treatment of childhood obesity. As indicated by Koby,(2009, p. 8), there is thus a need for foresight, vision and a long-term commitment/investment in infrastructure, programs and policies that are likely to reverse the epidemic. From the socioecological model it is clear that efforts are needed at all levels to foster healthy lifestyle habits. Those involved in the process of leadership are uniquely positioned to utilize evidence-based approaches, for example, to provide healthy nutrition in schools, design built environments that support outdoor activity, and make treatment programs accessible to children/families struggling with excess weight. For example, health education leaders can be particularly helpful in promoting and designing interventions to create safe environments that foster increased physical activity, especially as they incorporate community engagement in the process.

While the problem of childhood obesity is complex and multifaceted, there are also some important leadership steps that health professionals can take. Lovejoy (2011) suggests, 5 particularly salient needs that health professional leaders should address, (1) prenatal interventions, (2) effective health education programs, (3) ensuring family involvement, (4) gaining a thorough understanding of the costs of obesity, and (5) seeking partnerships with both the community and industry.

Beyond the abilities of healthcare professionals, governmental and regional level leadership is vital to be able to ensure widespread uptake of recommendations. These entities are able to utilize both carrots (such as funding) and sticks (such as fines) for adopting policies with the potential to effect positive change. Jacoby et al (2013) suggest that national governments and PAHO should in particular address surveillance of the problem and its impact, support prevention, and promote education (of policy makers and the public). In addition, they should effect policies to improve nutrition, physical activity and prevent marketing of unhealthy options to children, and should increase capacity within countries to address obesity particularly in providing the needed resources.

In this vein, an interesting quote in the New England Journal of Medicine, Bleich (2018) argues that the next step in prevention of chronic disease is a deliberate focus on population-level approaches that make the healthy choice the easy choice rather than relying on individuals to purposefully change their own behaviour. This is indeed the case for childhood obesity prevention. Population versus individual measures. One final point to make the case for such government policy action is the point made by Rambaran et al (2020) that, previously the Ministry of Health in Trinidad and Tobago had implemented the "Nutrition Standards for Food Sold to Children in Schools" and

observed a decrease in consumption of soft drinks between 2011 and 2017. There is therefore good reason to consider that enhanced government policy action as described earlier, is vital to win this battle.

Overall therefore, the study has revealed the need for much greater leadership activity focused on (i) using communications to raise public awareness; (ii) effecting change of local culture by influencing media content; (iii) harnessing and impacting parents values in their faith communities; (iv) using and producing research to inform strategy and practice; and (v) shaping public policy, or public funding priorities. These measures have been some of the fundamental means employed successfully by the US "National Campaign" (Leonard et al) in their creditable vision to impact their National problem of teenage pregnancy. In our Republic, appropriate adaptation and greater use of these measures have the potential to impact that childhood obesity problem.

Conclusion

In conclusion, it is important to indicate that the findings of this study must be considered within the context of certain limitations, however, future studies may wish to probe further into determining ways and means to counteract the financial and cultural factors that currently militate against childhood obesity prevalence reduction in Trinidad and Tobago.

Recommendations

In the light of the above, the significance and importance of this study can be expressed in terms of the benefits that would be derived from doing the study and I consider them to be as follows:

1. The provision of a research based foundation for making changes or adjustments to policies to enhance the country's efforts to deal with the problem.

2. The contribution to theory, through the development of a theoretical framework, based on the literature, for estimating the relationship between the relevant health policies and the prevalence of childhood obesity.

3. The consequent potential reduction of subsequent disease risk and perceived societal burden.

4. Resource Allocation: Having derived relevant data/ knowledge residing in the experience of practitioners in the field, it is the hope that these data can be used to contribute to more effective resource allocation than currently focused on treating with the problem.

5. Specific Research Recommendations.

(a) increase screening frequency, (b) increase the number of CAUs in the Republic, and (c) increase personnel involved in childhood obesity reduction and prevention efforts.

