CHILDHOOD OBESITY PERCEPTIONS IN THE PERUVIAN AMAZON

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ABSTRACT

While childhood obesity is not typically a concern in developing countries, there has been a dramatic increase in the incidence of overweight and obese children within these limited resource countries. Various contributors play into why populations see this increase, most notably the improving economy. As countries, such as Peru, develop economically, they begin to see a double-standard phenomenon, where infant mortality rates and undernutrition are falling, yet the number of children becoming overweight and obese is rising. Perceptions of health dictate what needs to change and ultimately what policies are implemented. This qualitative study utilizes a field experience to explore how childhood obesity is perceived in an urban, semi urban, and rural setting in Amazonian Peru, and why or why not people in these areas believe childhood obesity to be an issue. Diet was also looked at as a potential issue, though most people did not see a connection between diet and weight gain. Most respondents did not believe childhood obesity to be an issue, though obesity in adults was viewed as increasingly prevalent in some interviews. Peruvians in this area of the Amazon Basin do not consider childhood obesity to be a concern, and many believe it is an issue for larger cities and more developed areas. Due to this perception, no governmental changes are likely to be implemented to combat the growing issue within this area.

TABLE OF CONTENTS

LIST OF FIGURES

PREFACE

This field study comprised one component of the author's experience with the National Collegiate Honors Council 2015 Health without Borders winterim in Peru. This program combined cross-disciplinary study and cultural immersion to consider environmental and health implications of rapid growth in a developing country. Participants studied emerging diseases and health issues in the Amazon, perceptions of health among rural and urban residents, and the intersection of indigenous and modern medicine. Three weeks were spent in the Peruvian Amazon, specifically in Iquitos, Mazán, and villages along the Orosa River in Loreto, Peru. The author's interest in diet and nutrition motivated this specific research into perceptions of obesity among Peruvians in distinct populations. This study shares the results of focused conversations and the author's personal observations while being fully immersed into the local culture to explore and better understand the perspectives of the participants.

BACKGROUND

Peruvian History

Peru hosts people from various backgrounds and cultures, blending indigenous traditions with Spanish influence. Natives were believed to have first come to Peru from Asia in 17,650 B.C., and although speculation about Natives from the north circulate, the exact known paths and timing are still unknown (Dobyns & Doughty, 1976). Over time, several plants and animals became domesticated in the Andes, making this central region one of the

world's greatest centers for domestication pre-Columbian Exchange. Around 1800 B.C., the large scale cultivation of maize changed the diets of ancient Peruvians and allowed a once predominantly nomadic people to settle, changing the dynamic of the culture. Once fermentation was understood and utilized, *chicha*, a maize beer, became a cultural component of religious and fertility rituals. The production and widespread use of maize opened the doors for trade, promoting cultural exchange between tribes along the coast, in the mountains, and in the rainforest.

The trade of food and ideas spread rapidly through Peru, leading to the construction of irrigation canals in the highlands, as well as a greater variety of foods available in different regions (Dobyns & Doughty, 1976). Naturally, this led to more peoples settling, eventually leading to the development of the first large scale regional culture, *Chavín*, which implemented an organized, inter-village political system. Through various conquests, the Peruvian culture changed and adapted to each new influence, laying a foundation of "civilized" people prior to the Incan conquest. During the Incan dynasty, peoples were forced to relocate, and attempts to unify culture and language were made. Such efforts were unsuccessful as various indigenous groups spoke different dialects and remained in traditional costume. Politically, the Inca quickly unified the country, leading to the blending of various regional dialects and customs that caused a cultural shift in language, dress, and beliefs through much of Peru, the regional variations remained.

In 1524, the first Spaniards landed in the region, eventually overtaking the area by the early 1570s (Bauer, 2005). After the classic colonial period that followed the overtake of the region, a shift in political rulers in Spain caused major policy changes in Peru. Natural resources, in particular the Huancavelica mercury line, led to competition for these valuable

resources in the colonies, causing rebellion and eventually leading to Peruvian independence (Dobyns & Doughty, 1976). After gaining independence, however, the struggle to gain and maintain control of vital resources led to constant political unrest, causing the rural Native populations to live in isolation and serfdom while the elite in Lima thrived economically. This social construct of the 1800s continued into the early 1900s, as political reformation played more to the southern regions, home of most of the country's political and social elite, while the indigenous populations in the Amazon were left with policies that did not impact or adversely effected them.

Today's Peruvian culture incorporates many different aspects from various influences, from indigenous traditions in medicine to western style businesses. Emigrants, in particularly the Japanese, the most notorious being former President Fujimori, have had great influence on the Peruvian culture and economy. The mix of culture in Peru led to political power struggles, with the indigenous communities falling to the wayside while those of European descent rose to power and made up most of the elite (Werlich, 1978). In President Fujimori's case, his regime led Peru down a much different path than anticipated. In 1990, Fujimori put in a bid for the presidency running on the idea that he was a more "down to earth" and "for the people" candidate versus his opponent, Vargas Llosa, who showed up to events in armor plated Volvos and looked like he was part of the white elite that dominated politics at the time (Conaghan, 2005). Fujimori won the election. Despite his initial slogans that proclaimed support for the "regular" people, his presidency thrived on corruption and ill-conceived attempts at improving the lives of those who needed it. In 2000, he fled to Japan after a video came out of a bribe among officials. He resurfaced in 2005 in Chile and was jailed for fraud, violation of human rights, murder, and corruption (Reel & Faiola, 2005).

