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Adolescent and Adult Perceptions of Adolescent Diet, Physical Activity, Body Size, and Obesity Prevention in Botswana

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Abstract

Obesity is a worldwide health problem affecting developed and developing nations. Botswana is an upper-middle income nation experiencing rapid urbanization, economic, and nutritional change. The combined prevalence of adolescent overweight and obesity has now surpassed underweight. Little is known regarding the adolescent and adult perceptions of adolescent diet, physical activity, body size, the meaning of obesity, and obesity prevention interventions. This qualitative-descriptive study uses Ecological Systems Theory to analyze and interpret data from 15 focus groups (12 adolescent and 3 parent focus groups of unrelated participants) conducted in Gaborone, Botswana. The purpose of this study is to describe the factors that influence adolescent and adult perceptions and attitudes related to adolescent diet, physical activity, body size, obesity and potential obesity interventions. Prolonged data immersion, clustering of analogous data into themes, and direct reporting of participant voices were used to provide a rich description of the shared experiences and perceptions of the study participants. Results indicate that adolescents identify healthy versus unhealthy foods, yet choose unhealthy foods based on taste preferences, social pressures, and the perceived affordability of unhealthy foods. Parents prefer a healthy diet for their adolescent children, although they acknowledge purchasing unhealthy foods for their children based on adolescent taste preferences and social pressures. Adolescent and parent participants suggest a body size analogous to normal weight is most desirable for adolescents themselves and most attractive in the opposite sex. Obese body sizes are associated with perceived laziness, isolation, and negative social stigma. Additionally westernized preferences are replacing the historical notion that a large body size is consistent with wealth, strength, and prosperity. Participants also perceive thinness to be related to illness, specifically suspected HIV infection due to the relatively high prevalence of HIV infection in Botswana. Adolescents and parents of adolescents show a willingness to participate in obesity prevention programs. Participants suggest that any school-based program be voluntary, entertaining, informative, involve parents, take into consideration peer influence, and increase healthy food offerings while not eliminating individual choice. An ecological, school-based obesity prevention program with parent involvement should be developed for this adolescent population.

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Corbett D. Brown

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ABSTRACT

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Obesity is a worldwide health problem affecting developed and developing nations. Botswana is an upper-middle income nation experiencing rapid urbanization, economic, and nutritional change. The combined prevalence of adolescent overweight and obesity has now surpassed underweight. Little is known regarding the adolescent and adult perceptions of adolescent diet, physical activity, body size, the meaning of obesity, and obesity prevention interventions. This qualitative-descriptive study uses Ecological Systems Theory to analyze and interpret data from 15 focus groups (12 adolescent and 3 parent focus groups of unrelated participants) conducted in Gaborone, Botswana. The purpose of this study is to describe the factors that influence adolescent and adult perceptions and attitudes related to adolescent diet, physical activity, body size, obesity and potential obesity interventions. Prolonged data immersion, clustering of analogous data into themes, and direct reporting of participant voices were used to provide a rich description of the shared experiences and perceptions of the study participants. Results indicate that adolescents identify healthy versus unhealthy foods, yet choose unhealthy foods based on taste preferences, social pressures, and the perceived affordability of unhealthy foods. Parents prefer a healthy diet for their adolescent children, although they acknowledge purchasing unhealthy foods for their children based on adolescent taste

preferences and social pressures. Adolescent and parent participants suggest a body size analogous to normal weight is most desirable for adolescents themselves and most attractive in the opposite sex. Obese body sizes are associated with perceived laziness, isolation, and negative social stigma. Additionally westernized preferences are replacing the historical notion that a large body size is consistent with wealth, strength, and prosperity. Participants also perceive thinness to be related to illness, specifically suspected HIV infection due to the relatively high prevalence of HIV infection in Botswana. Adolescents and parents of adolescents show a willingness to participate in obesity prevention programs. Participants suggest that any school-based program be voluntary, entertaining, informative, involve parents, take into consideration peer influence, and increase healthy food offerings while not eliminating individual choice. An ecological, school-based obesity prevention program with parent involvement should be developed for this adolescent population.

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CHAPTER 1: SPECIFIC AIMS

Botswana is an upper-middle income nation undergoing rapid and steady urbanization, and economic and societal change. Additionally there is evidence of associated changes in dietary and health patterns that is supported by the nutrition transition framework (NT)(1). Historically, underweight in Botswana, as in many African nations, was the main nutrition related health problem(2). Recently the combined prevalence rates of overweight and obesity have surpassed that of underweight. This is especially true in the urban areas, among women, and among those of relatively high socioeconomic status (SES)(2, 3).

Adolescent and adult weight status are classified according to the World Health Organization guidelines for interpreting Body Mass Index (BMI) (BMI = [mass (kg) / height (meters)^2]). Adolescent underweight, normal weight, overweight, and obesity are classified by age and gender specific BMI z-scores of less than -2 standard deviations, -2 to +1 standard deviations, between +1 and +2 standard deviations, and +2 standard deviations and greater, respectively(3). Adult underweight, normal weight, overweight, and obesity are defined by a BMI less than 18.50 kg/m^2, from 18.5-24.99 kg/m^2, from 25.00-29.99 kg/m^2, and 30.00 kg/m^2 or greater, respectively(2).

A cross-sectional, nationally representative study of 707 Botswana adolescents attending secondary schools found that the combined prevalence rates of overweight and obesity have surpassed that of underweight. A combined 17% of Botswana adolescents were overweight or obese (12% and 5% respectively) as compared to 5% underweight. Additionally, adolescents attending private schools, as well as those with more home assets (surrogate measures of socioeconomic status [SES]), had a higher prevalence of

overweight and obesity than their public school peers (private: 27.1%, 95% confidence interval [CI]: 20.4-34.5; public: 13.1%, 95% CI: 9.8-16.8) and those with fewer home assets (more assets: 20.0%, 95% CI: 16.0-24.4; fewer assets: 11.2%, 95% CI: 6.6-16.9)(3).

In the year 2011, 28% of all adults in Botswana were classified as overweight or obese compared to the roughly 15% of all adults who were classified as underweight. Additionally the prevalence of overweight and obesity are higher among women than men. Twenty-three percent of women were classified as overweight as opposed to 13% of men. Similarly 15% of women were classified as obese compared to just 3% of men. Of the adults who were overweight or obese, older age, residence in a city or town, being currently married, and higher educational achievement were statistically significant demographic factors associated with weight status ($p<0.05$)(2).

As expected in nations undergoing the NT, including Botswana, urbanization and higher SES are positively associated with increasing prevalence rates of overweight and obesity(3). In addition to the NT, the Ecological Systems Theory (EST) facilitates the conceptualization of macro- and microsystem factors influencing obesity development including: societal, community, school, familial, and individual factors. The EST captures the effects of these influential factors related to obesity development among individuals (e.g., diet, physical activity, body image)(4-6).

Additionally, non-communicable nutrition-related diseases (NCD) such as diabetes mellitus, hypertension, hyperlipidemia, coronary artery disease, and some forms of cancer are positively correlated with expanding prevalence rates of overweight and obesity in transitioning nations. Also, NCDs are positively associated with increased

morbidity, mortality, and increased healthcare costs. Because of the relatively high prevalence of HIV infection (17.6%) in Botswana and its corresponding burden in terms of morbidity, mortality, and healthcare costs, the addition of NCDs poses a threat to the nation's already taxed healthcare system(7, 8).

In a qualitative descriptive study using semi-structured interviews of school administrators, physical education (PE) teachers, and food shop managers in 6 secondary schools in Botswana of varying SES (based on level of private vs. public schools), it was found that school personnel were aware that unhealthy foods were offered within their schools. Additionally, the school personnel favored modifying the school food environment to offer healthier options in addition to making changes to PE classes and offering other opportunities for increased physical activity among the adolescent student body. While the school personnel supported the notion of parental involvement as an important part of creating an obesity prevention program within schools, several potential limitations to parental participation were voiced, including inflexible parental work schedules and a lack of concern that overweight and obesity are significant health problems(9).

Currently only the prevalence of adult and adolescent overweight and obesity in Botswana, as well as school personnel's perceptions of obesity and possible interventions are known. Little else is known regarding the perceptions of adult and adolescent groups regarding overweight and obesity (hereafter referred to as "obesity"), their determinants, and potential interventions to prevent increasing prevalence rates of obesity. Knowledge of adolescent and adult perceptions surrounding obesity, body size and potential obesity prevention interventions are key to identifying and designing effective interventions for

this specific community. Qualitative description is a valid and reliable method for elucidating the thoughts, feelings, and perceptions of groups of individuals. This is especially true where little is known regarding a particular research topic, and where understanding the perceptions of the individuals from a certain group will assist in designing interventions for that group(10).

The purpose of this qualitative descriptive study is to:

Describe the factors that influence adolescent and adult perceptions and attitudes related to adolescent diet, physical activity, body size, obesity and potential obesity interventions in Botswana.

Additionally, an exploratory objective of this study is to:

Explore the perceptions of adolescent body size as reported by adolescents and by adults who are parents of adolescents.

CHAPTER 2: BACKGROUND AND SIGNIFICANCE

Overweight and obesity, once considered nutrition-related problems associated with developed nations, are now reaching epidemic levels worldwide. In the year 2005 approximately 23.2% and 9.8% (937 and 396 million) of the world's adult population were overweight and obese, respectively. Conservative projections of worldwide adult overweight and obesity for the year 2030 are 1.35 billion and 573 million, respectively. If future projections are based on current trends, then the situation is much more dire, with projected adult overweight and obesity worldwide as 2.16 billion and 1.12 billion, respectively(11).

The Nutrition Transition (NT) Framework organizes an understanding of the macroeconomic drivers of increasing obesity worldwide. The NT theorizes that as nations progress economically, food production moves away from dependence on subsistence farming to industrialized agricultural production. Additionally there is an associated shift in lifestyle patterns leading to a dramatic shift in diet and physical activity. The NT related changes in lifestyle patterns alter the energy-balance equilibrium leading to increased risk of obesity. The energy expenditure required in personal and employment related transportation decreases significantly while the availability of food increases rapidly. Additionally, the foods available become highly processed and industrialized, which leads to lower prices and increased availability of highly processed, high energy-dense foods. Combined, fewer daily demands for physical activity and ready access to foods high in energy density can lead to caloric surplus with the resultant increased prevalence of obesity(1, 12).

While the NT framework is divided into five distinct patterns, the fourth pattern,

that of Degenerative Disease, is the predominant pattern found throughout the world. Degenerative Disease is characterized by the transition from underweight to obesity associated with increasing urbanization, high SES in developing nations and low SES in developed nations, and a shift in the food environment to nontraditional foods. Of note, Degenerative Disease is followed by the fifth pattern of NT, Behavior Change, wherein behavior modification is the focus of obesity prevention and treatment(1, 12).

Botswana is an upper-middle income nation undergoing rapid urbanization, and economic and societal change. As expected as part of the NT, Botswana is demonstrating many of the characteristics of Degenerative Disease. Specifically, obesity prevalence is highest among individuals living in urban areas (versus rural) as well as those with relatively high SES (versus moderate or low SES)(3). Additionally overweight and obesity combined have surpassed underweight in Botswana as the priority nutrition related health problems. This is true for both children and adults. Co-occurring obesity and underweight has also been seen in other nations as well, including South Africa and Nigeria, where obesity and underweight have been found in the same SES groups at the same period of time(13-15).

As denoted by its title, Degenerative Disease, the fourth pattern of the NT predicts that Botswana will experience increasing prevalence of overweight and obesity as well as increasing prevalence of nutrition related chronic diseases (NCD). These non-communicable NCD including diabetes mellitus, hypertension, coronary artery disease, and some forms of cancer are on the rise in Sub-Saharan Africa, and specifically in Botswana(16, 17). While obesity and chronic disease are significant health related threats to Botswana's future, the potential increases in healthcare expenditures related to

obesity-related chronic diseases are another important variable negatively affected by increasing obesity. Currently the majority of Botswana's healthcare expenditures are earmarked for the treatment of HIV/AIDS. The additional cost of nutrition-related NCD could overwhelm Botswana's national healthcare system(7). Even more worrisome is recent evidence that this process of expanding obesity is speeding up in nations like Botswana undergoing rapid economic development(1).

In order to avoid a potential future healthcare crisis, where communicable disease and NCD combine to overburden Botswana's healthcare system, as well as to reduce the number of overweight and obese individuals, effective public health interventions must be established. Prior to designing and implementing any intervention, it is important to understand the perspectives of the stakeholders to be served by the intervention. This basic understanding of the viewpoints of the stakeholders is fundamental in designing interventions tailored to incorporate the particular beliefs, needs, and wants of any one group. Additionally, this approach allows for the identification and resolution of any potential misinformation or false health related beliefs.

Specifically in regards to interventions focused on obesity treatment and prevention, it is desirable to elucidate stakeholder perspectives in the following areas: diet, physical activity, body size (visual appearance based on true physical size), obesity and potential obesity interventions. An understanding of key stakeholders' perceptions of diet and physical activity will provide researchers and public health personnel with a starting point from which they might modify two of the largest determinants of obesity, namely diet and physical activity. Additionally understanding stakeholders' perspectives on obesity, body size, and possible interventions allows researchers and public health

personnel to design interventions that take into account the nuanced perceptions of the specific population. Without this key information there is a risk of developing ineffective obesity interventions for the target population.

Perceptions of a Healthful Diet

The traditional diet of developing nations consists of unprocessed, low energy-dense foods that are high in plant-based nutrients and low in animal-based proteins and oils(18). This is the case for the traditional African diet as well as the traditional diet of Botswana, which is comprised of low energy-dense foods (whole fruits, vegetables, and healthful starches-legumes, and maize), lean animal proteins, and relatively little added sugar or oil(19, 20). As Africa, and Botswana specifically, move along the NT, non-traditional, westernized foods replace the traditional foods as part of the daily diet(20). The non-traditional diet contains higher amounts of added sugars, animal fats, and animal proteins; contains less dietary fiber; and generally provides fewer servings of fresh fruits and vegetables in developing nations(12, 19). This is of concern because non-traditional diets are of relatively high in energy density and are positively associated with an increased risk of overweight and obesity(12). Accordingly, decreasing consumption of the traditional Botswana diet among adolescent school students is positively associated with increased prevalence of overweight and obesity(20).

While the increasing availability of non-traditional foods facilitates their consumption, the perception of what traditional and non-traditional foods mean in terms of healthfulness and social meaning is important in understanding some of the psychosocial drivers of poor eating habits and the subsequent risk of obesity. Adolescents in nearby Cape Town, SA correctly associate overeating and poor eating habits to the

risk of obesity, however, the majority of these adolescents also perceive foods sold in school tuck shops as healthy(21). Tuck shops are small booths that predominantly sell pre-packaged high energy-dense foods, fizzy drinks, and candy(9). South African adolescents believe that all foods sold within schools, including through Tuck Shops found at schools, are healthy options(21). This may also influence the adolescent student food purchasing behaviors in Botswana, as Tuck shops are commonly found within Botswana schools(9). What is known of food purchases made by adolescent students in Botswana secondary schools comes from school personnel (PE teachers, administrators, and tuck shop clerks). They note that students seem to prefer non-traditional foods generally, and increase purchases of those foods on days when traditional foods (e.g., beans) are provided as part of the school lunch. While the school personnel view the food sold in Tuck Shop options as unhealthy relative to the traditional, healthy food options, the perceptions of adolescent students in Botswana are currently unknown(9).