APPENDICES

APPENDIX A: Case Study Research Protocol

The purpose of my study is to obtain and explore the views of policy-makers, health practitioners (health visitors and school nurses), and parents of elementary school children, with respect to efforts currently being made to treat the rising prevalence of childhood obesity among 6-12 year-old children from two of the Regional Health Authorities of the Republic, i.e., one rural and one urban. This case study protocol has been developed giving consideration to matters of validity and potential bias, and, according to Yin (2012), ensuring that all elements of the case are analyzed and adequately described. For each of the two cases/sites that will be used, the research procedures will be replicated in similar fashion. In doing so, awareness will be maintained of Yin's caution that multiple cases have the potential to dilute the overall analysis.

Rationale: Due to the rising incidence of Childhood and Adolescent Obesity in Trinidad and Tobago, and the country's view of it as a major public health challenge, especially considering its impact on ensuing morbidity and mortality, it is clearly necessary and important to do this study in order to discover data/ knowledge residing in the experience of practitioners in the field, so that such data can be used to contribute to the effectiveness of the resources currently treating the problem.

Significance and Potential Benefits: The significance and importance of this study can be expressed in terms of benefits that would be derived from doing the study. They are: (a) the provision of a research based foundation for making changes or adjustments to enhance the country's efforts to deal with the problem, (b) the contribution to theory, through the development of a theoretical framework, based on the literature, for estimating the relationship between the relevant health policies and the prevalence of

childhood obesity, and (c) The consequent potential reduction of subsequent disease risk and perceived societal burden.

The Research Design: In the research design for this study, use will be made of qualitative methodology, employing a combination of policy review and case study research. The policy review would consist of an analysis of health policies and other health service documents relevant to addressing childhood obesity and combating its rise in Trinidad and Tobago. According to Stake, (as cited by Hyett, Kenny & Dickson-Swift, 2014, p. 166) "each case study is a concentrated, single inquiry, studied holistically in its own entirety" so case study researchers are urged for each case to identify what are the commonalities and particularities about the case in terms of its nature, e.g., its history, its location or setting, and its context (Stake 1998). Hence my chosen Health Centers were selected because they were both well established, one in a rural setting, the other urban located, and both providing service to schools and community representative of the diversity of the country of Trinidad and Tobago.

The Population/Sample: According to Creswell (2012) selecting people or sites who can best help us understand our phenomenon is called purposeful sampling. This strategy is used to develop a detailed understanding by eliciting useful information about the phenomenon. The purposeful sampling in this study has been done so as to develop two possible perspectives, hence my choice of sites is based on location, i.e., one rural, and one urban. In keeping with this, I have confined my study to only two cases; i.e., The El Socorro Health center in the urban district of St. George East, and, The Manzanilla Health Center in the rural district of St Andrew/St David.

The participants will be drawn from: (a) policy makers, who have been involved in the making of the relevant health policies, (b) health workers e.g. school nurses, District Health Visitors (DHV), and regional health managers, as the work of health promotion is mainly decentralized to the Regions, (c) Director of Health Education of Trinidad & Tobago who has the responsibility of policy implementation, (d) health center doctors and dieticians, (e) The Permanent Secretary, Ministry of Health, and (f) Parents of children served by the Health Center who form the focus groups. The participants who are politicians and government workers are all currently employed. The politicians would have been elected and employed for the last five years. All the interviews and focus groups will take place in the Health Centers.

Analysis of Data: In this study, being qualitative by design, the data analysis will have unique steps, moving from specific to general, and would involve multiple levels of analysis of the data. By means of inductive data analysis, patterns will be built up, and, categories and themes will emerge from the bottom up, by organizing the data into increasingly more abstract units of information. This inductive process facilitates working back and forth between the themes and the database until a comprehensive set of themes have been established (Creswell 2007). In analyzing the data I expect to be involved in going deeper and deeper into understanding the data, and interpreting its larger meaning. It is an ongoing process, continually reflecting about the data, asking analytic questions and writing memos throughout the study. The information gleaned can be used in the final report. During this process, significant statements will be analyzed, and there will be the generation of "meaning units" and an "essence description" as described by Moustakas (1994, p. 9).