Despite his history of corruption and lies, one of his hailed policies is his family planning program that allowed impoverished women to receive birth control at no cost to them (Boesten, 2007). His regime led to the economic stability of Peru, though the country still is in a developing stage, but remnants of failed projects can be seen throughout the small villages in the Amazon Basin, such as empty schoolhouses and unused telephone lines in villages along the Orosa River.

Obesity: Definitions and History

Malnutrition encompasses all that is non-nutritive, which includes overweight and obesity. Obesity is essentially an imbalance between calories consumed and expended due to various factors that results in being overweight (WHO, 2015). An increase in consuming energy-dense foods high in fat combined with a decrease in physical activity are the main culprits behind the development of obesity, though genetic factors may play a role in fat production and storage. Obesity is better defined as having a weight-for-height ratio more than 3 standard deviations above the World Health Organization Child Growth Standards median for children from birth to less than 5 years old, and more than 2 standard deviations above the reference median for children 5 to less than 19 years old (WHO, 2016).

While there have always been people who fit the definition of obese, history at one time praised and sought after those of larger size and body weight (Eknoyan, 2007). Prehistorically, having extra stores of fat kept humans alive in times of famine and when food was not consistently available, which meant having that body type was beneficial, and thus more desirable (Eknoyan, 2006). During the Stone Age, obese women were idolized and were considered to be more fertile as evidenced by the famous Venus of Willendorf figure. The continuous limits in food access as history progressed led to the belief that having more

body fat was best, and art continued to reflect that belief and desire (Eknoyan, 2007). This ideal continued into more modern culture, and it wasn't until the mid-1900s that adverse effects of having a larger body mass were fully documented, shifting the view from positive to potentially harmful (Eknoyan, 2006). In the 1900s, being grossly overweight was deemed a moral failing, and overeating was the prime culprit cited in texts. Insurance companies started citing trends of increased comorbidities with patients who were also overweight in the early 1900s, leading to more research into human processes and fat production and storage.

Global, Socioeconomic, and Cultural Trends

Each country has a unique relationship with childhood obesity, as economic, social, and historical factors influence the contributors to developing obesity. In the United States, about 17%, or 12.7 million, of children aged 2-19 are considered obese, a condition which is associated with various cultural and socioeconomic factors (Centers for Disease Control and Prevention, 2015). Obesity is more common among Hispanics and non-Hispanic blacks versus non-Hispanic whites, though is lowest among Asian youth.

In the 1980s, obesity and economic trends reflected that developing countries had lower instances of obesity among their lower classes, but rates increased as wealth and food availability increased in higher classes (Sobal & Stunkard, 1989). Recent updates have been made to the original study, finding that obesity is no longer confined to a developing country's elite, but now effects those of lower socioeconomic status as the country as a whole continues to grow economically (Monteiro, Moura, Conde, & Popkin, 2004). While lack of food and high energy consumption due to hard labor jobs may have prevented some obesity in the earlier study, those same factors become less common as the country continues to

develop but still leaves the lower class with limited food options when compared to their higher class counterparts.

In France, the slender figure is often sought after, contrary to other European countries, yielding lower rates of obesity than other countries (de Saint Pol, 2009). However, despite the cultural stigma against those of larger body mass, childhood obesity rates are on the rise, causing concern among policy makers as the direct costs of obesity account for approximately 2% of the French healthcare system's yearly expenses. The significance of France's obesity dilemma lies in the fact that obesity is more prevalent among the working-class, with not only the rates of obesity increasing in that class but the gap between the amount of obese people in the working-class and upper-class also widening.

The Gambia suffers from a phenomenon similar to Peru. Undernutrition and obesity can be seen side by side, and the government tries to combat the continuous fight against infectious disease while taking on a new burden of hypertension and obesity (Prentice & Webb, 2004). After the collapse of a prominent cash crop in the Gambia, many left their farming communities and migrated to the city, leading to increased sedentary lifestyles and consumption of high-fat diets. Obesity, once limited to chiefs and their wives, continues to rise as the population tries to deal with the health effects.

One of the major factors influencing development of obesity in childhood are the parents. Children in the U.S. are more likely to be obese or become obese if the head of household has not achieved higher education levels, with children living in homes with adults who have completed college half as likely to be obese as those living in households where the highest level of education received is some high school (CDC, 2015). This could be related to food costs, as parents with higher education typically have higher incomes and can

afford healthier options. Despite education levels, parents may not even recognize that their children are overweight or obese. When parents do accurately identify overweight and obese children, they are still no more likely than those who do not identify overweight and obesity to implement healthy behaviors, such as incorporating more fruits and vegetables or limiting sugary and fast foods (Neumark-Sztainer, Wall, & van den Berg, 2008). This may be due to the children's behaviors, such as food preference, activity preferences, and behavior issues, as well as parental behaviors such as inconsistencies in parenting, stress, and available time (Pocock, Trivedi, Willis, Bunn, & Magnusson, 2009). The relationship between parental influences and obesity rates will increasingly confront Peruvians as the country continues to develop economically without having preventative policies and education in place.

Adverse Effects Related to Obesity

The shift in perception of obesity changed from beautiful and desirable to unhealthy and less favored in the 1900s, and much of that change is due to health risks and effects associated with being overweight and obese (Eknoyan, 2006). In children specifically, being overweight and obese increases the risk for and development of type 2 diabetes (National Heart, Lung, and Blood Institute, 2012). Overweight and obese children are at increased risk of developing various non-communicable diseases as they enter into adulthood as well. Coronary heart disease is a result of plaque build-up in the coronary arteries, which can cause chest pain and, if the vessels become completely blocked, may lead to heart attack. Heart failure, which limits the amount of blood that is able to adequately perfuse vital organs and can lead to fluid overload and kidney failure, may occur as a result of obesity.