In addition to perceptions of healthfulness, the perception of what food means is important. Cameroonian urban-living adolescents from high SES households prefer sugar-sweetened foods when eating at home as well as when purchasing foods at school. Additionally these adolescents perceive food's purpose as being for pleasure or beauty, as well as for purposes of growth, health, and life(22).

Perceptions of unhealthful foods as desirable, or erroneously viewed as healthy, may support the development of obesity in adolescents(23). Little is known of the diet-related perceptions of Botswana adolescents. Additionally, adult perceptions of what constitutes a healthful diet for adolescent students in Botswana are unknown. Information about adolescent and parent perceptions of the healthfulness of traditional and non-

traditional diets for adolescents is lacking for Botswana.

Perceptions of Physical Activity

Decreasing physical activity (PA) is a hallmark of the NT and one determinant in increasing obesity(12). The total decrease in PA is as a result of a shift from strenuous to less strenuous occupations (farming or mining to service sector jobs), fewer PA requirements within the same occupations, increased use of mechanized transportation, and decreased PA as part of leisure activities(24). Additionally, increasing urbanization and private school attendance (a surrogate measure of high SES status) are positively associated with decreased PA among adolescents in urban Botswana as compared to adolescents living in towns and rural villages. This is true in spite of mandatory versus optional physical education programs in private and public schools, respectively(25). In addition to increasing urbanization and mechanization of transportation and work, perceptions of the meaning of PA and of barriers to being physically active may also play a role in the PA shift as part of the NT. Nigerian adults who perceive their neighborhood as safe from crime and dangerous traffic patterns are more likely to engage in increased PA, while those who view their neighborhood as unsafe are less likely to be physically active(26). Additionally, Nigerians in urban areas perceive their environment as being less conducive for walking based on the presence of fewer dedicated walkways, the lack of aesthetic beauty along existing walkways, and the placement of walkways in areas of mixed land use, or residential and industrially zoned areas(27). While the built environment, and the perception thereof, may affect PA, the perceptions of the meaning of PA regarding health is in and of itself important. School personnel in Botswana suggest adolescents and their parents have a potential lack of knowledge regarding the

positive effects of PA(9). And while weight loss may be a positive result of increased PA, the fear of losing too much weight and the fear of being perceived as possibly having HIV/AIDS infection may negatively affect PA levels(28). Levels of PA are decreasing in sub-Saharan Africa, including Botswana. Little is known of the direct perceptions of adolescents and adults in sub-Saharan Africa about PA and adolescent health(16). This is especially true in urban Botswana among adolescent school students and adults.

Perceptions of Adolescent Obesity and Body Size

Obesity is increasing among adults and adolescents in urban Botswana(2, 3). School personnel from secondary schools in Botswana perceive obesity as a problem for some but not all of the students in their schools(9). Similarly, Malete et al. found that overweight and obese adolescents demonstrate some awareness of their true weight status and actual body size when asked to respond to a Body Image Questionnaire(25). Overweight and obese adolescent school students in Botswana expressed that their body weight and size were farther from the ideal and that they had greater dissatisfaction with weight and body size than their normal-weight peers. (25). This study raises questions about the source of such perceptions (personal, peer, parental, or community values) and the extent of obesity stigma in adolescents, questions that can only be answered by qualitative research methods. Little else is known about the meanings of adolescent obesity and desired adolescent body size among Botswana adolescents or adults.

In neighboring South Africa, overweight women do not perceive themselves as being overweight, and view thinness as being synonymous with HIV infection or AIDS(28). Similarly, South African girls and adolescent females identified their parents' perception of excess weight as a sign of wealth and health. Additionally, these

respondents suggested that their parents viewed thinness as signs of wasting or ill health(29). Conversely, girls in Cameroon desired a little extra fat for a desirable body shape, but did not want to gain too much body weight(22). Interestingly some individuals may not correctly identify their current (excess) weight as indicating overweight or obesity. Such is the case in the Seychelles where 54% of overweight and 18.8% of obese adults perceived their weight status as normal-weight(30). Additionally, a very small percentage of overweight and obese South African women living in rural villages are dissatisfied with their current weight, 4% and 25%, respectively(31). There seems to be a general underestimation of actual weight among individuals in Sub-Saharan African nations.

Aside from weight, use of body silhouettes in identifying ideal body shapes and meaning of those shapes is helpful, and has been accomplished in Sub-Saharan Africa. School personnel in Botswana correctly identified underweight and obese body shapes as undesirable and unhealthy, however most also identified several of the overweight body shapes as ideal(9). Similarly South African community health workers chose the moderately overweight body shape as their most preferred (BMI 27 kg/m2) and associated it with the terms "dignity, respect, confidence, beauty, and wealth"(32). Interestingly, South African mother-daughter dyads from black families perceived their own body size to be bigger than reality, yet they were significantly less dissatisfied with their own body size than white mother-daughter dyads ($p<0.01$), and chose heavier body silhouettes as those demonstrating beauty, respect, and happiness(33). Black African girls living in Cape Town, SA also perceived body shapes associated with overweight and obesity to demonstrate happiness, wealth, strength, and respectability. Conversely these

same girls perceived thin body shapes as demonstrating poor health generally, and chronic conditions causing wasting, specifically HIV/AIDS and tuberculosis(29).

Perceptions of African adolescents and adults regarding the causes and consequences of overweight and obesity are important aspects of developing targeted obesity interventions. Perceived causes of overweight and obesity include genetic predisposition, consuming too much food, consuming the 'wrong' types of foods (unhealthy foods), and increased stress due to financial problems(29, 31). Perceived consequences of overweight and obesity are nutrition-related chronic diseases (NCD) (diabetes mellitus, hypertension, cardiovascular disease, and poor vision), clothing not fitting correctly, husbands possibly wanting their wives to be a size or two smaller, teasing, and general social stigma (especially for female adolescent students)(9, 29, 34).

Obesity Interventions

Early initiation of prevention of overweight and obesity may be the most promising solution for developed and developing countries(35). This is especially true because opinions and beliefs regarding body image and self-worth start in early childhood(29). School personnel in Botswana suggest that healthier foods should be offered within schools in place of the unhealthy options(9). This may not be true for all schools. Some schools hesitate to enact significant changes to the school food environment for several reasons. School personnel may be in denial that the school food is a contributor to obesity. Additionally there may be a financial incentive for maintaining school tuck shops, and unhealthful foods generally because their sales provide revenue for schools(9, 36).

Regional recommendations for obesity prevention interventions include the use

of a multidisciplinary group of stakeholders including parents, the entire family, church groups, and the community generally(6, 28, 33). Interventions should be culturally based, focusing on dispelling the myth that excess weight equates to wealth, health, and respect; include reasonable expectations of weight-status and weight loss if required; incorporate education regarding healthy eating; promote increasing physical activity, and lead to long-term behavior change(28, 33).

School personnel in Botswana noted that parental involvement is important as part of any intervention, however, they also suggested that conflicts with parental work schedules and possible lack of parental concern about overweight and obesity might be limiting factors of any school-based obesity intervention(9). The perception that parental involvement and perceptions pose the biggest challenge is interesting in light of the recommendations that parents and families be heavily involved in any intervention(33).

Perceptions of diet, PA, body size, obesity, and potential obesity interventions are influenced by macro- and micro-level factors occurring on multiple fronts over time. Many of these multidimensional influences are captured through the concurrent use of the NT and EST frameworks. Together the NT and EST frameworks help explain how national economic growth, increasing urbanization, industrialization of food, and changes in PA intersect with societal, community, cultural, school, familial, and individual influences in increasing risk factors for the development of obesity.

For example, the NT describes the economic and developmental drivers of increasing availability of energy-dense foods, while the EST describes the internalized reasons why individuals might desire a nontraditional diet over a traditional diet. Additionally, decreasing levels of PA related to changes in transportation, labor, and

leisure activities are described by the NT. The EST framework provides a basis for understanding the social constructs of PA including that of weight loss (internalized fear of peer judgment) as well as other social, community, cultural, familial, and individual influences on PA.

Together, the NT and EST frameworks help explain many of the known factors influencing the development of obesity (those external and internal to the individual). It is important to acknowledge that limitations arise regarding the number of factors that can be considered together within a research study. The objectives of this study are focused on several research concepts that can be analyzed within the scope of qualitative descriptive analytic methods.

Innovation and Significance

This is the first study of its kind in Botswana to provide a qualitative description of the perceptions of adolescents and adults regarding obesity prevention. Grounded in a conceptual understanding of multilevel influences, this study will further our understanding of adolescents and adult parents of adolescents regarding their perceptions of adolescent diet, PA, obesity, body size, as well as acceptable obesity interventions. This knowledge will inform the work of future researchers, public health professionals, and national and local government. Additionally, obesity prevention interventions may find direction through utilizing the findings of this study.

CHAPTER 2: RESEARCH DESIGN AND METHODS

Due to this study being the first of its kind in Botswana, it is important that the study participants' own meanings be reported accurately, clearly, and without assumptions of meaning. For these reasons qualitative-descriptive methods were

used(37). This qualitative-descriptive study utilized data originating from 15 separate focus groups that were conducted in Gaborone, Botswana. Of the 15 focus groups, 12 consisted of adolescent-only participants and three consisted of adult participants. Each adolescent focus group was conducted in one separate session. Additionally, each focus group consisted of six to eleven participants. The adolescent focus groups were comprised of either all male or all female participants between 12-18 years of age. The adolescent focus groups were stratified by age to parallel the ages of adolescent students in Botswana public and private secondary schools. Also, adolescent focus groups were conducted with only male or female participants in order to study the perceptions of adolescents of the same sex. Similarly, the three adult focus groups consisted of eight to ten participants who attended without their adolescent children present. The parent and adolescent focus group participants were not related and do not represent true dyads. The objectives of the adolescent and adult focus groups were to elicit the participants' perceptions of diet, PA, body size, obesity, and potential interventions aimed at preventing or treating adolescent obesity. Adolescent and adult focus group guides were used to provide direction for the semi-structured format of the focus groups (See Appendices A & B). The questions found in the focus group guide are based on the multi-level factors captured by the EST. For example, open-ended questions regarding dietary preferences posed to adolescents participants allowed them to voice their perceptions about healthful diets (e.g., 'Let's start by going around in the circle and each of you sharing with us what you think is the most desired diet.'). If responses provided insufficient details, the moderator then asked focused questions of the group (e.g., Why do you desire this diet?; What foods are not included in your idea of a desired diet?

Why?). Internal (personal perceptions) and external (community, social, familial) influences found in the EST were elicited through this process.

Similarly, adult perspectives of influences of adolescent dietary needs were elicited using analogous questions. The questions of the adult focus group guide were also based on the EST framework. Additionally, the same process of questioning was used in the adult groups as was used in the adolescent groups. Open-ended question were followed by focused questions as needed. For instance, participants in the adult focus groups were asked to comment on what they perceive to be the most desirable diet for their child ('Let's start by going around in the circle and each of you sharing with us what you think is the most desired diet for your child.') Similar to the adolescent focus groups, the moderator asked focused questions of participants if specific details were not provided ('Why do you desire this diet for your children?'; 'What foods are not included in your idea of a desired diet? Why?'; 'How are the foods that you eat different from the foods that your child eats?').

Together the adolescent and parent perspectives elicited by the questions found in the focus group forms provided a rich dataset. This rich dataset aided in describing factors influencing PA, body size, obesity, and potential obesity interventions.

Protection of Human Subjects

Human subjects were used in this qualitative-descriptive study of adolescent obesity in Botswana. All human subjects were enrolled in Botswana and none in the United States. The University of Pennsylvania and University of Botswana Institutional Review Boards approved the original study protocols, protections of human subjects, and consent and assent forms utilized in the study. The University of Pennsylvania IRB

provided continuing approval of the original study, including the primary analysis of the study data, which is the aim of this current doctoral dissertation.

Subject Recruitment

Six public and private schools within Gaborone, Botswana were purposefully selected as representative of students of lower and higher SES background. The setting of Gaborone was selected because the prevalence of overweight and obesity (16.9% overweight and 8.5% obese) in adolescents was markedly higher in cities, than in more rural settings in Botswana (4.9% overweight and 0% obese)(3). Purposeful sampling of research participants was useful in ensuring diversity in focused research studies(38). Purposeful selection of schools was based on individual school classification as public (low SES) or private (high SES). Purposeful sampling within each of the study schools was directed by school personnel and aimed at selecting a heterogeneous group of participants based on SES factors and body size.

In each of the six chosen schools, 6-12 boys and 6-12 girls were purposefully selected to be diversified based on visual assessment of body size made by school personnel and the research team. Too many focus group participants may preclude all participants from speaking, while too few may cause participants to feel compelled to speak when in reality they had nothing to add(38). Additionally, in one of the six schools, three male and three female participants were recruited from each of the three grade-levels found within each school (level 1, 2, and 3) in an effort to enroll participants of heterogeneous age. To complete enrollment and fill each focus group, parent permission forms were sent home in the care of each adolescent participant. Once nine adolescents were recruited for each focus group, enrollment ended.

Parent recruitment was originally planned to take place from each of the six schools where adolescent recruitment had occurred. After insufficient participation of parents from the six schools, the research team attempted to recruit adults (who had adolescent aged children of their own) from the church congregations within Gaborone. The adult participants who were recruited had their children attending one of the six study schools. In an effort to recruit parents from analogous backgrounds as the adolescent participants from the six schools, an effort was made to enroll parents who had children in public or private schools (representative of low-, middle-, and high-income groups).

Purposeful recruitment of parents in schools and Parent Teacher meetings (PTA) was accomplished after an announcement was made at the PTA meeting and to parents at schools as they came to pick up the children from school. Those parents interested in participation in one of the three parent focus groups, who also met the inclusion criteria, were able to sign-up for the study by including their name and telephone numbers.

Key Inclusion Criteria

The inclusion criteria for adolescents in the study was age (12-18 years) and current student enrollment in one of the six schools purposefully selected schools in Gaborone.

Inclusion criteria used for adult enrollment was based on living in Gaborone and having at least one adolescent child (aged 12-18 years) enrolled in a secondary school (public or private).

Key Exclusion Criteria

Students who were younger than 12 years of age or older than 18 years old or

not attending any of the six purposefully selected schools were excluded from participation in the study. There were no other exclusion criteria (e.g., medical conditions).

Adults were excluded if they lived outside of Gaborone or did not have a child 12-18 years of age currently enrolled in school.

Focus Group Format

Focus groups provide a valuable format for qualitative data collection. These semi-structured group sessions facilitated the creative process of the focus group by which participants produced rich data regarding the designated study topics(38).

Prior to the day of each focus group, adolescent participants were purposefully selected, parental permission forms were completed, and sufficient participants were recruited for each focus group, with the goal of recruiting 6-12 participants.