Creswell's (2007) diagrammatic representation of the process suggests a linear approach, building from the bottom up, but he states that in practice, it can be interactive and interrelated. He suggests the following four steps to the data analysis process:

1. Organize and prepare the data for analysis which involves transcribing the interviews. Optically scan material, type up field notes sorting of the data into different types.

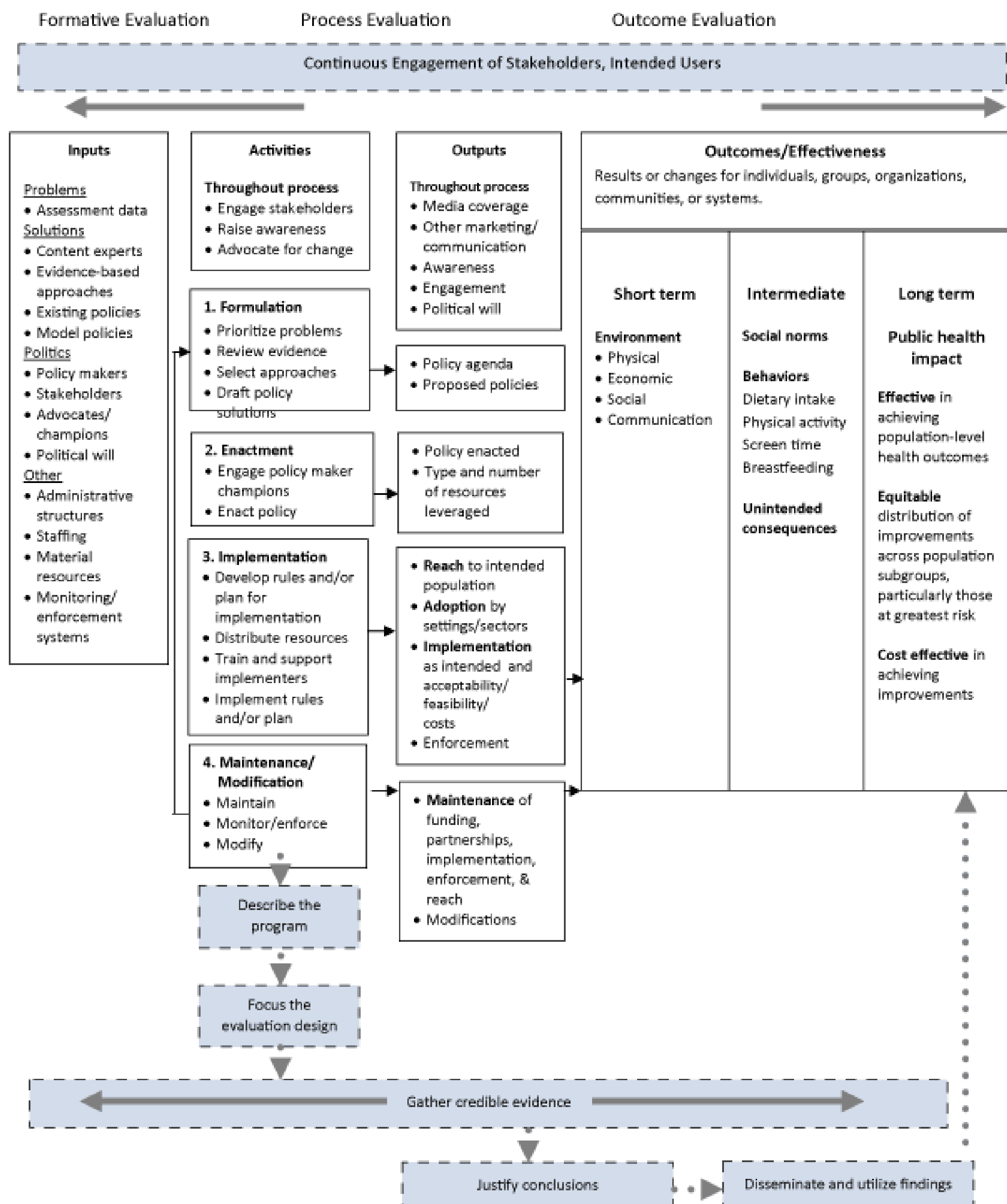
2. Read through all data obtaining a general sense of the information reflecting on all its meaning paying attention to tone, depth, credibility, and use of the information.