High blood pressure may also occur as a result of being overweight and obese. This condition causes the heart to work harder, puts stress on the body as a whole, and may lead to

stroke (National Heart, Lung, and Blood Institute, 2012). Plaque that has built up causes arteries to become narrow; if a clot or piece of plaque breaks off and becomes lodged in the already narrowed vessels, blood supply may be cut off entirely, causing a stroke.

Type 2 diabetes occurs when the body no longer uses the insulin it naturally makes properly, and may also result from obesity (National Heart, Lung, and Blood Institute, 2012). In the beginning stages, the body tries to compensate for the resistance by overproducing insulin, but over time the pancreas cannot meet the production needs to maintain control over sugar levels and eventually stops working (American Diabetes Association, 2015). Diabetes also contributes to many of the same diseases that obesity does, as well as blindness, neuropathy, pain, and early death (National Heart, Lung, and Blood Institute, 2012).

Other diseases at least partially attributed to obesity include, cancer, osteoarthritis, sleep apnea, obesity hypoventilation syndrome (OHS), gallstones, and reproductive difficulties in women (National Heart, Lung, and Blood Institute, 2012). High cholesterol contributes to the production of gallstones, which cause severe back and abdominal pain depending on the size and location of the stone. Sleep apnea and OHS are breathing disorders that may lead to hypoxemia, closed airways, and early death.

Treatment of many of these issues are costly, and some require long term interventions and management that people in poverty stricken areas with limited access to healthcare may not be able to afford or even receive. In the U.S., it costs anywhere from $54,000 to $130,000 to treat type 2 diabetes over a lifetime, something that an impoverished family in Peru unable to make more than the equivalent of $5 a week could not even imagine paying for (Zhuo, Zhang, & Hoerger, 2013).

Childhood Obesity in Peru

Peru suffers from a phenomenon the WHO calls the *double burden phenomenon* where economically the country is stabilizing and improving, yet hasn't become a developed country, thus leaving the country with decreasing rates of starvation but increasing rates of obesity (Chaparro & Estrada, 2012). Similar to France, Peru's working class suffers from increasing rates of obesity, though Peru still has high rates of starvation among the same demographic. Similar to the Gambia, populations once ravaged by starvation are now faced with children undernourished alongside children who are overweight.

In a study done in large Peruvian cities, over two thirds of respondents were classified as overweight or obese, with high prevalence of other non-communicable diseases (Goldstein, Jacoby, Aguila, & Lopez, 2005). The study also found that as one looked at lower social classes, the rates of obesity and related diseases increased, putting a larger burden on an already underserved population. Poverty's influence on diet, physical activity, and physiological processes limits the ability for Peruvian people to live healthy lives and gives those living in poverty the toughest cross to bear.

Among Peruvian women, socioeconomic status, education level, and location all influence obesity rates. Rural residents are less likely to be obese, but residents living in poverty are more likely to be obese (Poterico, Stanojevic, Ruiz-Grosso, Bernabe-Ortiz, & Miranda, 2012). Women are also more likely to be obese with lower levels of education, which may be linked to poverty. While a mother's obesity does not necessarily indicate she will have obese children, parental influences as mentioned previously do play an important role in children's health.

Food Security and Availability

Despite Fujimori's efforts, modern Peru remains a developing country (United Nations, 2014). The impoverished suffer from various diseases, communicable and non-communicable, with indigenous populations falling into this category. Peru's history of conquest, violence, and a blending of various cultures paved the way for the current social class system and disproportionate distribution of goods, most importantly food.

Though food is an essential part of human life, many areas in Peru have limited access to nutritive options that are required to live healthy lives. Food access and quality play a large part in determining the health of person. Peru lies on the west side of South America, and hosts a variety of climates and environments which directly impact food availability and access. Nearly two thirds of the entire country's land mass lies in the Montaña region, the area east of the Andes in the Amazon Basin (Werlich, 1978). Although the quantity of land is plentiful, the land is difficult to cultivate, despite its nutrient rich soil, due to the very factors that allow the natural vegetation to thrive. Constant river flow, high temperature and humidity, insects and creatures, and disease spread that naturally occurs due to all of these factors limit transportation and diminish the appeal of living in this region. Limited transportation and low appeal leads to less people settling and cultivating land, and those who choose to live in this region live off of subsistence farming.

The typical diet of a Peruvian living in the Amazon Basin differs substantially depending upon the area of the Amazon they reside in. Most families living in the Amazon are small-scale farmers and rely heavily on diversity of food, wood as fuel for cooking, medicinal plants, and sources of protein (Ortiz, Nowak, Lavado, & Parker, 2013). Fish is considered a staple as most populated areas are along rivers, and much of the economy relies

on fish, generating around US$100-200 million per year. Loreto, the state in which this study is based, makes one of the largest contributions to the GDP though agriculture at approximately 8.5%. Despite diversity among plants and the generous agricultural contributions through fishing, Amazonian Peru still suffers from food insecurity and vulnerability, with the most vulnerable areas also facing issues of poverty and limited access and availability. It is worthy to note that in all of Peru, not just the Amazon region, the only area that had low vulnerability was Lima.