The same two-person research team conducted all focus groups suggesting equivalency between focus groups(38). The research team consisted of the focus group moderator while the research assistant acted as recorder. The main responsibilities of the focus group moderator were to lead introductions and initiate the start of the focus group, conduct the focus group utilizing the Focus Group Guide for adolescent groups or for adult groups (Appendices A, B), and to close the focus group at the completion of the interview guide(38).

At the start of each focus group the moderator reviewed with the participants the objectives of the study as well as inclusion criteria. Parental focus groups differed slightly from adolescent groups in that adults received a small travel stipend of 50 pula (approximately $7 USD) to mitigate travel expenses to the University of Botswana

campus. Adults were also offered refreshments as a courtesy.

Each focus group was held in a quiet and private space at the participating school (adolescent focus groups) or University of Botswana (parent focus groups) and lasted between one to two hours in duration.

At the start of each focus group the moderator began by thanking the participants for their attendance and asked to complete written consent or assent for the parent and adolescent focus groups, respectively. These forms were available in Setswana and English. As part of the consent process, the moderator described the research purpose, activities, risks and benefits, alternatives, costs, compensation, and privacy policy to the adolescent or parent focus groups. After a thorough review of the entire consent/assent forms and a question and answer period regarding the focus group purpose, participants were asked to sign the forms or leave the group if their decision to join the group had changed. All focus group participants answered in the affirmative and chose to continue.

Once the focus group started, the audio recorder was turned on, participants were assigned de-identified participant IDs, and the semi-structured focus group moved forward utilizing the adolescent or parental focus group interview guides (see Appendices A and B, respectively).

Participants were free to speak in Setswana or English as part of the focus group process. When participants' responses were given in Setswana, those responses were included in the transcription process and translated from Setswana to English by a native Setswana speaker who was also fluent in English. Methodical translation of research data from non-English languages to English provides accuracy of original meaning(39).

Ensuring rigor or credibility of focus group data was an imperative part of data

collection(38). As the focus group guide was completed, the moderator summarized the statements made by the group and offered time for the participants to clarify their statements, ask questions, or express concerns. This process of summarizing, clarifying, and elucidation is an example of member checking, whereby the researcher restates what the participants said as a way of verifying accuracy in perceived meaning. Member checking was an important method of adding credibility in this qualitative research(38). Once participants were finished clarifying, questioning, or expressing any relevant concerns, the moderator thanked the attendees for participation and closed the focus group. After the participants departed from the focus group the moderator and the research assistant (acting as recorder) reviewed the focus group notes for each question discussed in the focus group. The research team then answered quality improvement questions related to improving future focus groups in the study. Process improvement ensured that the research team learned from previous focus groups and interviews and improved quality in subsequent data collection(40).

Focus Group Guide

Focus groups were given structure through the use of the adolescent and adult focus group collection forms (appendices A & B). The focus group guides were comprised of multiple sections. The identification section of the guide provided areas where the research team should note identification codes for each focus group including: School, Location of focus group sessions, Date of focus group, Moderator, Recorder, Start time, End time, and Duration. The main body of the focus group collection form consisted of three main parts: I-Introduction; II-Questions for Participants; and III-Discussion between Moderator and Recorder. Part I, Introduction, guided the

Moderator and Recorder in preparing for and managing the focus group. Additionally, the Introduction guided the research team in the processes of: welcoming participants; ensuring sampling criteria among participants were met; confirming parental consent and adolescent assent forms were completed; reading consent/assent forms to the group; soliciting questions regarding consent/assent and asking attendees if they would like to participate, and if so, if they would sign the consent/assent forms; advising participants of confidentiality and de-identification of responses; and importance of respect for other's answers and honest sharing of one's own views. Part II, Questions for Participants, consisted of seven open-ended questions (supported by additional focused questions as needed) to elicit participant responses regarding the research study aims. The wording of the questions found in the adolescent focus group guide elicited the perspectives of the adolescents themselves about diet, PA, body size, obesity, and potential obesity interventions (e.g., 'Let's start by going around in the circle and each of you sharing with us what you think is the most desired diet.'). The wording of the analogous questions from the parent focus group guide elicited the adults' perspective about their own child's diet, PA, body size, obesity, and potential obesity interventions (e.g., 'Let's start by going around in the circle and each of you sharing with us what you think is the most desired diet for your child.'). Questions one through six systematically elicited data regarding specific components of the study aims (e.g., diet, PA, etc.). Additionally, ten body silhouettes of African male or female body shapes, labeled 1-10, were showed to the study participants. These silhouettes corresponded with focus group guide question number four. The ten body silhouettes represented a visual representation of thin (1), normal weight (2-4) and overweight to obese (5-10). The objective of the seventh

question was to summarize, confirm, and expound on the data provided by the participants as they answered questions one through six. Together, the seven questions and supporting focused questions in the adolescent and parent focus group guides elicited participant perspectives regarding the societal, community, familial, and individual factors influencing the development and potential treatment of obesity. These multilevel factors are consistent with, and are clarified through, the EST framework.

Part III, Discussion between Moderator and Recorder, was completed after the focus group participants exited, and was focused on process improvement. Specifically, the research team discussed the following: "What went well about the focus group?"; "What could be improved or next time?"; and, "What topics surprised you in the focus group?".

Confidentiality

De-identification of data was key in providing confidentiality(38). The current analysis of parental and adolescent focus group data utilized only de-identified data. The researcher did not have access to participant names or any of the focus group recordings. Additionally, the protocol followed by the original study provided for participant confidentiality through adhering to the following steps. Each focus group session was audio recorded for accuracy in later transcription. At the beginning of each focus group, participants were assigned a numerical identifier (Participant 1, Participant 2, etc.) to replace participant names. Transcription of the focus group audio recordings included the de-identification process of labeling participant responses with their participant ID (Participant 1, Participant 2,…, Participant 12). After thorough-accurate transcription and de-identification the audio recordings were erased. All other documentation related to

the focus groups is locked in a filing cabinet in a secured office at the School of Nursing at the University of Botswana.

Consent and Assent Forms

Written parental consent and adolescent assent were obtained prior to day of each adolescent focus group. Parental consent forms were sent home with adolescents who presented the consent form to their parents. Based on the consent form alone, parents were asked to read the form, and sign and return it to the school to demonstrate interest in allowing their children to participate in the study. Telephone communication with classroom teachers confirmed that sufficient numbers of students with parental consent were able to participate in the adolescent focus groups. Prior to beginning of each focus group the student assent forms were discussed, read, and signed. Each focus group commenced with a formal introduction and either written consent or adolescent assent for the adult and adolescent focus groups, respectively. The consent and assent process included a thorough description of the research study's purpose, the research activities, the risks and benefits of the research, alternatives to research, costs, compensation, and privacy policy. The consenting process involved the review of each section of the consent form for the focus group, time set aside for participant questions or concerns, and the option for each participant to decline participation in the study prior to signing the consent or assent forms.

Data Management

Data management protocols were developed and followed with exactness in protecting the data from theft or loss and in protecting participant confidentiality. All hard copy documentation of the focus groups, including focus group cover sheet

(documenting the school, date, time, number of participants, participant age, and age of children) is locked in the academic office of Dr. Sheila Shaibu. Parts of one of the parent focus groups were conducted in Setswana and required translation into English by a native Setswana speaker who was also fluent in English. The transcribed focus group sessions were transcribed into Microsoft Word documents by a research assistant, after which, the audio recordings were erased.

Data Analysis

This was the first use of qualitative descriptive methods to provide insight into the perspectives of adolescents and parents in Gaborone, Botswana regarding diet, physical activity, body size, obesity, and potential obesity treatments. In order to remain true to the participants' own perceptions, a low-level, non-abstract, and direct interpretation of the focus group data was utilized. This direct description of study data was conventional content analysis(37, 41, 42).

The objective of this analysis was to gain an understanding of the cumulative narrative of the adolescent and parent participants in as close to their own words as possible, to ensure that original meaning is kept throughout(37). To this end the specific codes were generated directly from the participant comments.

Additionally, the theoretical underpinnings of this research study and subsequent data analysis were rooted in an understanding of the NT and EST in organizing and explaining the influence of multiple, multidimensional factors influencing obesity and its meaning. For example, one's perception of the meaning of body size is influenced by social constructs (e.g., thinness equates with HIV infection), cultural constructs (e.g., larger body size signifies health, strength, wealth, respect, and beauty), and individual

meanings (e.g., overweight and obesity status influence dissatisfaction with current body size; large body size increases individual risk of chronic disease). Additionally, the social, community, cultural, and individual constructs and meanings of diet, PA, body size, obesity, or potential obesity interventions may be influenced by changes incorporated in the NT. Together the NT and EST provided theoretical underpinnings for identifying and categorizing themes, as in the main objective of describing participant perspectives in a consistent and clear manner.

ATLAS.ti 7 Qualitative data analysis software is a robust platform that allows researchers to complete Level I and Level II coding in a dynamic, fluid, and straightforward manner. Level I coding involved dwelling with the research data and in performing a line-by-line analysis of participant comments. Level II coding included grouping or clustering analogous data points into broader categories. These broader categories formed the description of participant perceptions.

Rigor in conventional content analysis began with the questions that were asked as part of the interview process(38). These questions were open-ended allowing the participants to express their own perceptions in their own words(37). Prolonged engagement with the study data and member checking at the conclusion of each focus group increased credibility in capturing and describing the participant's true meanings(38). Next, the researcher used Atlas.ti to highlight quotations, which were the smallest data units in Atlas to which codes could be "attached." Next each quotation was read in order to highlight words and terms that capture the meaning of the whole. The process of highlighting terms was followed by note taking. The notes included initial thoughts about the data aligned with the aims of this study.

These data-driven impressions represented a first-pass analysis of the data and the specific aims of perceptions related to diet, physical activity, obesity, body size, and potential obesity interventions. While taking and revisiting notes, labels related to each of the specific aims emerged directly from the text and became the study codes-thus maintaining the original meaning of answers to the open-ended questions asked during the focus group interviews(43). Analogous codes were then organized into clusters and larger categories based on homogeneity to the study aims. The study goal was to generate ten to fifteen clusters to ensure adequate breadth of data analysis in meeting the aims of this study. In addition to the above stated protocol, credibility of the data analysis was ensured through prolonged engagement, peer debriefing, and mentored debriefing using de-identified data(37).

Applying the aforementioned approach to data analysis occurred systematically according to the research aims and aim-generated questions found in the focus group guides.

Major concepts of the primary aim and related open-ended research questions are as follows: [Question #, CONCEPT: Adolescent Focus Group Question (*Parent Focus Group Question*)].

[Question 1, DIET: Let's start by going around in the circle and each of you sharing with us what you think is the most desired diet. (*Let's start by going around in the circle and each of you sharing with us what you think is the most desired diet for your child*.)]

[Question 2, DIET: Sometimes there are things that make it hard to have a healthy diet all the time. What are the difficulties to eating a healthy diet everyday? (*Sometimes there are things that make it hard to have a healthy diet all the time. What are the difficulties to*

eating a healthy diet everyday for your child?)]

[Question 3, PHYSICAL ACTIVITY: Let's now talk a bit about physical activity. When we say physical activity we mean *any* activities that go beyond an individual's baseline light-intensity activities of daily living. What do you think about physical activity in your life? (*Let's now talk a bit about physical activity. When we say physical activity we mean any activities that go beyond an individual's baseline light-intensity activities of daily living. What do you think about physical activity in your child's life?*)]

[Question 4, BODY SIZE: Now I will show you some pictures of women/men that have different body sizes, tell me which one each of you think has the most desired shape. (*Now I will show you some pictures of women and men that have different body sizes, tell me which one each of you think has the most desired shape for your child.*)]

[Question 5, OBESITY: When thinking about healthy food and activity choices to prevent obesity, what are the most important things that affect your decisions? (*When thinking about healthy food and activity choices to prevent obesity, what are the most important things that affect your child's decisions?*)]

[Question 6, OBESITY INTERVENTIONS: We are thinking about organizing a health program to help kids in your school prevent obesity. In designing a program to prevent obesity, what do you think are the most important things to do? (*We are thinking about organizing a health program to help children in your child's school prevent obesity. In designing a program to prevent obesity, what do you think are the most important things to do?*)]

[Question 7, CREDIBILITY/CLARIFICATION: Would anyone like to share anything else about diet, body size, or health? Please share anything that you think is important

for me to hear to understand the general practices in your community? (*Would anyone like to share anything else about diet, body size, or health? Please share anything that you think is important for me to hear to understand the general practices in your community?*)]

Procedures for accomplishing data analysis for each concept were systematic and direct. Participant responses specific to research concepts of interest (e.g., diet) generally followed questions about those concepts as directed by the focus group guide. Utilizing the focus group guide as a framework for understanding the process by which the transcribed data were obtained, the researcher dwelled (e.g., thorough reading of each focus group transcript) with the data over a prolonged period of time. Dwelling entailed reading, re-reading, analyzing, intuiting, and thinking about the data and its meaning(38). As the fluid process of dwelling continued, topics, ideas, and meanings were identified within the data and reported as themes. These themes formed the first level codes of data analysis, and were worded as close to the participants own language as possible. Next, analogous level I codes were collated, forming level II clusters. These clusters, or groupings of analogous themes mirrored the participants' original meanings and language. These interrelated-clustered themes provided a rich and exhaustive description of the participants' perceptions of the concepts of the primary aim(38).

Analysis of the exploratory objective followed the same analytical steps as the analysis of the primary aim (e.g., dwelling, discovering themes, & clustering themes) with the addition of exploring theories about any similarities or differences that might exist between the adult and adolescent perceptions of adolescent body size as reported by adolescents, and the adult and adolescent perceptions of adolescent body size as

reported by adult-parents of adolescents.

CHAPTER 4: RESULTS

Adolescent perceptions regarding diet, physical activity, and obesity are influenced by three main contexts: time, place, and company. Within the context of time, the rigid schedule of the school day and school/work week as well as the relatively unstructured schedule of the weekend influence adolescent health decisions on a daily and weekly basis. Additionally the change in seasons throughout the year and corresponding heat or cold weather effect the health decisions of adolescents.

Time is interrelated with both place and company. Time and social expectations dictate where (the place) adolescents may be found during the day, week, and year. Generally, adolescents enrolled in school will be located in one of three main locations: home, school, or the shopping mall. Closely related to the place where an adolescent can be found is with whom the adolescent will be found. Adolescents are generally at home with family, at school with peers and school personnel, or at the shopping mall with peers, family, or both.

The adolescent perceptions of diet, physical activity, and obesity are relatively consistent across time, place, and company, however, the ability of adolescents to act according to their perceptions and preferences differs within each context based on availability of food and facilities for PA, and social influence. The contexts and perceptions related to the adolescents of this study are captured in Figure 1.