3. Start detailed analysis with a coding process. To assist in this coding process, I will use the 8 steps as described by (Tesch 1990) as a guide or systematic process in the coding of my data e.g., get a sense of the whole by reading all of the transcriptions; pick one document and go through it asking the questions what is this about; after going through several of these make a list of all the topics and the clusters; abbreviate the topics as codes, then put them next to the appropriate segments to see if new categories or codes emerge; group topics, name them but show interrelationships; make a final decision on the abbreviation of each category and alphabetize the codes; Assemble the data for each category in one place and do a preliminary analysis; then if necessary, recode the data.

4. The final step in the data analysis will be the interpretation or meaning of the data. Asking what are the lessons learned? Is the essence of the ideas captured as suggested by (Lincoln & Guba, 1985). Interpretation in qualitative research can take many forms and can be adapted from different designs and be flexible to convey personal research-based, and action meanings.

APPENDIX B: CDC Evaluation Framework for Obesity

Figure 2. Center TRT's evaluation framework incorporates elements from multiple policy-making and evaluation frameworks (9,15-19). The framework is intended to support practitioners as they develop logic



models to describe and evaluate policy making initiatives. Leeman J, Sommers J, Vu M, Jernigan J, Payne G, Thompson D, et al. An Evaluation Framework for Obesity Prevention Policy Interventions. Prev Chronic Dis 2012;9:110322. DOI: http://dx.doi.org/10.5888/pcd9.110322.

APPENDIX C: Field Note Observation Form (Creswell 2012 p. 216)

APPENDIX C: Observation Form

	OBSERVATION	REFLECTION

APPENDIX D: Interview Protocol

My interview Protocol is adapted from:
http://english.ecorys.nl/dmdocuments/final%20report%20201208.pdf.

Introduction**:** I shall introduce myself and thank the interviewee for agreeing to take part. Then I shall continue as follows:

The research I am doing focuses on policy and interventions aimed at preventing childhood obesity in the age group 6-12-year-old. The study will be undertaken at two Health Centers to try to establish what interventions are being carried out, what works and what does not, and, how policy informed the interventions.

The purpose of talking to you today is to get more information about the interventions that are underway and to explore your experience in the work that you have been doing in addressing the problem of obesity in children 6-12 years old in your area. The interview should last around one hour and thirty minutes, and with your agreement, I would like to tape record the interview.

This discussion now will cover key areas, including background information about the policy context of interventions, the perception of challenges, the perceived impact and any lessons learnt in delivery and implementation.

PART 1 – POLICY BACKGROUND IN YOUR AREA AND GENERAL INFORMATION ON THE INTERVENTIONS

Questions:

1. What is the policy context, or policy intervention drivers for childhood obesity prevention that support or underpin what you do?

2. Who are the main organizations active in the policy area, and how are they working together?

(I shall probe on how they collaborate, their roles, funding and ask for examples of collaboration covering health, nutrition, diet, sports, cycle paths, exercise, schools etc.)

3. What specific programs, projects and interventions are/were you involved in or are you aware of? (In pursuing this, I shall prompt with list of things identified in my desk analysis and list of things that ought to be happening but not sure if they are taking place. They will be asked to list the interventions, then if list is very long focus on the 3-5 most important.)

4. In what capacity were/are you involved in the interventions?

5. Why were these interventions established? Explore the need which is being addressed by the intervention /rationale.

6. How do these interventions link to local/ national policy on childhood obesity?

Explore national, regional, local level policies

Does it work alongside, or does it fill a gap?

7. What are the timings of the intervention – how long has it been running, and what is the future timetable?

8. Who/what are the target(s) of the intervention?

About each intervention identified, I shall probe:

Behavior – does the intervention target any specific attitudes or behaviors.

Environment or Populations – explore age range, sex, ethnicity, deprivation, levels of overweight or obese.