Despite land richness, several factors contribute to the food insecurity in Amazonian Peru. Deforestation and climate change effect prices of food and transportation costs and limit useable land (Ortiz et al., 2013). While climate change is a global phenomenon, governmental policies may be implemented to combat the use of fuel that contributes to the increased carbon footprint, in turn making more land available and usable to those who need it. Oil companies threaten the livelihood of the people that call the Amazon home through deforestation and contamination (Finer, Jenkins, Pimm, Keane, & Ross, 2008). Due to major profits, the Peruvian government supports the oil companies, allowing around 72% of the Peruvian Amazon to be used for oil development. This land overlaps areas titled to the indigenous in those areas, pushing those people out and isolating them, limiting their access to clean, usable land and resources.

The World Health Organization and Efforts to Combat Obesity

The World Health Organization (WHO) recently released an updated report and plan on ending childhood obesity (WHO, 2016). The updated plan outlines various recommendations to address childhood obesity, from governmental policy suggestions and marketing restrictions to increasing activity levels and education in schools. The first major

recommendation highlights the government's role by implementing taxes on sugar sweetened beverages like Coca-Cola, implementing recommendations on the marketing to children, and establishing cooperation among countries to limit *cross-border marketing*. One of the major recommendations that this update outlines is increasing access to healthy food, especially in impoverished areas, yet this duty does not clearly fall to one interest group like many of the other recommendations. Without a clear party held responsible, ensuring that the WHO recommendations are being met may be difficult, as different groups may deflect responsibility onto others, leaving the local community to fend for themselves. Member States, nongovernmental organizations (NGOs), and the private sector all are accountable for certain aspects of increasing access, but the major barrier to the success of the WHO is achieving governmental support for change.

In 2013, Peru passed the *Promoting Healthy Eating for Children and Adolescents* law which included technical parameters for sugar, salt, and saturated fat labelling on food (World Trade Organization, 2016). These technical parameters, which were updated and approved in 2015, limited sugar to less than or equal to 2.5 grams in beverages and less than or equal to 5 grams in solid foods (USDA Foreign Agricultural Service, 2015). Salt was limited to 300 milligrams, or the equivalent of 120 milligrams of sodium, in both solid food and beverages, and saturated fat was limited to 0.75 grams or less in beverages and 1.5 grams or less in solid food. However, the law has yet to be implemented and major concerns have risen regarding its implementation and enforcement. Mexico raised questions regarding the parameters when the law first passed in 2013. Government officials released a statement of concern in 2016 outlining the reservations the country had regarding the law and their trade with Peru (World Trade Organization, 2016). In their statement, Mexico accuses Peru of

failing to comply with international trading regulations that require complete transparency and questions the scientific validity of the parameters outlined. Furthermore, Mexico asserts that "each person has different nutritional needs, and no food can therefore be characterized as 'good' or 'bad' in relation to its nutritional content." While Mexico may be trying to protect its own trade interests, Peru itself has issues with the law, saying that the new parameters are "extremely restrictive and posing an unnecessary burden on [them]" (USDA Foreign Agricultural Service, 2015). With inconsistencies among trade partners, as well as within the country itself, the law does not comply with WHO recommendations, leaving the country without the much needed support to combat the rise in obesity rates. If no one raises concern regarding childhood health, government policies and laws such as this will continue to mask the true state of the country, leaving those most at risk with limited support and resources to combat a multifaceted disease.

Childhood obesity will likely become increasingly problematic as Peru continues to modernize. Understanding how Peruvians perceive obesity is critical in developing effective measures to deal with anticipated health implications resulting from this condition. Qualitative studies examining perceptions of obesity can be a useful starting point in developing culturally-sensitive responses to this emerging health threat. To that end, a research study was developed to gather qualitative data to facilitate understanding of attitudes towards obesity in the Peruvian Amazon Basin.

METHODS

This is a qualitative descriptive study using semi-structured interview methodology while the researcher was engaged in a field experience in Peru. This form of interview allows for a more open-ended conversation (Norwood, 2010) and was used to obtain individuals'

experiences and concerns related to their perceptions regarding childhood obesity in Amazonian Peru. Using a semi-structured interview gives the participant more freedom when answering questions, while a structured type does not allow the participant to divert from the set of questions. The semi-structured methodology allowed many of the conversations to delve deeper, and more knowledge regarding the topic was obtained.

A convenience sample of volunteer interviews participated from three different areas (N=20): those who live in an urban setting (n=11), those who live in a semi-urban setting (n=6), and those who live in a rural setting (n=3). Interviews were conducted within the person's home or workplace within each area in Loreto, Peru. Locations included Iquitos, an urban area with about 416,400 people; Mazán, a semi-urban setting with a population of 5,000; and three villages along the Orosa River with populations no more than 100 each. Prior to the interview, participants were informed of the project and verbally agreed to participate. A total of 20 people took part in the interviews. Each interview consisted of five questions as follows: Basic Demographics (age, sex, occupation); Do you consider obesity in children an issue?; Have you noticed a trend of children getting bigger, smaller, or no change?; What is your regular diet?; and Were your children breastfed? Breastfeeding was included as there is a reported link between children who are breastfed and lower risk of childhood obesity (U.S. Department of Health and Human Services, 2014). Each participant was designated by number without respect to specific identifiers. Notes were taken during each interview for accuracy and later analysis.