ILLUSTRATION 1: Social Ecological Model of Adolescent Obesity in Gaborone, Botswana

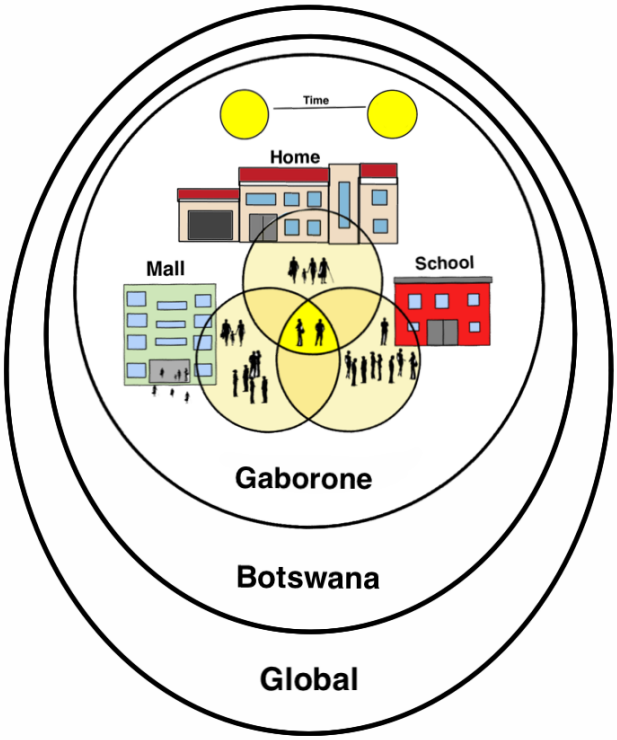


Figure 1.
Individual adolescents-Intrapersonal level (Taste preferences, PA preferences, body size preferences, knowledge about obesity, genetics**)**
Time-Day, week, year.
Home-The home food environment (Caregiver feeding styles)
Mall-The community and consumer food environments (restaurants and markets)
School-The school food environment (school café, tuck shop)
Company-Family, peers, school personnel
Gaborone-Urbanization, local social norms, local laws, the built environment, social meaning of disease, local prevalence of disease
Botswana-Culture, social structure, economic and infrastructure development
Global-Globalization, western food imports, international social media influence

The Context of Time

Adolescent health decisions occur within the context of time. Time can be conceptualized as day, week, and year. The context of the day includes the structured daily routines common of school-attending adolescents. These routines include before school activities, in-school activities, and post-school activities. Before school activities include arising early in the morning, readying oneself for school, consuming breakfast, and transportation to school. In-school activities include class attendance, lunch and snack breaks, and the potential of physical education classes. Post-school activities include school sponsored or club sports, transportation home or to alternative locations, snack time, homework and chores, time with friends, dinner, television (TV) and Internet time, and family time. Similarly, the context of the week captures the highly structured school week as well as the relatively unstructured weekend wherein adolescents have increased individual freedom to construct their own schedules and pursue individual preferences for food and activity. Regarding increased time and autonomy on weekends one female participant stated that,

> Personally is very hard for me to find time like okay, you wake up in the morning like during the week you wake up in the morning you come to school, you go home late and immediately clean or read or something. And after that the time; you get home at four and then around maybe eight you eat so focusing on things like your time table, I am always busy and it's like only during the weekends that I have time.

Additionally, time measured throughout the year effects health decisions due to the relatively extreme seasonal variability in temperatures during the cold of winter and

extreme summer heat. The temperature extremes tend to have a negative impact on the preferences for outside activities among adolescents. When asked about barriers that might prevent PA throughout the year, two male participants stated that "like now in winter because it's kind of cold," because "some of us don't like the cold." Additionally, parent participants stated that PA in the summer heat puts adolescents at risk for dehydration because they do not realize how much water they are losing through sweating, and become too involved in the PA to drink sufficient water. When asked about why the summer is a concern parents stated that "the heat in Botswana" "it is a problem." "Even if there's so many bottles of water but they get too involved in what they are doing and they don't drink, they drink when they are really too thirsty and that's too late I think."

The Context of Place

The place where adolescents are physically located, whether at home, at school, or at a shopping mall, influences the health decisions of adolescents through the dietary or activity options available in each location. At home the adolescent is influenced most heavily by parents and other family members and is exposed to the foods, activities, and perceptions of obesity supported by the family in the home environment. This is the location of most limited choice for the adolescent and of greatest parental influence. An adolescent female stated that she chooses to purchase fizzy drinks outside of the home because of in-home restrictions. She stated that she and her friends "go for fizzy ones because juices when we are at home our parents mostly buy juices so you will rather say 'ah, let me buy a coke' or something like that."

Additionally, the foods available and activities promoted at schools play a role

in adolescent preferences. While at school adolescents have increased freedom to make individual food and activity choices, relative to the home, but choice is still finite and limited by the available foods and physical activity programs. A female adolescent shared that the foods that are most healthy, those found in the cafeteria, are not her top choice. She stated, "the food that I don't want at all is the cafeteria food." So instead of purchasing foods from the school café, the students purchase snacks and lunches from the school tuck shops where "you'll find more junk food than you find more healthy food like sandwiches and juices..."

When adolescents are at one of the local malls or analogous shopping centres, they are influenced within the context of limited choice of activity and almost unlimited dietary options. Additionally adolescents have maximum autonomy in making diet-related choices in that environment. A parent participant stated that the shops at the malls or shopping centres offer many unhealthy, "processed foods which are commonly found in the shops today."

Similarly, a parent participant when asked what her child eats outside of the home reported that her child commonly consumes non-traditional foods "… when they are out there they go for the KFC and Nandos thing."

The Context of Company

Interrelated with the contexts of time and place is the context of company, or with whom the adolescent is associating with socially. Adolescents are influenced through direct association with three main groupings of social contacts: the family (at home), peers and school personnel (while at school), or a combination of peers and family (at malls). While adolescent preferences are relatively consistent across time and place, the

perceived influence of individuals and groups affects their health behaviors. When asked about the effect that her friends have on her dietary choices a female adolescent said that "for example when you are a group of friends and you are eating your healthy meal of like green salad and then everybody is having like pies, fizzy drinks, people will be looking like 'Wow! Wow! Eish!"

Similarly, another female adolescent stated that even the social influence of peers at school influence her to make unhealthy dietary choices. She stated that "I think just being around school at all like even if you pack your own healthy lunch you still you see people walking around with pies and sweets and Rolly Pops; you are like you know what this could be the lunch and then go to the tuck shop and then have you know."

About Those Adolescents

Interwoven with the contexts of time, place, and company, adolescents shared their perceived understanding of, preferences for, and influences related to obesity, diet, and physical activity. Additionally, the adolescent focus group participants expressed perceived obstacles to healthy eating and PA and methods they perceived as most important in establishing an adolescent obesity prevention program.

Obesity and Body Size

Adolescents understood the meaning of obesity and identified many obesity related chronic health conditions as well as negative characteristics and undesirable outcomes they associate with obesity. When asked about the meaning of body sizes representing obese individuals an adolescent stated that "number 10, especially ranges from number 7 to number 10, they are likely to have diseases like heart attack, stroke."

Additionally, adolescents perceive the most desirable body size for themselves

as being one of normal body size and weight because it is more attractive, easier to use public transportation (small micro buses and vans), and easier to participate in physical activities. Female focus group participants specifically suggested that while they preferred a healthy body weight, they also wanted attractive feminine bodies with curvy "African hips," so that they can

"…be able to wear nice clothes…"

Interestingly, both male and female focus group participants suggested that members of the opposite sex should not be obese but could have fuller figures representing femininity or masculinity, respectively. Male focus group participants stated that females should have hips and curves, which represent an attractive African woman's body. One male adolescent suggested that a curvy woman's body was desirable for tactile reasons because it gives you "something to hold on [to]."

Similarly, female participants suggested that their preference of male body size includes a fuller figure. These female participants stated that the fullness of the figure represent a strong, muscular body. One female adolescent stated that a slightly fuller male body size "…looks nice and strong."

Interestingly, the adolescent focus group participants assigned conflicting characteristics to larger body shapes. They stated that longstanding weight related cultural perceptions of obesity are still espoused by family members and others in Botswana. These historical cultural perceptions suggest that obese individuals are wealthy, strong, advancing in their careers, and attractive. When asked if his parents would support obesity prevention interventions, one male participant stated that his parents would not support the prevention measures because, "for me I think they won't

like it, I mean they will hate it because they've been encouraging me that a person who's fat is the one who will become rich when he grows up."

Conversely, the perceptions adolescents relate to obesity suggest that obesity is associated with negative characteristics like laziness, loneliness, and embarrassment. When asked about the social implications of obesity for adolescents, an adolescent female stated that obese peers are singled out for because "…usually when they are around this from 6 to 10 when your body is this big you are more, as an adolescent you are more, you are going to be teased like you are likely to get your feelings hurt….they are going to tease you because you have grown too fat, they isolate you."

While too much weight is perceived by the adolescents to be negative, too little weight can be equally negative. This is due to a social perception that thinness and rapid weight loss is linked with disease, especially HIV infection. One male adolescent summed up the social perception of thinness and disease by saying "…most people don't see people who are skinny as good people they consider them to be ill sometimes, sometimes when they see someone who is skinny they may say that person is sick some may even say some are HIV positive just because they are skinny, they don't have too much weight."

While the general social perception is that weight loss equals HIV infection, it is interesting to note that adolescents are able to differentiate between healthy and unhealthy weight loss based on purpose. They view individuals who purposefully lose weight to increase attractiveness or for health benefits as engaging in healthy weight loss. Conversely, unplanned or extreme, rapid weight loss is viewed as unhealthy and related to stress, anorexia, disease generally or HIV infection specifically. Additionally,

adolescents suggest that healthy weight loss is accomplished through conservative and healthy changes to diet and activity. When asked about what weight loss means, a male adolescent stated, "It depends on your size….if you are fat, its okay to lose the weight but if you are skinny no.…and if you lose your weight too much and when you are fat and you lose your weight too much it won't be good….they [peers] think you'll be skinny."

Similarly, another male participant, when asked about the meaning of weight loss, stated, "weight loss is good as long as you don't lose too much weight because losing weight can help in many ways because it can help like with your heart, the blood flowing in the vessels if you have more weight then its not good for your heart because you'll end up having heart attack so weight loss reduces the chances of heart attacks and strokes."

Obesity Prevention

Adolescents state that obesity prevention and healthy weight loss are cool, desirable, and lead to better health. The adolescent participants suggested that physical activity, a balanced diet, and personal determination are required to maintain or improve ones health. When discussing what is required for healthy weight loss, a male adolescent stated that, "if you want results you have to work for them….nothing is easy in life you know."

Similar to the general acceptance of obesity prevention the adolescent participants stated that they would accept a school-based obesity prevention program. They said that such a program would be "cool," important, and that they would generally like to participate. They also offered items that would persuade or dissuade them to participate in a school-based obesity prevention program.

According to the adolescent focus group participants the most important and

attractive components of a school-based obesity prevention program would include incentives for participation, entertaining educational activities, increased options for physical activity, and increased availability of healthy offered on campus.

Regarding incentives for participation, several participants suggested that monetary and other rewards be provided for participation in the school-based obesity prevention program. When asked what types of incentives might be appealing a female participant stated that a cell phone would be a proper reward for successful participation. "Something cool, maybe they say 'the person who has lost weight this first week maybe wins a cell phone with a camera."

Similarly, many participants seemed familiar with weight loss competitions on television and suggested that monetary rewards be provided as part of a competition among students competing against each other within the same school or between neighboring schools. One female adolescent was adamant about receiving some type of reward for participation similar to what is seen on TV. She stated that,

> Really the fact that making shows; that's why these people make shows because they know that people like money. Just pouring an amount of money and then you say 'if you do really lose weight, you will win this amount of money, people really get entertained. Right now if you tell me to lose weight and you don't give me anything, ah!

The adolescent participants strongly suggested that the educational component of any school-based obesity prevention intervention include fun and interactive educational lessons. The adolescents suggest that the lessons deal with knowledge deficits related to healthy eating, physical activity, and obesity generally. The program, according to the

participants, must be advertised to the students in an interesting and fun way. Additionally the participants stated that if the educational component was presented to them as part of a lecture they would disengage and choose to not participate. When asked what the educational component should be like, a female adolescent expressed that those doing the educating need to create an interactive learning environment; that "…they have to interact with us because if they just talk to us we are not really going to pay attention, they have to interact with us and keep us interested."

Obesity Prevention and Physical Activity

The adolescent participants stressed that increasing the number of sports, clubs, and opportunities for physical activity was important. For the adolescents, physical activity was perceived specifically to be important in preventing obesity, being healthy, and becoming strong. Interestingly, while some participants desired competition among individuals and groups, others suggested that limited spots on competitive sports teams and competition in general might be a reason some students are not currently engaging in enough physical activity. When asked what might prevent adolescents from being physically active, one adolescent stated that "I think also like an important thing is because we have like a lot of sports here but also I think like they teach us especially like more concentrate on beating other schools kind of so, I know like some people that want to play they don't really get to play." Another adolescent shared competition in general is a barrier to participation. This participant stated that "the thing is everybody wants to win; anyone takes this and this'; I just don't understand why we can't just do physical activity but it doesn't have to be always about winning."

Non-competitive sports should be added to the already planned activities and

athletics at schools to allow for increased PA without the barriers related to competition. When discussing the effect of limited competition, enjoyment of PA, and participation in PA, one adolescent stated that "…soccer was nice last year because it wasn't competitive but we still played."

The non-competitive sports and physical activities should be interesting and varied to stimulate student interest. An increased variety of sports and physical activities will cater to a greater number of students and will mirror the wide variety of physical activities that adolescents said they like. These desired PA's include: swimming, jogging, soccer, rugby, biking, walking, and netball to name a few. When asked about PA options that should be added, one adolescent stated that,

> Because like I think like lets say for the healthy for the like physical activity, you should like bring in like more sports or like more physical activities that we don't have and stuff that we like better because sometimes we always talk about like bringing more afternoon activities for us to do because there are just ordinary ones like basketball and tennis and soccer.

The Who, When, and How of Obesity Prevention for Adolescents

Some adolescents felt that the school-based obesity intervention should occur outside of regular school hours (during the summer, holidays, or on weekends), however the majority felt that the program should occur during or immediately after school. Additionally, there were some adolescents who felt that only those who are currently overweight or obese should be invited to participate. The majority of the adolescents disagreed with that approach, and instead stated that the program should be open for all students since all would benefit. Interestingly, while some participants said that the

program should be mandatory, there was strong sentiment that the school-based program should not be compulsory in nature. Additionally, the adolescents admitted that a non-compulsory program might lead to poor participation among the student population. The adolescents felt that while the program would benefit all students, if it were a mandatory program for all there would be resistance from students. This is due to students feeling like they can't "do what they want" or that they are "told what to do." When asked why the program should be optional and not mandatory, a female adolescent said "because when you're forced to [do] something you don't like, you really start to resent it; always make it optional, always." Another female adolescent seconded the message of the first by saying, "the worst thing to do is to force people because then they're going to rebel against you hard, especially teenagers."