9. And where and when is each intervention delivered? E.g. in a school (probe where, classroom, hall), in a community center, in a GP surgery. Which time of year, time of day – and why were these timings chosen.

10. Could you explain how [the intervention] is funded and how the funding works?

11. Are there any financial constraints upon delivery?

Issues to be explored around funding – how well funded the intervention is, and how costs compare with predicted costs, do attendees need to pay out-of-pocket expenses to attend?

12. Are any innovative techniques or delivery methods used?

PART 2 – OUTCOMES

13. Tell me how effective do you perceive the intervention(s) have been at controlling childhood obesity in the target group in this research?

14. What are target outcomes, or outcome measures used?

I shall probe for concrete outcomes - for e.g., a 10% reduction in obese girls from different BMI groups (25-30, 30-35, >35). Alternatively, my probe will be for information on the type and nature of data being collected to inform progress.

I shall also explore any planned, or expected outcomes and any unexpected outcomes.

PART 3 – OUTCOMES, BARRIERS, AND FACILITATORS

15. Overall, in your judgment, how successful has the policy/intervention been to date at achieving its intended outcomes?

16. In your view, what has worked well in terms of implementation, and why? What have been the facilitators?

17. What, if any difficulties/barriers have there been in implementing the intervention(s)? Explore – support from colleagues/funders and partner organizations? Support from health / other experts – any linkages with other services? Any barriers posed by parents/children? Or, any social, cultural, economic barriers within organizations and with target groups? Are there any others?

18. What, if any feedback have you received from beneficiaries/ attendees about the intervention?

19. Have you, or your colleagues, noticed any changes in the individuals attending the intervention?

I shall seek to find out what research based or statistical findings or evidence exists Have there been changes in behavior – explore, physical activity, food, diet / nutrition. Are there clinical changes – weight gain or loss? Are there any noticeable /measured health improvements? Is there any change in the quality of life?

20. Finally, what would you say are the key factors which impact on the success of an intervention to prevent obesity and overweight in children?

CLOSING REMARKS

21. Can you think of anything else we should look at, or anyone else who you think that we should speak to, any final comments? Record details.

APPENDIX E: Ministry Consent (PS, Ministry of Health)

Institutional approval letter (if off AU campus):

Letter of Request for Ministry Consent (Permanent Secretary, Ministry of Health)

Office of Research and Creative Scholarship

(269) 471-6361 Fax: (269) 471-6246 E-mail: irb@andrews.edu

Andrews University, Berrien Springs, MI 49104-0355

[Date]

[Permanent Secretary, Ministry of Health; Name and Address]

Dear [Sir/Madam]

I am a doctoral candidate at Andrews University, USA, conducting research for my Doctoral dissertation. The purpose of my study is to explore and describe how interventions are used to address the issue of childhood obesity by Health Professionals in a rural and an urban area of the Republic. Accordingly, I will carry out an analysis of health policies of Trinidad & Tobago over the last ten years (2005-2015) which may have been the drivers for these initiatives. The research will be conducted under the supervision of my Research Committee in the Leadership Department at Andrews University, Berrien Springs, Michigan. USA.

For this purpose, I am respectfully requesting your permission for access to review health policy documents addressing the prevalence of childhood obesity, that were developed by the ministry over the past ten years (2005-2015), and which may have been the drivers for interventions carried out by health professionals throughout the country. Also, I am seeking your permission to request an interview with the Director of Health Education for Trinidad and Tobago.

In terms of interventions, my study will be limited to looking at the work of two health centers, one rural and one urban. Accordingly, the El Socorro and Manzanilla Health Centers have been chosen and applications are being made to the relevant RHA CEO, as I will need to conduct individual voluntary interviews with members of the team of

Health Practitioners – School Nurse/Health Visitor, Dietician, Doctor - who are engaged in the screening process of children 6-12 years old attending the Manzanilla and El Socorro Primary Schools. No child will be interviewed, but two focus groups of parents will be interviewed. It is anticipated that each interview session will not last longer than one and a half hours. The interviews will be recorded and transcribed verbatim. Participation in this study is voluntary and participants may decide to withdraw at any time without any penalty.