PARTICIPANTS

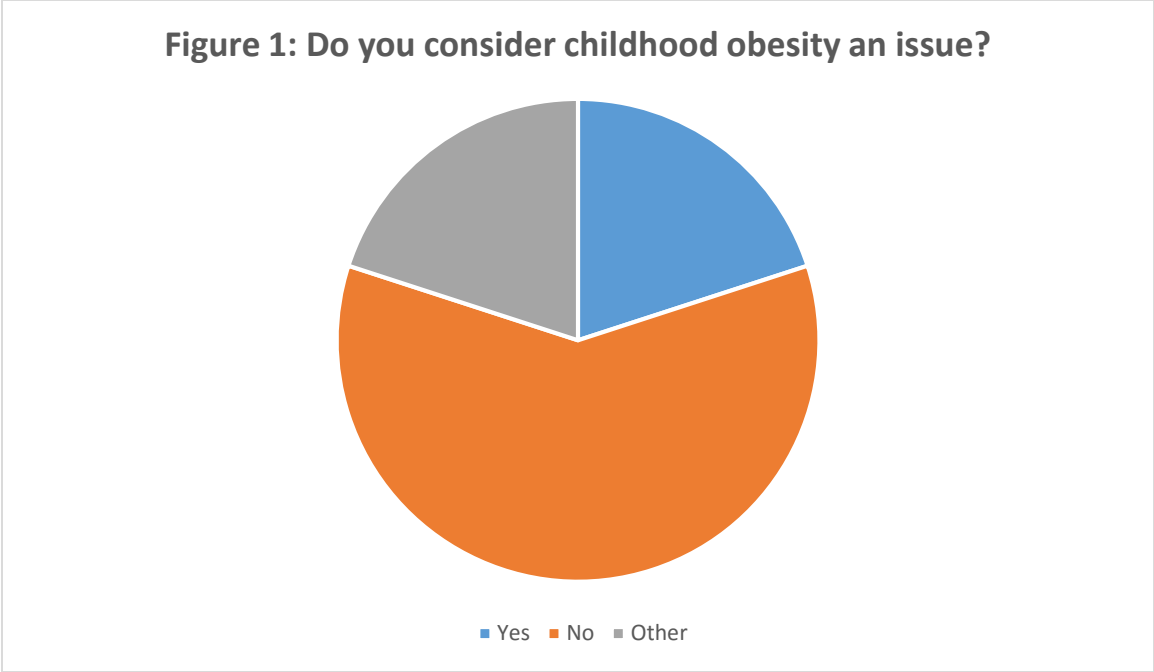
Participants were chosen as a convenience sample in each community based on who was available and voluntarily participated during the research days in each community.

Participants were over the age of 18 and lived in urban, semi-urban, or rural communities. A total of 20 people participated in this study. From Iquitos, 11 people participated; in Mazán, 6 people participated; and from the Orosa River, 3 people participated.

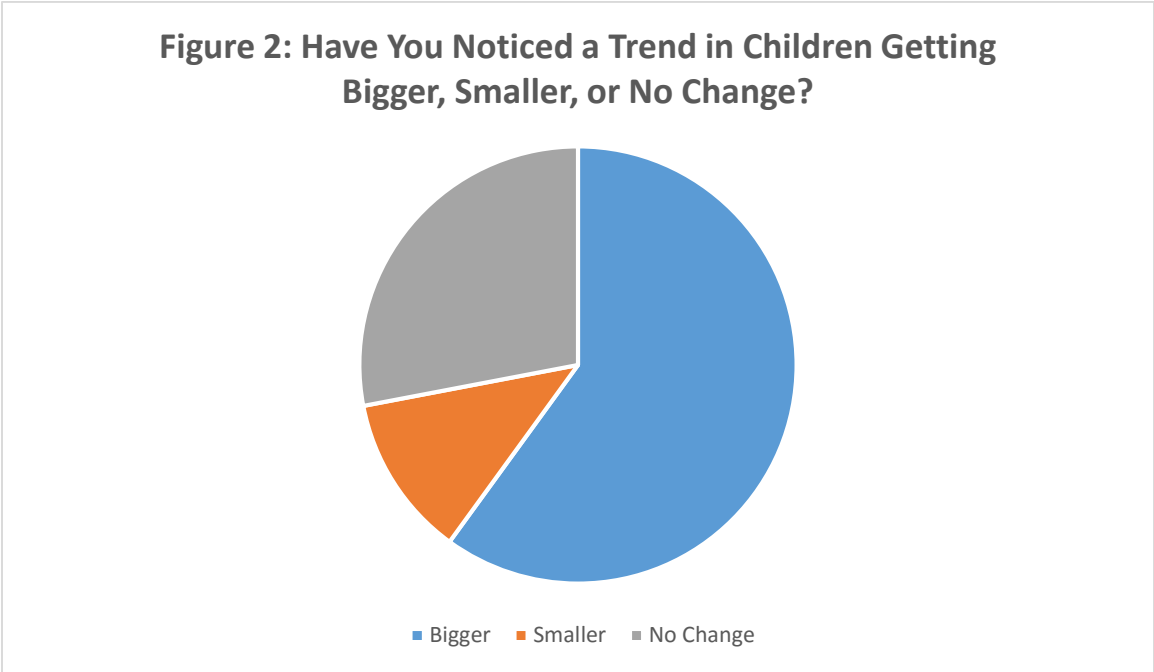
RESULTS

This study was conducted to explore and verify perceptions of childhood obesity in the Peruvian Amazon. This was done through a field study that allowed for cultural immersion and observation to understand how selected people in the observed areas perceived childhood obesity. Interview notes were analyzed using content analysis, a process of analyzing narratives, such as interviews, for themes and relationships or patterns (Norwood, 2010). Several themes emerged from the participant comments and responses in the interviews: education and the role of women, food availability and preparation, and governmental policies and controls.