Obesity Prevention and Diet

Similarly, the adolescent focus group participants stated that while they would like an increased variety of healthful foods offered at school, they would not want the unhealthy foods removed altogether. This is extremely interesting as seen within the context of the adolescents' dietary preferences and health awareness. The adolescents correctly identify healthy versus unhealthy foods. They know that the traditional foods of Botswana as well as fruits and vegetables are healthy and should be important components of their individual diets. Additionally, the adolescents correctly identify as "junk foods" the non-traditional and industrialized foods available in tuck shops at school or in fast food and other restaurants outside of school (chips, fresh chips, fast food, KFC, Nandos, fizzy drinks, ice cream, cheese puffs, chocolate, and pies). The troubling aspect of this correct knowledge of healthy versus unhealthy foods is that the adolescents

prefer the unhealthy foods as the most desirable part of their daily diets. Additionally, they acknowledge that the foods they desire and consume on a regular basis, daily in some cases and weekly in most, are the same foods that they label as junk foods. And in terms of the traditional diet of Botswana, the adolescents viewed it as unappealing, not as "nice" or palatable as the non-traditional diet, and indicative of being "poor." This is an expression of the adolescent taste preferences for non-traditional, energy-dense foods. When asked about what a healthy adolescent diet would consist of, a female adolescent stated that, "…most foods in Botswana I actually believe that they can make go into this healthy diet because most of the Setswana foods are healthy like sorghum and all that." When asked what it would mean socially to consume healthful foods instead of junk foods a male adolescent said, "its just the teen mentality if people are eating pies and am taking a banana it makes us look poor or something."

Additionally, a non-traditional diet of pies, fizzy drinks, and other junk foods was perceived as synonymous with wealth and fitting in with peers. Those perceptions negatively affect dietary choices among adolescents. A female adolescent shared her personal feelings about consuming traditional foods in the cafeteria and the pull to consume the same foods as her peers. She shared her conflict related to choosing healthier food options at school rather than the unhealthy tuck shop foods. She stated, "because you feel like an out cast because you are the only one that goes to the cafeteria so you have to get money and go to the tuck shop."

Additionally, the adolescent participants voiced the idea of partially subsidizing the cost of healthful foods, in order to make them less expensive and more appealing financially than unhealthy foods. Similarly, the cost of unhealthful foods would be

increased to make those foods more expensive. This notion comes out of the perception that healthy foods cost more than junk foods. Interestingly, the adolescents did not want the unhealthy junk foods banned from the school tuck shops or cafeterias, instead they wanted to level the cost differential between healthy and unhealthy foods and maintain choice. When asked about what could be done to facilitate healthy eating at school a male adolescent stated, "yeah cost we said that some of these nutritious foods are produced locally here in Botswana so the government could subsidize the price." When asked about replacing unhealthy foods with healthy foods a female adolescent stated, "there is one thing you cannot remove, pie."

Obesity Prevention and Perceived Social Support

The majority of adolescent participants voiced support for a school-based obesity prevention program and for obesity prevention generally. The adolescents stated that those around them, from family, to friends, to school personnel, to role models, community leaders, and even celebrities might influence their participation in obesity prevention activities.

In terms of perceived family support for adolescent obesity prevention, there are two competing groups. The first group consists of parents and family members who the adolescent perceives as being supportive of healthy behaviors and obesity prevention. These parents would not only support their adolescent in managing their weight but would likely join with them.

When asked what his family would think about obesity prevention and weight loss, one adolescent male stated, "for me they will love me to lose weight because in my family they like active children." Additionally, a female adolescent shared similar views of

family support when asked about their reaction to obesity prevention and weight loss, "for me, they will approve me very much because they have long wanted me to lose weight."

The second and competing group consists of parents and family members who adhere to the historic cultural norm that associates obesity with wealth, strength, social status, and beauty. The adolescents who perceive their parents reacting negatively towards any obesity prevention program feel that they would not be supported. In some cases the adolescents perceived their parents as becoming fearful that their child demonstrated signs of HIV illness, would not be perceived as wealthy, and would not have a traditional strong body style. When asked what his parents would think of an obesity prevention program and weight loss, one adolescent male stated, "for me they will become concerned because in my culture big people are considered to be strong." When asked the same question, another adolescent male stated, "for me I think they won't like it, I mean they will hate it because they've been encouraging me that a person who's fat is the one who will become rich when he grows up."

Similarly, adolescents perceive friends first reactions to obesity prevention behaviors including healthy eating in positive, neutral, or negative ways. The friends will automatically accept the healthy behaviors, not care at all, fear the adolescent is ill with HIV, or tease the adolescent. Similar to the perception that weight loss accompanies HIV infection, the very act of eating healthily is perceived to raise suspicions among friends of possible HIV infection. When asked how friends would respond to healthy eating as part of obesity prevention, one adolescent male stated that, "I think they'll hate it I mean they'll think that I am going mad or I am sick [or] something because someone who

mostly people who are sick are the ones who are advised to eat healthy foods."

Interestingly, many adolescents who originally stated that their friends would ridicule and not understand their healthy choices would eventually support the adolescent with some friends adopting the same behaviors. When asked what friends would do when they saw healthy behaviors, one adolescent female stated, "yeah, seeing you walking all the time, eating a fruit every day, is a surprise to them; after sometime they get used to." Another female adolescent shared a similar perception of friend support when she said, "well I think my friends they'll think it's like a bit weird but after a while maybe they can encourage me yeah."

School personnel and community leaders are perceived as being supportive of adolescent obesity prevention. They are perceived to view obesity prevention among the adolescents as being important for the adolescent health as well as collectively for the health of the nation. Similarly, celebrities like Oprah, Tyra Banks, and professional soccer stars like Ronaldo are perceived to be positive role models for healthy behaviors. Several adolescents stated that they were first informed on the subject of obesity due to the work of Oprah and Tyra Banks. When asked who would be considered a role model of healthy behaviors one female adolescent stated that,

> I first learnt about obesity at Oprah because she's my role model, so I heard about obesity teacher talking about it in America and I didn't know what it was because I've never heard it in Botswana; I swear I've never heard it in Botswana. I have always said if it wasn't for Oprah I would have never known what obesity is not even in school.

Adult Perceptions of Adolescent Obesity Prevention

Parents of school attending adolescents expressed their perceptions about adolescent obesity prevention. The parental perceptions provide insight into the obesity related health decisions of adolescents. Additionally, these perceptions describe the way in which parents might help to prevent or promote obesity among adolescent children. Based on the perceptions of parents of adolescents, there are conflicting sentiments related to adolescent diet, physical activity, and obesity prevention.

Parental Perceptions of the Meaning of Obesity

Parents feel conflicted about the meaning of obesity. Traditionally, in African and specifically Botswana culture obesity is associated with health, strength, wealth, and social status. When shown body size silhouettes and asked to identify meaning, an adult participant stated, "…when a man is promoted he becomes this [obese] size". Because of the cultural meaning of obesity parent participants stated that it is difficult for them to reconcile the ingrained cultural meaning of obesity with the newer information about the dangers of obesity. These conflicting messages leave some parents unsure about which obesity related message they should follow. In discussing the conflict between the scientific and culture meanings of obesity, one parent stated,

> In African they have been spending so much time trying to put on the weight but it looks they get used to it, now you turn and do the other way….no wonder people are confused; they don't know anymore what's the right thing.

The parent participants all seemed to support the new interpretation of obesity as being risky for health. They also believed that it is important to prevent obesity among adolescents and voiced support for school-based obesity prevention programs. Similar

to the reaction of adolescent participants, these adults stated that obesity prevention is cool and needed. Additionally adult focus group participants stated that they would not only support their children in preventing obesity but that they would become involved in the process as well. Adult participants suggested that parents should be involved in any school-based obesity prevention program. Additionally, they stated that "responsible parenting" should be included as part of the program because change "does come from home." One parent participant stated, "I would like to run a workshop at no cost at Sir Seretse Khama (school) for parents whose children were born from the year 1996."

Adult Perspectives: Diet and Obesity Prevention

The adult perceptions of the adolescent diet are complex and conflicted. The adult focus group participants stated that the diet they most desired for their adolescent children consists of healthy foods like vegetables, fruits, whole grains, and traditional foods. Additionally, adults identified non-traditional and highly processed foods as unhealthful and undesirable. These foods include "sweets", "sugar, ice cream, chips, fresh chips as well cheese puffs, sweet food Cakes" and "fizzy drinks."

Even though adults identify healthy foods as desirable and unhealthy foods as undesirable, their preferences do not always correspond to real day-to-day dietary choices. Difficulties identified by adults in providing a healthy diet for adolescent children include a lack of time, feeling disorganized, low availability of healthful foods, and indulgent caregiver feeding habits supporting unhealthful eating at home. Adult focus group participants stated that they commonly provided unhealthy foods to their children in spite of knowing that those foods are least desirable. The reasons expressed for doing so are related to offering "comfort" to children, as a means distracting children after a

tiring day of work, and to satisfy the child's taste preferences for "nice" foods. When asked about the food provided at home parents suggested that they were highly responsive to their children's food requests. One parent noted the main reason children request unhealthy foods, "now our children do not like boiled chicken, they think it is not tasty they say it is not nice, they like fried chicken instead. They do not want to eat traditional foods…" Similarly, another parent added the rationale for indulgent-like responsiveness to food requests, she said, "this is the reason why when they ask for certain foodstuff we buy them so they are satisfied even we know that the food is unhealthy." Another focus group participant acknowledged adolescent dietary preferences based mainly on taste and similarly acknowledged negative responses to healthy food offerings at home. Regarding taste preferences and healthy versus unhealthy foods, one parent said, "this less fatty and less sugary things they are very healthy but people don't like them." Similarly, another parent stated,

> I have noticed that some, at times people do not really accept the changes because what I have noticed is healthy food doesn't really taste as nice as unhealthy foods, so when you start introducing brown bread you know people will frown, brown mealie meal, brown rice, vegetables with peanut butter, the reactions are not very encouraging

Similarly, adults perceive that parents influence their children's dietary habits. Parents perceive that they have modeled and pressured their children to overeat, which may lead to increased obesity risk. Pressuring children to overeat is perceived to be commonplace and begin at a very young age. One participant suggested that parent influence pressuring overeating, starting at an early age is part of the problem. She

stated, "…we tend to teach our children as well from their babies to eat too much."

Additionally, difficulties in consuming a healthful diet outside of the home were identified as peer influence, social influence, and an unhealthy school food environment. Peer influence outside of the home is perceived to lead to consuming non-traditional and unhealthy foods. Similarly, social influence leads to the consumption of non-traditional, highly processed, unhealthy foods because they are associated with social status and wealth. Additionally, the school-food environment supports unhealthy eating in similar ways through the convergence of social and peer influence. When discussing peer influence on diet, one parent stated,

> But I find that there's a lot of discussion among the girls at least in my daughters group. They all want to go to the tuck shop and they she's asking me everyday to have money with her and I say no because I know she's not eating her lunch packs….but I often find it on top when I come back then the friends that had money with them took her to the tuck shop and she's just been eating crap and then she's extremely hungry when she comes back home.

Similar to the social pressures experienced by adolescents, adults perceive social pressures that affect dietary choices for themselves and their families. Interestingly, the social pressures revolve around the perception that purchasing and consuming non-traditional foods is associated with wealth and social prestige. When discussing the role of social pressure in providing healthy foods for adolescents one parent stated, "also people must be happy to see what I eat, I must show that I belong to that class of society who can afford certain things in life."

Additionally, parents perceive their children's response to healthful eating as a

sign of worsening finances in the family. One parent stated that her children would view a shift from unhealthy to healthy foods as sign of financial woe when she said, "yeah some of the for example this our children they might think there is something wrong within the family, mummy and daddy they can't afford anymore to buy for us so there is something wrong financially, what's happening?"

Conversely, adults perceive that traditional foods do not carry the same prestige or social status. Adults perceive traditional foods as being synonymous with rural life, poverty, and unsophistication. One parent participant stated, "Setswana food[s] are eaten by rural people who are less sophisticated and 'developed', with the more sophisticated people residing in town."

The socially driven bias against traditional foods in favor of non-traditional foods is unfortunate because consuming traditional foods is perceived to make weight maintenance easier. When discussing which foods are perceived as healthiest for adolescents, one parent participant expressed displeasure in the fact that in her opinion people were abandoning traditional foods. She said,

> I was saying that a little earlier I was talking about the kind of food that we as Africans, we have really neglected them, we have lost touch with them. With these foods it was not necessary for people to induce weight loss through cutting down food intake.

Adult Perceptions of Weight Loss

Adult focus group participants share an accurate view of adolescent energy equilibrium related to weight loss. They feel that the amount of food that adolescents consume should be commensurate with the energy requirements of that adolescent

based on his or her individual physical activities and overall energy needs. When asked about how much food should be in a child's diet, one parent stated,

> okay also I think the quantity should also go along with the activity that the child does….if the child is very active obviously you have to include more carbohydrates; if the child is not very active obviously you should cut down on carbohydrates.

Additionally, adult participants perceive the meaning of weight loss as "good" or "bad." If weight loss occurs in response to underlying illness then it is undesirable. Conversely if weight loss occurs through purposeful changes in dietary and activity behaviors then it is acceptable and desirable. When discussing the meaning of weight loss, one parent stated, "Through sickness is not good. But if you lose it through exercises and then maybe you change your diet, that one is good."

Longing for the Traditional Way of Life

Adult participants reminisced about the lifestyles they lived when they were young and compared their memories and experiences with what they perceive as the lifestyles of their children. The lifestyle patterns that, according to the adult participants, changed the most are related to the traditional diet and physical activities. In terms of the traditional diet participants feel that they have "neglected" and "lost touch" with traditional foods. Similarly, participants feel that physical activity patterns have changed dramatically. Gone are the days of rigorous daily physical activities associated with maintaining a rural life. The urban living children of these adults, unlike their parents, do not have to perform daily manual labors as part of daily living. The physically taxing chores that adolescents are no longer expected to complete include carrying water,

working with crops, and in gathering the necessary supplies for daily living. In place of strenuous daily activities adolescents are perceived to spend their time on Facebook, sitting too much, and watching Television. When discussing the change in physical activity over time for adolescents, one parent stated,

> A lot of work that a Motswana carried out in the past required some physical activity or manual work almost all the time, such as fetching water from distant places from homesteads (buckets on ones' head), or pounding crops for extracting sorghum seeds for instance during harvesting season, fetching firewood, that is every activity involved some form of physical activity…It is just that they have not looked after domestic animals.

Additionally, adults perceive mechanized transportation as another way adolescents have lost touch with the past and have settled into a less physically demanding present. Adults perceive the adolescents as lazy and entitled to be driven from destination to destination.

When asked about adolescent physical activity, one parent stated, "yes, they are just 'spoiled', they want to drive or ride a car even if the place of destination is not too far." Another parent also noted the expected use of cars for transportation and what it means when you don't have your own car when she said,

> That one I think the problem is that the lives we live, you wish you can tell the kids lets do this [exercise], but because they grow up in an environment where cars are the mode of transport, children get the impression that if they walk it is a sign of….suffering.