I undertake to treat the information collected in a confidential manner. Names will not appear in any dissertation or report resulting from this study. Tapes and other materials will be kept in a locked cabinet in my office, in the Department of Nurse Education at USC. The recordings will be destroyed after the research is completed. The results of the research will provide data which may prove beneficial in supporting the continued work in this area. Upon completion of the study, I undertake to provide you with a full copy of the report.

If you have any questions or require any further information, please do not hesitate either to contact me on 868-484-2505 or by email at, pwoolford@usc.edu.tt, or to contact the Chair of my dissertation committee, Dr. J. Brand on 269-471-3784, or by email at brand@andrews.edu. If you consent to this request, I would be grateful if you could sign and date this form in the section below, and have it returned to me at my office address: P M Woolford, Director of Nurse Education, University of the Southern Caribbean, Royal Road, St. Joseph, Maracas, Trinidad. I thank you for your assistance.

Yours Sincerely,

Phyllis Woolford. (Principal Researcher)

Minister/permanent Secretary: Signature and Date	

APPENDIX F: Institutional Consent (Regional CEO)

Request for Institutional Consent (Regional CEO)

[Date]

[Manager's Name and Address]

Dear [Manager]

I am a doctoral candidate at Andrews University, USA, conducting research for my Doctoral dissertation. The purpose of my study is to explore and describe how interventions are used to address the issue of childhood obesity by Health Professionals in a rural and an urban area of the Republic. Accordingly, I will carry out an analysis of health policies of Trinidad & Tobago over the last ten years (2005-2015) which may have been the drivers for these initiatives. The research will be conducted under the supervision of my Research Committee in the Leadership Department at Andrews University, Berrien Springs, Michigan. USA.

For this purpose, I am respectfully requesting your permission to visit the El Socorro and Manzanilla Health Centers and conduct individual voluntary interviews with members of the team of Health Practitioners – School Nurse/Health Visitor, Dietician, Doctor - who are engaged in the screening process of children 6-12 years old attending the Manzanilla and El Socorro Primary Schools. I am also asking for permission to have access and to review any relevant documents. It is anticipated that each interview session will not last longer than one and a half hours. The interviews will be recorded and transcribed verbatim. Participation in this study is voluntary and participants may decide to withdraw at any time without any penalty.

I undertake to treat the information collected in a confidential manner. Names will not appear in any dissertation or report resulting from this study. Tapes and other materials will be kept in a locked cabinet in my office, in the Department of Nurse Education at USC. The recordings will be destroyed after the research is completed. The results of the research will provide data which may prove beneficial in supporting the continued work in this area. Upon completion of the study, I undertake to provide your office and the Ministry of Health of Trinidad & Tobago with a full copy of the report.

If you have any questions or require any further information, please do not hesitate either to contact me on 868-484-2505 or by email at, pwoolford@usc.edu.tt, or to contact the Chair of my dissertation committee, Dr. J. Brand on 269-471-3784, or by email at brand@andrews.edu. If you consent to this request, please sign and date this form in the section below, and return it to me at my office address: P M Woolford, Director of Nurse

Education, University of the Southern Caribbean, Royal Road, St. Joseph, Maracas, Trinidad. I thank you for your assistance.

Yours Sincerely,

Phyllis Woolford. (Principal Researcher)

Regional CEO's Signature and Date	Witness Signature and date

APPENDIX G: Informed Consent (Focus Group Participant)

Informed Consent (Focus Group Participant)

[Date]

[Parent's Name and Address]

Dear [Parent]

I am a doctoral candidate at Andrews University, USA, conducting research for my Doctoral dissertation. The purpose of my study is to explore and describe how interventions are used to address the issues of childhood obesity by Health Professionals in a rural and an urban area of the Republic. Accordingly, I will carry out an analysis of health policies of Trinidad & Tobago over the last ten years (2005-2015) which may have been the drivers for these initiatives. The research will be conducted under the supervision of my Research Committee in the Leadership Department at Andrews University, Berrien Springs, Michigan USA.