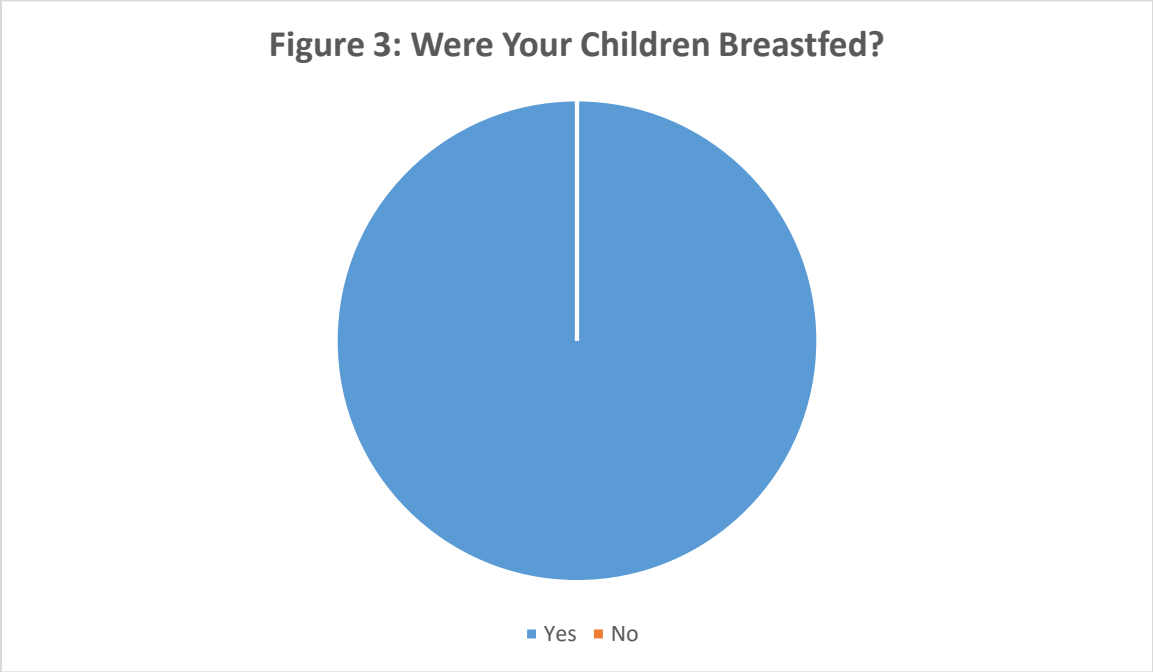
Simple calculated results to the answers to the five structured interview questions are as follows: when asked if participants considered childhood obesity to be an issue, 20% of respondents reported “Yes,” 60% said “No,” and another 20% thought it was an issue, but not in their location or was reserved for the wealthy. (Figure 1).



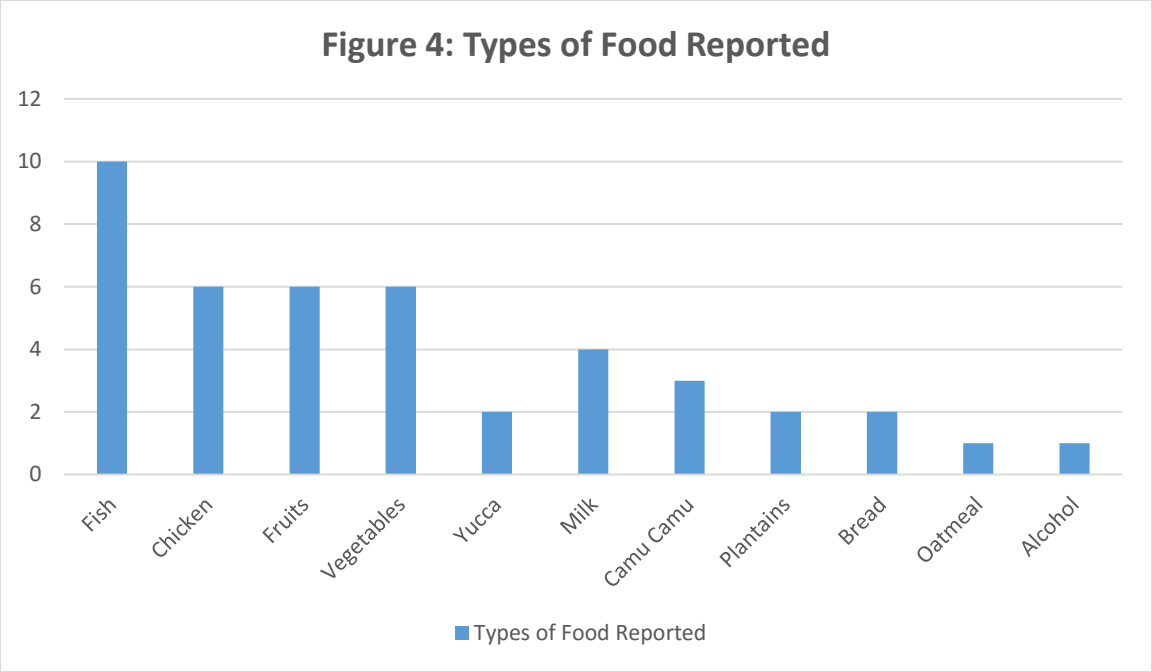
When asked if they had noticed a change in the trend of birthweights, 60% said "Bigger," 28% said "No," and 12% responded "Smaller." (Figure 2).