SES, Diet, and PA

Adolescents and adults suggested that SES or the perception of SES plays a role in health choices related to diet and PA. External influences related to SES include the healthfulness and availability of foods at school. Additionally availability of PA offerings in schools, including the quality and access to playing fields and a variety of sports seems to differ based on the SES characteristics of the school itself (i.e. no-cost public school). One of the high-cost private schools had already undergone a change in the foods offered to students at school. The cafeteria and tuck shop replaced the unhealthy foods with healthy offerings. This was not the case with moderate-cost private schools or no-cost public schools, where unhealthy foods predominate. Additionally, adolescents attending private schools reported higher access to school sponsored and club sports, while students at one of the no-cost public schools complained that athletic fields were in disrepair and accessibility in general was limited due to lack of school personnel for supervision.

Internal influences related to SES and dietary choices center on possible social perceptions. Adolescents and parents of adolescents suggested that the foods you purchase and consume denote your social standing. Adolescents described eating traditional foods as being synonymous with being perceived as poor. One adolescent stated that non-westernized foods are viewed negatively compared to westernized foods. He stated that "…if people are eating pies and am taking a banana it makes us look poor or something." This is similar to a parent who stated that she feels pressured to purchase unhealthy-westernized foods, inferring that if she doesn't she will be perceived as being part of a lower SES group. She stated, "…I must show that I belong to that class of society who can afford certain things in life."

CHAPTER 5: DISCUSSION

The findings of this study suggest that multiple factors influence adolescent health behaviors, dietary and PA preferences, body size preferences, and perceptions related to obesity and obesity prevention for school attending adolescents in Gaborone, Botswana. These factors represent multiple layers of influence related to the development of adolescent obesity and are captured through the use of a Social Ecological Model (SEM) based in the Ecological Systems Theory (EST) facilitates the conceptualization and study of multiple factors associated with obesity development(4). The SEM is a modifiable framework that allows for a culturally sensitive description of many of the etiological factors of adolescent obesity(44, 45). This description includes a broad view of factors ranging from individual factors to those outside of the individual such as family systems, social systems, and other macro-level factors that influence individuals(45, 46). Additionally, the SEM allows for the development of culturally appropriate obesity interventions that take into account participant preferences as well as potential barriers to its success(4, 47-49). Obesity interventions utilizing the SEM to affect change on multiple levels of influence, from intrapersonal to global, have the highest likelihood of success in increasing PA and healthy dietary changes in target populations(50).

The SEM is modified to fit the findings and cultural foundations of this study and includes factors at the intrapersonal level (i.e. taste preferences, PA preferences, body size preferences, knowledge about obesity, genetics), the interpersonal level (i.e. parent and family influence, caregiver feeding styles, peer influence, school personnel influence, social media), the local level (i.e. Gaborone: urbanization, local cultural norms, local

laws, the built environment, the school food environment, the consumer food environment, social meaning of disease, local prevalence of disease), the national level (i.e. Botswana: national laws, economic development, national cultural norms, food importation regulations, national prevalence of disease), and at the global level (globalization, westernization, multinational food industries, global media, the internet) (see Figure 1).

Intrapersonal Influences

Adolescent focus group participants expressed intrapersonal influences, or individual preferences, that put them at risk for the development of obesity. These intrapersonal influences represent adolescent perceptions regarding diet, body size, obesity, and weight loss.

Regarding dietary perceptions, adolescents correctly identified healthy foods (traditional foods, vegetables, fruits), while also noting specific health benefits related to their consumption (reduced risk of: obesity, heart disease, hypertension, stroke). Yet in spite of this dietary knowledge, adolescents described their most desirable daily diet as one containing high energy-dense, non-traditional junk foods (pies, fried chicken, fizzy drinks, and chips). The apparent contradiction between adolescents dietary knowledge and eating behaviors is consistent with western adolescents who see obesity as a problem yet consume foods known to increase obesity risk(51).

Additionally, the preference for junk foods was a consistent theme voiced by adolescents from all study schools. When comparing junk foods to healthy foods like broccoli, Brussels sprouts, and traditional foods, junk foods were said to be “nice” or having a more enjoyable and desirable taste, while healthy foods were said to be “not

nice." The adolescents are describing their intrapersonal taste preferences for junk foods over healthy foods. This transition from plant based, low energy density foods to foods high in added oils and sugars and is related to the innate preference for foods that offer a more palatable experience, higher satiety, and generally have greater sensory appeal(52). The transition from healthy foods to unhealthy yet more palatable foods among adolescents in Botswana is similar to qualitative results of rich urban-living adolescents in Cameroon whose taste preferences have shifted, in the presence of increased availability of westernized foods and sufficient income to purchase those foods, to sweet foods (doughnuts and candy), which are consumed for the purpose of individual pleasure(22).

Interestingly, increased exposure to westernized foods does not necessarily lead to taste preference transition. This is evidenced by a lack of significant taste preference transitions in the Philippines, Malaysia and Indonesia, where westernized foods are perceived to be foods that should be eaten occasionally or rarely, while traditional foods continue to be the main staples of their respective national diets(53). It seems, however that the transition of taste preferences for foods with added oils and sugars has already occurred among adolescent students attending the public and private schools sampled.

Adolescents stated that their preferred body size ranged from normal-weight to slightly overweight based on the body image silhouettes they were shown. Similarly, the perceived most attractive body size in the opposite sex ranged from a normal weight image to a slightly overweight image. None of the adolescents preferred the obese body sizes for themselves or the opposite sex, which is contrary to the historical preference for a larger body size. This suggests that for adolescents the body size norm is that of a

normal body size and body weight. Consistent with that suggestion, overweight and obese urban living adolescents in Botswana are dissatisfied with their body size and weight status as compared to normal weight peers(25). This is also consistent with urban living individuals in Cape Town, SA who rate slender body figures more positively than heavier figures(54). It appears that the adolescents of this study have adopted a more westernized internal perception of body size, similar to adolescent African immigrants in Australia who acculturated to western views of body size and obesity(55).

Similarly, adolescents view thin body shapes and underweight as signs of illness, specifically HIV infection. This association of thinness with HIV may be a reason that body size preferences range from normal weight to slightly overweight. Dissatisfaction with thinness is consistent with findings from two studies from neighboring South Africa where thinness is not desirable and associated with the perception that one might have HIV infection(28, 29).

Interpersonal Influences

Adolescents and parents perceived peer influence as supporting unhealthy eating at school and outside of the home. Unhealthy dietary choices were seen as cool, socially acceptable, and expected by adolescent peer groups. Conversely, adolescents perceived peers as viewing healthful dietary choices negatively. Choosing healthful food options while in the presence of peers was perceived by adolescents as meaning one might have ill health, specifically HIV. This is due to the HIV-specific dietary guidelines to eat healthily. Also, adolescents perceived peers as viewing healthful eating as a sign of lack of financial resources. Adolescents stated that if you had money you would purchase pies, Russian sausages, and other junk foods. Interestingly, even in the absence of

enough money to buy junk foods at school adolescent and parent focus group participants suggested that peers share their limited financial resources with each other so that each adolescent might purchase or consume junk foods. This is similar to the shared spending habits of adolescents in Netherlands, Poland, Portugal, and the United Kingdom, where adolescents pool financial resources together in order to maximize purchases of junk foods that they ultimately share with each other(56).

Additionally, adolescents expect peers to display mixed reactions to their healthful eating. Adolescents expect some peers to initially mock healthful eating while others might demonstrate support or indifference. Interestingly, most adolescents suggested that their peers would eventually support attempts to eat healthily, with some peers changing their diets towards healthful foods as well. Peer social influence can affect adolescent behavior, and may support weight management or weight gain depending on peer health behaviors(57, 58).

According to the adolescent participants, school personnel supported consumption of junk foods in the majority of the schools through allowing tuck shops to sell unhealthy junk foods and in turning a blind eye to the situation. Adolescents attributed the school's profit motive to this situation as well as disinterest among teachers in challenging unhealthy eating. One female participant commented on the profit motive behind the unhealthy foods offered at schools. She stated, "I think because now it's more profitable to buy junk food like in the tuck shop because they know that a lot of people would like to buy pie, chips, whatever." Another adolescent participant noted that school personnel do not seem to care about what students eat while at school. She noted, "honestly you don't find like the teachers saying 'no, you know guys stop eating chips', you know

during lunch and break time people have like 3 Fantas in one day like almost like every day." The perception that teachers were disinterested and schools sold junk foods to students in search of profits was not the case among adolescent participants from one of the private schools. Some unhealthy foods in the tuck shop (hamburgers, doughnuts, etc.) were replaced with sandwiches, fruits, vegetables and other healthy snacks. Additionally, participants from this school perceived teacher support for healthy eating and described the only in-class snacks that are allowed as being fruits, vegetables, and water (instead of fizzy drinks). While the participants noted that initially there was pushback against the changes, the student population eventually embraced them.

Regarding adolescent body size, parents of adolescents suggested that the most desirable body size ranged from normal weight to slightly overweight, similar to the preferences of the adolescents. While there was general congruence between adolescent and parent preferences of body size, the apparent incongruence of some parent's perceptions of larger body sizes, according to traditional beliefs of the meaning of obesity, are supported by the literature. Additionally, some adolescents suggested that their parents maintained a more traditional-cultural view of obesity and body size, while the majority suggested that their parents would support obesity prevention. This suggests that parents may have adopted a more westernized view of body size generally. This is important because even though adolescents have adopted a western view of body size towards that of normal weight, their views may differ from parents who hold to traditional views which can influence adolescent views(55). In a study of body size perceptions of true mother-daughter dyads, mothers and daughters in Cape Town, SA, mothers who perceived thinness as a sign of HIV infection preferred greater body size

in their daughters. This preference was communicated to the daughters and supportive of excess weight(29). A qualitative study of African American mother-daughter dyads found that weight and body size preferences were highly influenced by family and close peers but not as much by influences outside of those close circles(59).

Local, National, and Global Influences

Parents of adolescents and adolescents themselves report that adolescents commonly consume non-traditional foods when out in the community and consumer nutrition environments. Additionally, parents report purchasing non-traditional fast foods for family meals due to lack of time, lack of energy for food preparation, and due to social pressure. This generalized social pressure to purchase non-traditional foods demonstrates a certain level of wealth, social status, and being able to provide nice things for one's family. The pressure to achieve or be perceived as being part of a higher SES class through the consumption of western foods may negatively affect the dietary choices of adolescents and parents of adolescents in this study. In turn this may put these individuals at a higher risk of developing obesity.

Along with changes in dietary options and preferences, the NT captures changes in PA as well. As noted by the adolescents and parents of adolescents in this study, there has been a dramatic shift towards dependence on cars and mechanized transportation, even for short trips. The use of mechanized transportation is positively associated with decreased levels of PA and a hallmark of the NT(1). Most adolescents use public transportation or are driven to and from school daily. In a study of Ugandan young adults, use of taxis and private drivers was positively associated with obesity(60).

The adolescents of this study enjoy participation in a wide variety of sports and

physical activities. Adolescent access to sports fields and other PA facilities seemed to differ based on school type. Adolescents attending public schools reported fewer opportunities for PA inside and out of school, while private school attending adolescents reported greater access to sports teams (intermural and club) and PA facilities. Interestingly, adolescents from one of the low-income public schools reported that the sports fields were commonly in disrepair due to sporadic grounds keeping. Additionally, these same adolescents reported that even when the fields are in decent enough shape for use, they are not allowed to use them without supervision from teachers and school staff who are commonly preoccupied with meetings. This suggests that students at low SES public schools may have fewer total school-based opportunities for PA, which is associated with lower levels of PA(61).

Additionally, adolescents complained of a lack of park space or athletic facilities in their neighborhoods. This is important because the perception of limited facilities is positively associated with lower levels of PA. In a study of adolescent girls' perceptions of the number of PA facilities within a half-mile of their homes, it was found that the perception of easy access to individual PA facilities (basketball court, golf course, playing field, running track, skating rink, swimming pool, and tennis court) as well as the perception of the total number of facilities, were both positively associated with increased PA. Additionally, the authors noted that perceptions might be influenced by transportation patterns, since many of the girls were transported to and from school in private vehicles and may not have had exposure to PA facilities within a half-mile of their homes(62).

Additionally, adolescents and parents suggested that safety issues prevented

after-school PA near the school as well as in the home neighborhood. This is due to the combination of school ending late, early dusk in the winter, and not feeling secure while outdoors around the school or home. This goes along with stated parent preferences for children to be driven to and from school, or "passive transport." US parents who fear for the safety of their children use passive transport as a means of protection(63). The effects of neighborhood safety and PA in urban children supports that the positive association of an unsafe neighborhood environment with low levels of PA and high levels of passive transportation(64, 65).

In comparison with adolescents on a regional and global basis, the adolescents of this study suggest that they have adopted a westernized pattern of living. The areas of westernization most apparent from the participant data suggests that adolescents prefer and consistently consume westernized foods (highly processed and energy-dense), rely on mechanized transportation for movement to locations outside of their homes (even to locations within walking distance), and have adopted body size preferences similar to peers in developed-westernized nations. This is similar to African immigrants to western nations who have adopted western views(66). Together this suggests that the westernized aspects of the SEM and NT have powerful sway with the adolescents of this study putting them at increased risk of developing overweight and obesity.

School-Based Obesity Prevention with Family Involvement

Adolescents and parents of adolescents support a school-based obesity prevention program for adolescents that focuses on diet, PA, obesity education, and parental support. School-based obesity prevention programs focused solely on dietary education are effective in reducing child and adolescent BMI(67). Additionally school-based obesity

prevention programs focused on PA alone are only minimally effective in increasing PA in young adolescents and children and show very limited effect at lowering BMI(68). When combined together, school-based obesity prevention programs focusing on the two main lifestyle determinants of obesity, diet and PA, show a positive effect on lowering BMI(69). This positive effect on lowering BMI in adolescents and children is especially true when parents and families are involved as part of this multifaceted school-based adolescent obesity prevention program(63, 70).

Additionally, a school-based adolescent obesity prevention program that incorporates as many ecological levels of influence as possible has the highest likelihood of modifying the risk factors related to adolescent obesity(4, 44). Adolescent and parent program recommendations are consistent with an ecological approach. These recommendations focus on individual perceptions (intrapersonal); family, school personnel, and peer support (interpersonal); community involvement and modifying the school food environment (local); and in magnifying positive global media influence (global). Individually and together, these factors can influence adolescent health behaviors and decrease the risk of obesity in adolescents(49).

Adolescents and parents of adolescents suggest that sedentary behavior (TV, Facebook, homework) is a barrier to adolescent PA. Sedentary behavior is positively associated with increased BMI in children and adolescents(71). In a school-based longitudinal quasi-experimental study of parent involvement and child sedentary behaviors, parent involvement was positively associated with decreased sedentary behaviors(72).

Additionally a combination of parent and community involvement was found to

be effective in obesity risk reduction among a randomized group of Mexican American school-aged children with heterogeneous BMI's. The study group experienced statistically significant decreases in BMI, BMI z-scores, a significantly increased intake of fruits and vegetables, and significant increase in child self-efficacy related to healthy food choices(73).