For this purpose, I have requested Health Center Manager's permission to visit the center and conduct voluntary interviews with the Center Health Practitioners who are engaged in screening children 6-12 years old attending the Manzanilla and El Socorro Primary Schools; also to interview a focus group of parents at each center. It is anticipated that each interview session will not last longer than one and a half hours. The interviews will be recorded and transcribed verbatim. Participation in this study is voluntary and participants may decide to withdraw at any time without any penalty. I am therefore now requesting your consent to be interviewed in a focus group.

I undertake to treat the information collected in a confidential manner. Names will not appear in any dissertation or report resulting from this study. Tapes and other materials will be kept in a locked cabinet in my office, in the Department of Nurse Education at USC. The recordings will be destroyed after the research is completed. The results of the research will provide data which may prove beneficial in supporting the continued work in this area. Upon completion of the study, I undertake to provide the Ministry of Health of Trinidad & Tobago with a full copy of the report.

If you have any questions or require any further information, please do not hesitate either to contact me on 868-484-2505 or by email at, pwoolford@usc.edu.tt, or to contact the Chair of my dissertation committee, Dr. J. Brand on 269-471-3784, or by email at brand@andrews.edu. If you consent to this request, please sign and date this form in the section below, and return it to me at my office address: P M Woolford, Director of Nurse Education, University of the Southern Caribbean, Royal Road, St. Joseph, Maracas, Trinidad. I thank you for your assistance.

Yours Sincerely,

Phyllis Woolford. (Principal Researcher)

Parent's Signature and Date	Witness Signature and date

APPENDIX H: Informed Consent (Practitioners)

Consent form (for interview of Practitioner Participants):

To: The School Nurse/Health Visitor
The Doctor
The Dietician
[Date]

[Practitioner's Name and Address]

Dear [Practitioner]

I am a doctoral candidate at Andrews University, USA, conducting research for my Doctoral dissertation. The purpose of my study is to explore and describe how interventions are used to address the issues of childhood obesity by Health Professionals in a rural and an urban area of the Republic of Trinidad and Tobago. Accordingly, I will carry out an analysis of health policies of the Republic of Trinidad & Tobago over the last ten years (2005-2015) which may have been the drivers for these initiatives. The research will be conducted under the supervision of my Research Committee in the Leadership Department at Andrews University, Berrien Springs, Michigan USA.

For this purpose, I have requested Health Center Manager's permission to visit the center and conduct individual voluntary interviews with members of the team of the Center Health Practitioners who are engaged in the screening process of children 6-12 years old attending the Manzanilla and El Socorro Primary Schools; also to interview a focus group of six parents at each center; and to have access to review any relevant documents. It is anticipated that each interview session will not last longer than one and a half hours. The interviews will be recorded and transcribed verbatim. Participation in this study is voluntary and participants may decide to withdraw at any time without any penalty. I am therefore now requesting your consent to be interviewed.

I undertake to treat the information collected in a confidential manner. Names will not appear in any dissertation or report resulting from this study. Tapes and other materials will be kept in a locked cabinet in my office, in the Department of Nurse Education at USC. The recordings will be destroyed after the research is completed. The results of the research will provide data which may prove beneficial in supporting the continued work in this area. Upon completion of the study, I undertake to provide your Health Center and the Ministry of Health of the Republic of Trinidad & Tobago with a full copy of the report.

If you have any questions or require any further information, please do not hesitate either to contact me on 868-484-2505 or by email at, pwoolford@usc.edu.tt, or to contact the Chair of my dissertation committee, Dr. J. Brand on 269-471-3784, or by email at brand@andrews.edu. If you consent to this request, please sign and date this form in the section below, and return it to me at my office address: P M Woolford, Director of Nurse Education, University of the Southern Caribbean, Royal Road, St. Joseph, Maracas, Trinidad. I thank you for your assistance.