When asked if their children were breastfed, 100% of respondents said “Yes,” and further explained that there is no option for women in Peru other than breastfeeding. (Figure 3).



Regarding the average diet, responses were varied, though 50% reported fish as a staple in their diets. The only other protein included was chicken, with 6 of the participants saying it was included in their everyday diet. The terms “fruits” and “vegetables” were used as a general statement to cover all fruits and vegetables and 6 respondents reported they ate fruits and 6 reported they ate vegetables. Other reported foods were yucca with 2 respondents, milk with 4, camu camu (a native fruit) with 3, plantains with 2, bread with 2, oatmeal with 1, and alcohol with 1. (Figure 4).



Most participants reported that their children received meals at school during the school year through a system called *Caliwarma*, a government program that encourages children to attend school by providing breakfast and lunch. This was not included in the diet report. *Caliwarma* consists of a rice soup for breakfast and a starch of some sort for lunch and varies depending on where the school is located and the demographic the school serves. This service is not available when the children are not in school. When children are at home, they eat whatever is at home, and snacking is not typical in most households. One respondent reported that children in the rural areas eat more fruits and vegetables, such as plantains and tomatoes, because they eat right off of the trees, whereas children in the urban areas do not live near trees and do not have this opportunity.

Field Observations

When observing the people in a rural setting, many looked healthy and strong. Men and women were often in the fields in the morning, and sometimes children would go with them. Many children stayed behind, though, and appeared of healthy weight and height. They lived active lifestyles and would play soccer or volleyball in their front yards or would swim in the river. Undernourishment seemed to be more of an issue than overweight or obesity in the rural area. More food variety was available, and nothing observed was fried or preserved. Food was fresh and often caught or killed the same morning it was served. Fruits and vegetables were readily available and served at each meal.

In the semi-urban setting of Mazán, some adults did appear overweight. Most of them were shopkeepers and women, presumably as most of the men worked on the docks doing manual labor which would help manage weight. Of the children observed, only a few seemed overweight. These children played with others that looked undernourished, verifying the double burden phenomenon in this area. The food in this area was very salty as refrigeration was limited and meat needed to be preserved. Water was not always available, but Coca-Cola was always on hand. Fried foods, such as fried fish or chicken, were served for lunch and dinner every night during the time of this study. Vegetables were limited to heart of palm on most nights, and fruits were not served at all.

In Iquitos, the urban area, many people were overweight or obese. Children who were overweight typically had parents that were also overweight, and many of these families were observed at restaurants or fast food places in the city. The children who worked along the river or in the markets selling, however, were much smaller and bordered on underweight. In Punchana, a slum just within the city, mothers were overweight, but their children appeared

of healthy weight for their age. Some children appeared underweight, similar to the children along the Orosa River. Iquitos had a higher population of children that appeared overweight or obese, many of which were alongside children who appeared of healthy weight or underweight.

DISCUSSION

Results from this study implicate the need for further education and prevention regarding childhood obesity. While most did not find it to be an issue, developing countries have a 30% higher rate of increase in childhood overweight and obesity than developed countries (WHO, 2015).

When discussing the topic of obesity with prominent members of the various communities, several responses were notable. In Mazán, a pharmacist spoke about the community's issue with alcohol, and how men were drunk more often than not, which contributed to the laziness he associated with an increase in obesity in the community. His reasoning was that because the men were drunk and lazy, the children would become that way, and the cycle would continue through generations. He also spoke of parents that would starve their children on purpose so they would get benefits from the government, as the government only offers support to women and children, so the parents could eat. His overall belief was that children fared poorly because of parental actions. Perspectives like his, a man in a somewhat powerful position for his town, have the power to sway government officials, yet the rest of the people interviewed in that area did not feel the same.

Another interesting perspective was that of the shaman in a village along the Orosa River. Traditionally, shaman are highly revered, especially in small indigenous communities with limited access to western ideals. Shaman provide healing and education and are

traditionally leaders in their communities. He believed that obesity was an issue, but noted that people do not treat their bodies well and fail to eat foods they should in order to be strong. He agreed that children are increasing in size, but offered a non-scientific and non-measurable reasoning for his observations. He attributed it to the various animals of the Amazon giving these children strength and wisdom, something he denied having happened before. He attributes the taller, stronger children of today with the spirit of the manatee, bear, and *cuchun*, an indigenous term for pig. His stance on obesity was that it needed to be addressed, but people do not have the time or resources to grow and eat as they should, especially in today's changing world. His ideas and suggestions would be taken more seriously if Western medicine and ideas had not been introduced to this particular group of villages. He reported that while people do still come to him for medical treatment and advice, they often come to him as a last resort when Western medicine does not work. The general perspective, at least from his village, is that modern medicine only treats, but does not cure. Only traditional plants and methods can truly cure an illness, yet people still travel to the nearest clinic, which often takes the entire workday, before they seek out his help.

A dentist in Iquitos, the urban setting of this study, reported that he believed obesity to be an issue, especially in the children he saw. He himself tried to eat healthy, but like the pharmacist, he attributed the increasing obesity rates to laziness. That is not surprising as the demographic he serves is typically in the middle and upper-class. He agreed with the shaman that people do not treat their bodies well, but added that food was very expensive which made it hard for people to buy what they needed. While his family was fortunate to be able to go to the supermarket and buy the foods they wished, he noted that others in the same area that he shopped in did not have the means to even trade for goods at the Belén Market, a

market that serves a variety of people from all backgrounds and often has food much cheaper than the supermarkets.