Adolescent obesity prevention should involve parents and families and start as early as possible, providing a consistent message from professionals and parents regarding adolescent diet, PA, body size and obesity(63, 66). Additionally, and in congruence with parent reports of overfeeding children, the program should take into account parent concerns about growth and development that lead to overfeeding. The program should educate parents regarding adolescent overeating and proper food portions for development(74). Additionally, communication to parents of normal weight adolescents should be focused on the practicality and health benefits of obesity prevention in addition to developmental concerns(75).

Adolescents and parents of adolescents suggested that parents and families would support obesity prevention efforts for adolescents. A few adolescents, however, suggested that their parents continue to associate obesity with wealth, social status, and strength. Because body image beliefs begin in adolescence, it is key that perceptions of body image and consistent messages about body image are communicated to adolescents(29). Additionally this consistent message should be taught to and internalized by the adolescent's parents in order to actively dispel the cultural myths associated with obesity and provide in-home support for adolescent obesity prevention(33).

Similarly, adolescents and parents of adolescents suggested that the perception

of SES and westernized dietary choices influence decision-making. Namely that the consumption of westernized foods equates with higher SES than non-westernized foods. Therefore any obesity prevention intervention should take these perceptions into account and aim to change these perceptions.

Additionally, adolescents and parents of adolescents identified barriers to healthy eating and PA. These barriers are a lack of time, busy schedules, and fatigue. Similarly, school personnel from the study schools suggested that parents, while important to involve, might not have time in their busy schedules to be involved in an obesity prevention program(9). Several international studies of school-based obesity interventions with family involvement suggest that ways to work around parent schedules is to incorporate obesity prevention instructions into interactive homework that must be completed by students and a parent(76, 77). Additionally, school newsletters provide method of communication to parents that respect their busy schedules(77). Also, after school and early evening events or workshops should be flexible to parent feedback and planned on a limited basis with the objective of fewer and more concentrated sessions (1:45 session with a 15 minute break) rather than many shorter sessions (45min to 1:00)(78).

This is the first study of its kind in Botswana describing the perceptions of adolescents and parents of adolescents regarding adolescent obesity prevention, adolescent diet, PA, and body size. The descriptive results of this study provide knowledge of what was hereto unknown.

In conclusion, adolescents in urban Botswana can identify healthy versus unhealthy foods, yet choose unhealthy foods based on taste preferences, social

pressures including social status related to westernized foods, and the perceived lower cost of unhealthy foods. Similarly parents of adolescents suggest that the diet they prefer most for their adolescent children is the most-healthy diet, although the parents acknowledge purchasing unhealthy foods for their children based on the child's taste preferences and social pressures related to demonstrating a desirable SES.

Regarding body size preferences, adolescents suggest a westernized-normal weight body size is most desirable for themselves and in the opposite sex. Additionally they view overweight and obese body sizes as indicative of laziness, isolation, and negative social stigma. Similarly, parents of adolescents suggest that a westernized body style is most desirable for their children. These westernized preferences seem to have replaced, to a great degree, the historical notion that a large body size is consistent with wealth, strength, and prosperity. Adolescents and parents however do perceive that thinness might be related to illness, specifically suspected HIV infection. This is due to the relative high prevalence of HIV infection in Botswana.

Additionally, adolescents and parents of adolescents suggest a willingness to participate in obesity prevention programs and express the need for any such program to respect the increasing adolescent autonomy, and autonomy of the family generally. Adolescents suggested that any program developed for and instituted in the schools be voluntary, increase healthy food offerings while not eliminating all unhealthy foods, and be highly entertaining. Parents of adolescents suggested that the importance of the home should not be overlooked and that parents should be involved in any intervention.

Strengths

The heterogeneous sample of students and parents of the study provided rich

data from which to describe the participants' perceptions of diet, physical activity, body size, obesity, and obesity prevention interventions. Rigorous qualitative methods were utilized throughout data collection, data preparation, and data analysis to provide rich descriptive results consistent with the participants' original meanings. Trained research assistants completed the data transcription and translation of focus group recordings. These research assistants are fluent in both Setswana and English, thereby minimizing transcription and translation errors. Also, through consistent collaboration and mentored debriefing with a researcher who is from the local culture, the cultural meanings of participant statements were maintained.

Limitations

While the adolescent and parent participants of this study were selected to best represent a heterogeneous sample of students and parents in Gaborone, Botswana, a limitation is that this study is only applicable to urban living adolescents attending public and private school in the capital city and cannot be generalized to more rural settings. Additionally, the adolescents and parents of this study are not true dyads, which would have given a more intimate view of the interpersonal influence of parent and child. Also, it cannot be completely ruled out that cultural differences between the researcher and study participants might have led to misunderstanding some issues. These potential misunderstandings were mitigated through consistent collaboration and mentored debriefing with a researcher who is from the local culture.

Recommendations

Future school-based interventional research related to adolescent obesity in urban Botswana should be longitudinal and be built around mixed methodologies. Also,

future research should incorporate true parent child dyads and examine ways to add adolescent-peer dyads to study peer influence among adolescents. Similarly, quantitative methods should be used to measure the food environments in the home, school, and community as well as the caregiver feeding styles of parents in Gaborone, Botswana. Qualitative methods should be implemented to capture adolescent and parent perceptions regarding the obesity prevention intervention.

School-based obesity prevention programs in Gaborone, Botswana should begin with students at an early age and focus on modifying the adolescent student health behaviors by way of changes to the cafeterias and tuck shops at school, entertaining health behavior lessons, and in offering a wider variety of sports, both competitive and non-competitive. Additionally, this program should incorporate parents, families, and peers as much as possible in creating a congruent message about adolescent health behaviors while respecting the growing autonomy of adolescents and the many responsibilities of parents.

Appendix A
Focus Group Guide

ADOLSECENT Focus Group Data Collection Form

Qualitative Exploration of Adolescent Diet and Activity
University of Botswana and University of Pennsylvania

Structured Guide for Focus Groups

School_____

Location of focus group sessions _____

Date of focus group_____

Moderator _____ Recorder_____

Start time_____ End time _____ Duration _____

I. Introduction

• Prior to the group discussion, please review the guide for conducting each focus group, as well as the objectives for conducting this research.

• As each participant arrives, introduce yourself and ask them what school they attend to be sure they meet sampling criteria.

• Prior to beginning each discussion, please greet the participants and thank them for coming to today's session.

• Introduce the research team.

• Confirm that the child's parent has signed the consent forms. Hand out and **read the adolescent focus group consent/assent form** to the participants.

• Ask the participants if they have any questions. After all questions are answered sufficiently, ask each member to sign the form if they would like to participate.

• Please advise the participants that their comments will be held in the strictest of confidence.

• During each focus group, keep track of each participant's number and assign this number to each comment made by the participants.

• Advise the participants that answers are opinions so it is important to respect everyone's answers.

• Advise the participants that their honest answers are very important and that they are the experts on these topics.

II. Questions for Participants

(THE RECORDER MUST RECORD THE PARTICPANTS' NUMERICAL IDENTIFIER ALONG WITH HIS/HER COMMENTS)

Q1. The moderator poses the following instructions to participants:

Let's start by going around in the circle and each of you sharing with us what you think is the most desired diet.

The moderator asks the following questions if the details are not provided in the discussion.

- Describe each type of food that is desired.
- Describe the amount or how much food that would be desired.
- Why do you desire this diet?
- What foods are not included in your idea of a desired diet? Why?
- What foods do you consider to be healthy?

Q2. The moderator poses the following question to participants:

Sometimes there are things that make it hard to have a healthy diet all the time. What are the difficulties to eating a healthy diet everyday?

The moderator asks the following questions if the details are not provided in the discussion.

- Are these difficulties the same for everyone in the community?
- What are the causes of these difficulties?
- How could these difficulties be improved?

Q3. The moderator poses the following instructions to participants:

Let's now talk a bit about physical activity. When we say physical activity we mean *any* activities that go beyond an individual's baseline light-intensity activities of daily living. What do you think about physical activity in your life?

The moderator asks the following questions if the details are not provided in the discussion.

- What type of physical activities do you like to do?
- Do you think physical activity is important for your health?
- What type of physical activities do you consider to be healthy?
- Who should do physical activity?
- Are there any challenges to doing physical activities everyday?

Q4. The moderator poses the following instructions to participants:

Now I will show you some pictures of women/men that have different body sizes, tell me which one each of you think has the most desired shape.

The moderator shows the 10 silhouettes of women/men and asks each participant to select which image is most ideal woman/man.

The moderator asks the following questions if the details are not provided in the discussion.

- Why do you think the image you selected is the best?
- What kind of diet would you need to eat to have this desired shape?
- What kind of health would a person of this shape have?
- What do you think about these women/men? (point to obese body shapes)
- Do you think that as you get older you will look different than you do now?
- What do you think of weight loss?
- What do other people think of weight loss?

Q5. The moderator poses the following instructions to participants:

When thinking about healthy food and activity choices to prevent obesity, what are the most important things that affect your decisions?

The moderator asks the following questions if the details are not provided in the discussion.

- What would your family think about you making healthy behavior changes and preventing obesity?
- What would your school friends think about you making healthy behavior changes and preventing obesity?
- What would national leaders or other influential people in your community think about you making healthy behavior changes and preventing obesity?
- Is it cool to be physically active and eat healthy and not to be overweight?
- Are there people you can name who model healthy behavior and praise others for making healthy choices?

Q6. The moderator poses the following instructions to participants:

We are thinking about organizing a health program to help kids in your school prevent obesity. In designing a program to prevent obesity, what do you think are the most important things to do?

The moderator asks the following questions if the details are not provided in the discussion.

- What people, information, or things would make kids want to participate in a program designed to prevent obesity?
- What would make kids ***NOT*** want to participate in a program designed to prevent obesity?

Q7. The moderator poses the following question to participants:

Would anyone like to share anything else about diet, body size, or health? Please share anything that you think is important for me to hear to understand the general practices in your community?

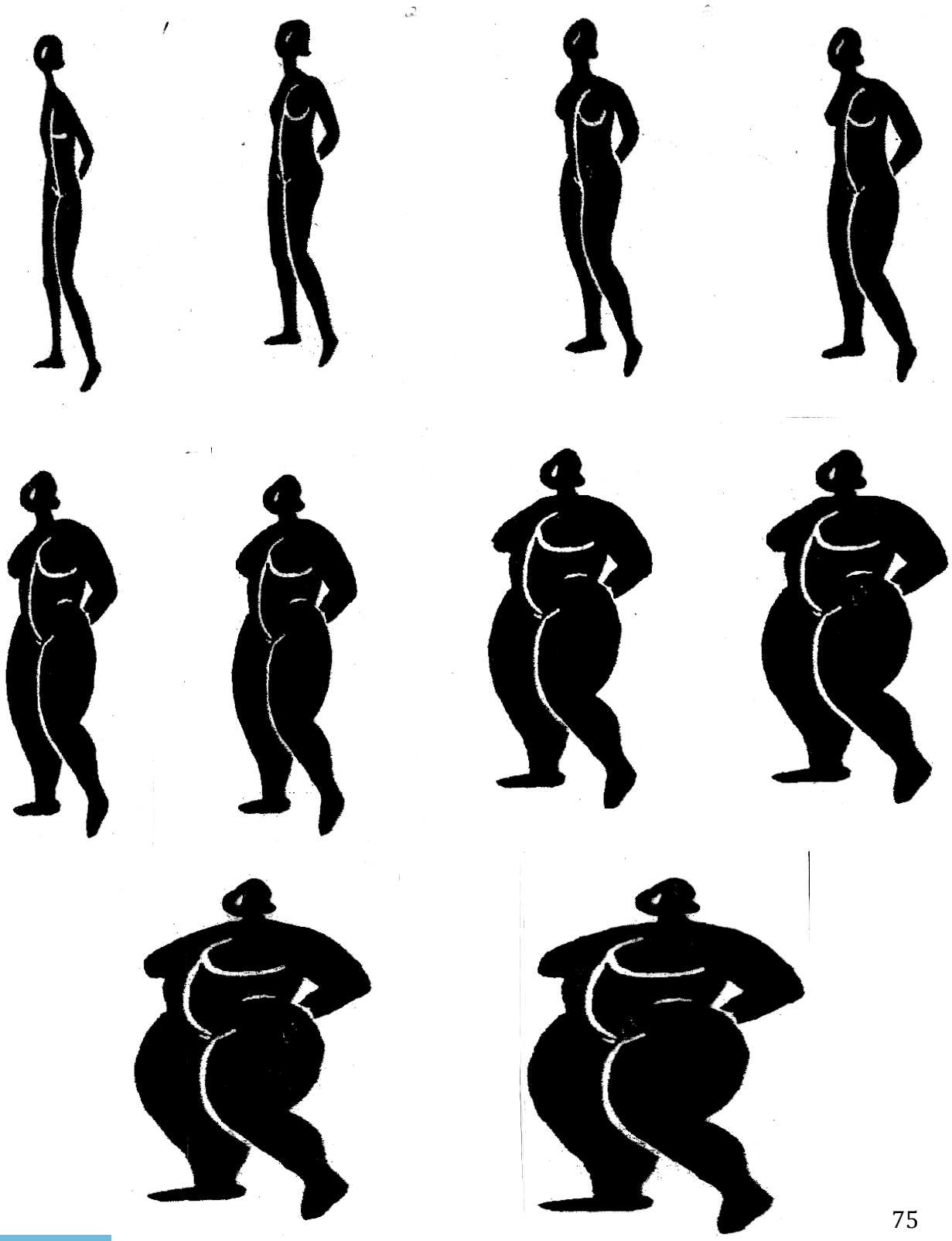
Moderator concludes focus group by summing up main points about what the participants perceive as a healthy diet and thanks them for their participation.