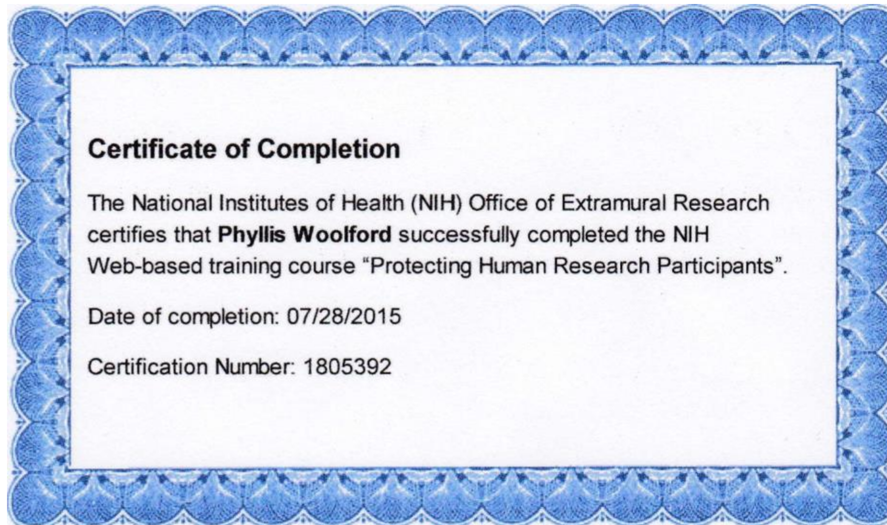
Yours Sincerely,

Phyllis Woolford. (Principal Researcher)

Health Practitioner's Signature and Date	Witness Signature and date

APPENDIX I: IRB Certificate

Protecting Human Subject Research Participants https ://phrp.nihtraining.com/us



Certificate of Completion

The National Institutes of Health (NIH) Office of Extramural Research certifies that **Phyllis Woolford** successfully completed the NIH Web-based training course "Protecting Human Research Participants".

Date of completion: 07/28/2015

Certification Number: 1805392

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VITA

Phyllis Mary Woolford

PERSONAL PROFILE

Phyllis M. Woolford is a highly experienced Nurse educator, practitioner, leader and current founder Director of the USC Nursing Department. She designed its program to offer the first 4-year BSc Nursing degree in Trinidad and Tobago, and skillfully managed its strategic development from 25 students in 2006 to the current 790. Her inspirational, innovative leadership has maintained an excellent team of faculty and clinical instructors, producing exemplary student performance.

EDUCATION

08/2011 – Present
Institution: *Andrews University, USA*
Degree/Qualification Awarded: PhD (cand.)

1991 – 1993
Institution: *Brunel University, England*
Degree/Qualification Awarded: MSc. In Health Promotion

1986 – 1988
Institution: *Bedford College of Higher Education, England*
Degree/Qualification Awarded: Diploma in Education

1982 – 1983
Institution: *West London Institute of Higher Education, England*
Degree/Qualification Awarded: RHV (Registered Health Visitor)

Jan – June 1980
Institution: *Polytechnic of the South Bank, London, England*
Degree/Qualification Awarded: Diploma in Nursing

June – Dec 1980
Institution: *Polytechnic of the South Bank, London, England*
Degree/Qualification Awarded: RCNT

CERTIFICATIONS

Professional

Registered General Nurse
Registered Fever (Infectious Diseases) Nurse
SCM (State Registered Midwife)
English Nursing Board 100 Certified
Registered Health Visitor
RSA Counseling (Rehabilitation)

Teaching

RCNT (Registered Clinical Nurse Teacher's Certificate)
ITC (Intensive Therapy Clinical Course Teacher)
RNT (Registered Nurse Teacher)
Certificate of Education (Further Education)

PROFESSIONAL APPOINTMENTS

2018 – Present Title: Vice President/ Treasurer

Institution Nursing Council of Trinidad and Tobago.

Assist the President in all required duties for the Council

01/2006 – Present Title: Director of Nurse Education Department

Institution: University of the Southern Caribbean

- Design the Nurse Education curriculum and develop robust delivery strategies.
- Develop a team of competent and motivated faculty and staff
- Achieve and maintain accreditation status
- Maintain high student enrollment (currently 790)