Every area had someone of some importance to that community interviewed, and each prominent figure agreed that obesity is an issue, yet the people of the working class or those who were not in positions of power did not express that obesity was an issue to them or pushed the blame to the metropolitan capital city of Lima (meaning the government), an area that several respondents had negative attitudes towards. Several respondents believed that Lima did not care about them, and felt that government policies did not benefit the demographics that so desperately need the government's attention.

Some of the non-governmental organizations (NGOs) and various health organizations were credited with much of the success of several health improvements, which is cause for praise as well as concern. The Red Cross had a major influence in the poorer areas by offering various educational programs, promoting and evaluating water safety in the markets, and helping children get their national identification numbers. Without these identification numbers, children do not have access to governmental programs and cannot attend school. When talking to the representative for the Red Cross in Iquitos, she noted several trends in children's size and health, stating that she noticed the biggest changes in how families live related to the education of mothers. Much of what the Red Cross chooses to incorporate in each community is based on the mothers' involvement as they have the biggest influence in the families due to their role in childrearing and food preparing. Even if a small number of mothers come to classes or programs, other mothers are still educated through brigades that each community forms and other women in the community are taught the lessons for that week or month.

In Mazán, the Municipality Program for Child Health works in a similar way as the Red Cross. They provide teaching for the community regarding handwashing, healthy food habits for various ages, and health during and after pregnancy. This program serves a similar demographic in Mazán as the Red Cross does in Iquitos, and for many of the same reasons. The Municipality Program is different in the fact that it serves women and children exclusively. Another aspect the Municipality Program does differently than the Red Cross is that if a mother does not show up to the classes, volunteers go out and find the woman and either bring her to class if she is able or teach her in her home. The Municipality volunteers try their best to ensure that education is spread throughout the community, especially to the mothers who need it.

One of the major recommendations the WHO has laid out in their updated plan of attack on childhood obesity is governmental policies and laws (WHO, 2016). Many respondents' attitudes towards their government were negative, and many do not have faith that they will receive any sort of aid because they are not a large metropolitan city such as Lima, Cuzco, or Machu Pichu. While NGO support is appreciated, the reliance of the government on such groups may be causing the delay in action as well as other factors including political instability and corruption.

LIMITATIONS AND IMPROVEMENTS

This field immersion was a small component of a larger travel/study experience and had several limitations. This was a convenience sample with a limited amount of time of three weeks to interview participants, resulting in a small sample size. Given more than three weeks, more participants could have been acquired to reflect a more accurate representation of each population. Most respondents were women, so incorporating more men in the study

would also offer a more accurate depiction of the perceptions of this area as a whole. Most respondents were also of lower socioeconomic status, so incorporating more participants from the middle and upper-class may yield different results given that it was observed that obesity largely affects those groups. Peru is a Spanish-speaking country, so interpreters were used during interviews. It is possible that information may have been lost in translation, which may have altered the results.

FUTURE RESEARCH

Following this study, other research studies need to be done, not only to get more accurate results depicting each population, but to understand why the people believe what they do. After determining more realistic perceptions, research into willingness to change dietary habits and/or activity level would need to be evaluated before implementation of any changes can be made.

Case studies following children of different communities, the urban, rural, and semi-urban, and socioeconomic classes may be done to see how living in different areas can affect the development of non-communicable diseases, including obesity, hypertension, diabetes, and heart disease. This would give a better idea of what effects each population, and different interventions may need to be implemented based on the area. For example, children in the city living in poverty may need better parent education, whereas a child of the same area in a higher socioeconomic class may just need more recess time in school.

While conducting this study, a cookbook was discovered by one of the NGOs that had tried to implement a better eating plan in at the clinic that serves the villages along the Orosa River. This cookbook, though available in Spanish, included fruits and vegetables exclusively, and most of them were not even available in the Amazon. After looking into

how receptive people are to a cookbook, developing one that included fruits and vegetables that were native to the area and also including fish in the recipes could potentially alleviate some of the malnutrition issues in the area.

CONCLUSIONS

Overall, the people in the surveyed areas do not perceive childhood obesity as an issue. There are some people within those communities that do perceive childhood obesity as an issue and want to make a change, but until the majority of the populations agrees, there can be no governmental change to combat the inevitable rise in childhood obesity rates.

Food availability and knowledge gaps play a huge role in what people choose to eat. In the rural areas, they were limited to what they could grow or catch, and limited resources, such as consistent electricity and clean water, greatly affected what they ate and how they prepared food. In some of the lower socioeconomic areas, many people did not know how what they ate affected their bodies, and many were accustomed to eating simply to survive. In all settings, fried or heavily salted foods were common, as it was difficult to cook any other way, and salt helped to preserve meat when refrigeration was unavailable. As noted earlier, the children in the rural areas may have better access to healthier options when compared to children in urban settings.

Government policies play an important role in what children eat and how they get their meals. In the areas where local governmental support is prominent, like Mazán, mothers and children have access to education and services that otherwise might not be provided. In Iquitos, the governmental support is there in the form of *Caliwarma*, but the NGOs are often the source for many, especially in the poorer parts of the city. There is no consistent

governmental support throughout the region, which makes it difficult for children to get the services they need.

Women also play a significant role in what children eat, and are a target for improving child health and education. As demonstrated by the Red Cross in Iquitos and the Municipality Program for Child Health in Mazán, healthy teaching is targeted towards women in the community due to their willingness to participate and implement teaching in their households.

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VITA

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