III. Discussion between Moderator and Recorder

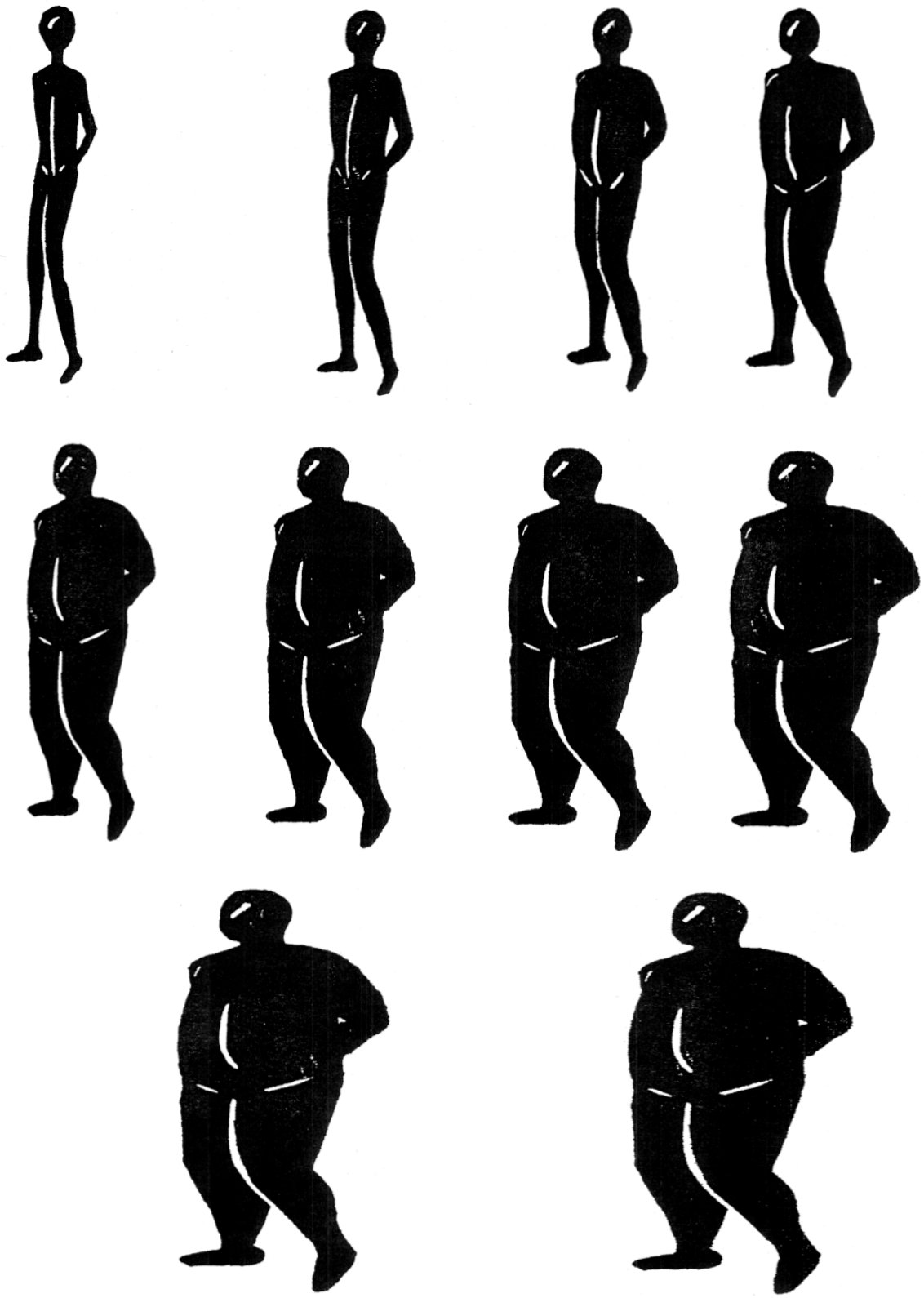
Focus group moderator and recorder will discuss the focus group. In particular they will discuss:

- What went well about the focus group?
- What could be improved for next time?
- What topics surprised you in the focus group?

Body Size Images (Women)



Body Size Images (Men)



Appendix B

Focus Group Guide

PARENT Focus Group Data Collection Form

Qualitative Exploration of Adolescent Diet and Activity
University of Botswana and University of Pennsylvania

Structured Guide for Focus Groups

School of Child_____

Location of focus group sessions _____

Date of focus group_____

Moderator _____ Recorder_____

Start time_____ End time _____ Duration _____

I. Introduction

• Prior to the group discussion, please review the guide for conducting each focus group, as well as the objectives for conducting this research.

• As each participant arrives, introduce yourself and ask them what school they attend to be sure they meet sampling criteria.

• Prior to beginning each discussion, please greet the participants and thank them for coming to today's session.

• Introduce the research team.

• Hand out and **read the parent focus group consent form** to the participants.

• Ask the participants if they have any questions. After all questions are answered sufficiently, ask each member to sign the form if they would like to participate.

• Please advise the participants that their comments will be held in the strictest of confidence.

• During each focus group, keep track of each participant's number and assign this number to each comment made by the participants.

• Advise the participants that answers are opinions so it is important to respect everyone's answers.

• Advise the participants that their honest answers are very important and that they are the experts on these topics.

II. Questions for Participants

(THE RECORDER MUST RECORD THE PARTICPANTS' NUMERICAL IDENTIFIER ALONG WITH HIS/HER COMMENTS)

Q1. The moderator poses the following instructions to participants:

Let's start by going around in the circle and each of you sharing with us what you think is the most desired diet for your child.

The moderator asks the following questions if the details are not provided in the discussion.

- Describe each type of food that is desired.
- Describe the amount or how much food that would be desired.
- Why do you desire this diet for your children?
- What foods are not included in your idea of a desired diet? Why?
- What foods do you consider to be healthy?
- How are the foods that you eat different from the foods that your child eats?

Q2. The moderator poses the following question to participants:

Sometimes there are things that make it hard to have a healthy diet all the time. What are the difficulties to eating a healthy diet everyday for your child?

The moderator asks the following questions if the details are not provided in the discussion.

- Are these difficulties the same for everyone in the community?
- What are the causes of these difficulties?
- How could these difficulties be improved?

Q3. The moderator poses the following instructions to participants:

Let's now talk a bit about physical activity. When we say physical activity we mean *any* activities that go beyond an individual's baseline light-intensity activities

of daily living. What do you think about physical activity in your child's life?

The moderator asks the following questions if the details are not provided in the discussion.

- What type of physical activities does your child like to do?
- Do you think physical activity is important for your child's health?
- What type of physical activities do you consider to be healthy?
- Who should do physical activity?
- Are there any challenges for your children to doing physical activities everyday?

Q4. The moderator poses the following instructions to participants:

Now I will show you some pictures of women and men that have different body sizes, tell me which one each of you think has the most desired shape for your child.

The moderator shows the 10 silhouettes of women/men and asks each participant to select which image is most ideal woman/man.

The moderator asks the following questions if the details are not provided in the discussion.

- Why do you think the image you selected is the best for a child?
- What kind of diet would a child need to eat to have this desired shape?
- What kind of health would a child of this shape have?
- What do you think about these women/men? *(point to obese body shapes)*
- Do you think that as your child gets older they will look different than you do now?
- What do you think of weight loss?
- What do other people think of weight loss?

Q5. The moderator poses the following instructions to participants:

When thinking about healthy food and activity choices to prevent obesity, what are the most important things that affect your child's decisions?

The moderator asks the following questions if the details are not provided in the discussion.

- What would you think about your child making healthy behavior changes to prevent obesity?
- What would your family think about your child making healthy behavior changes and preventing obesity?
- What would national leaders or other influential people in your community think about your child making healthy behavior changes and preventing obesity?

- Is it cool for your child to be physically active and eat healthy and not to be overweight?
- Are there people you can name who model healthy behavior and praise others for making healthy choices?

Q6. The moderator poses the following instructions to participants:

We are thinking about organizing a health program to help children in your child's school prevent obesity. In designing a program to prevent obesity, what do you think are the most important things to do?

The moderator asks the following questions if the details are not provided in the discussion.

- What people, information, or things would make children want to participate in a program designed to prevent obesity?
- What would make children ***NOT*** want to participate in a program designed to prevent obesity?
- What kind of involvement would you want to have as a parent?
- Would you, as a parent, support programs to prevent obesity in schools?

Q7. The moderator poses the following question to participants:

Would anyone like to share anything else about diet, body size, or health? Please share anything that you think is important for me to hear to understand the general practices in your community?

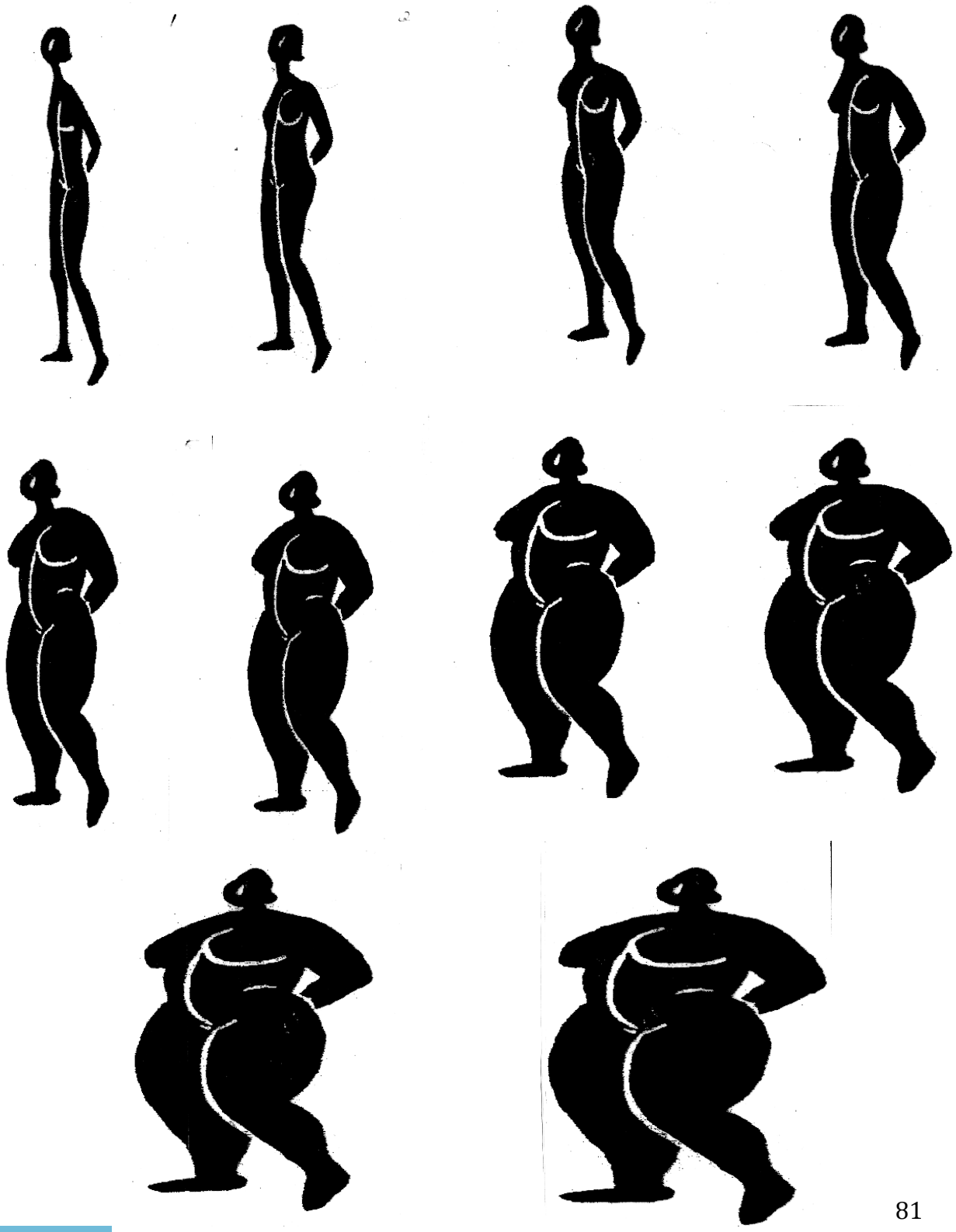
Moderator concludes focus group by summing up main points about what the participants perceive as a healthy diet and thanks them for their participation.

III. Discussion between Moderator and Recorder

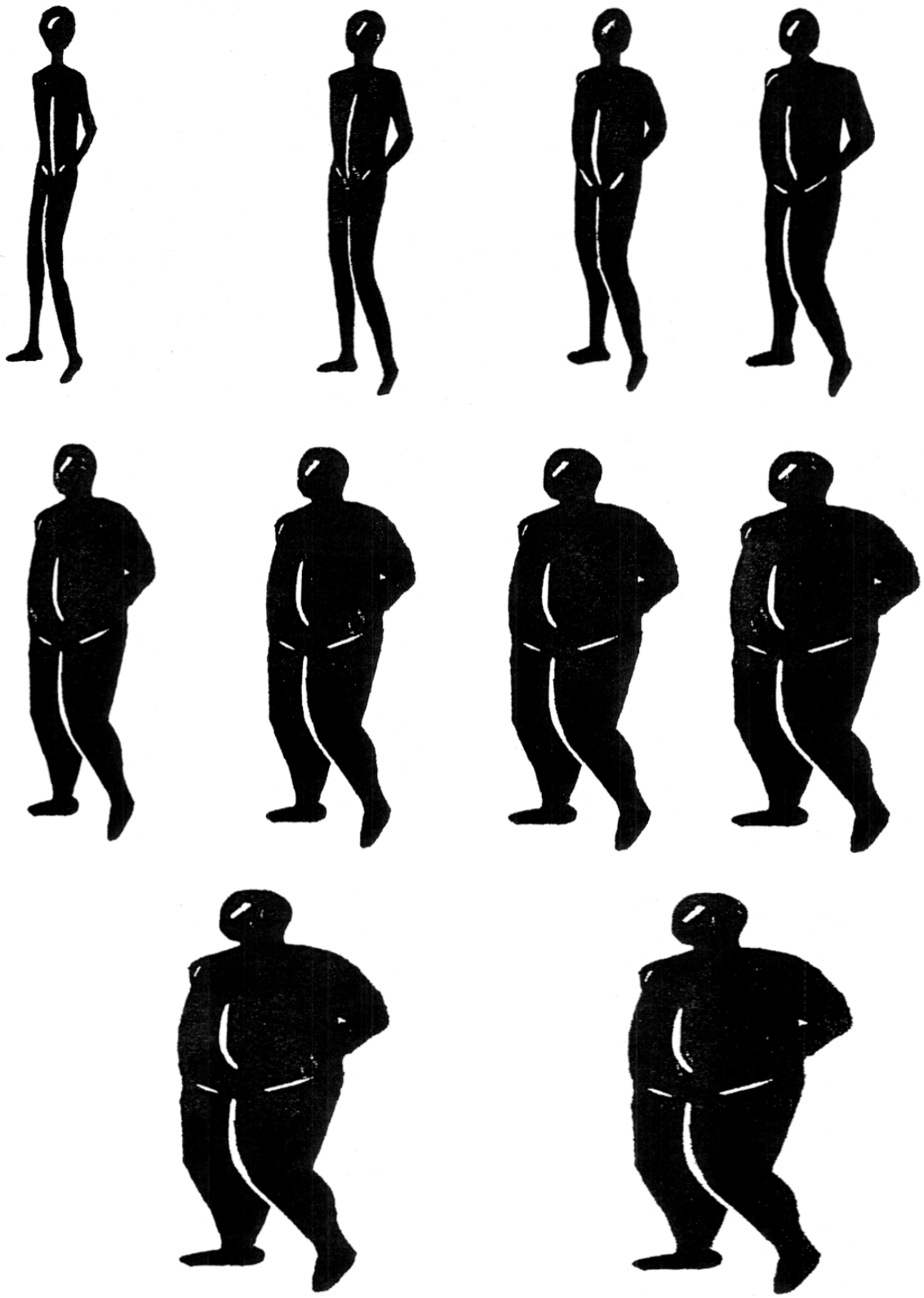
Focus group moderator and recorder will discuss the focus group. In particular they will discuss:

- What went well about the focus group?
- What could be improved for next time?
- What topics surprised you in the focus group?

Body Size Images (Women)



Body Size Images (Men)



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